



NextEra Energy Canada, ULC

Construction Plan Report – East Durham Wind Energy Centre

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Glossary of Terms

ANSI.....	Area of Natural and Scientific Interest
DFO	Department of Fisheries and Oceans Canada
EIS	Environmental Impact Study
GE.....	General Electric
GIS.....	Geographic Information System
kV.....	Kilovolt
LLC	Limited Liability Company
m.....	Metre
MNR.....	Ontario Ministry of Natural Resources
MOE.....	Ontario Ministry of the Environment
MTCS.....	Ontario Ministry of Tourism, Culture and Sport
MTO.....	Ontario Ministry of Transportation
MW.....	Megawatt
NextEra	NextEra Energy Canada
O.Reg. 359/09	Ontario Regulation 359/09
PDR	Project Description Report
PSW.....	Provincially Significant Wetland
REA.....	Renewable Energy Approval
SGRA.....	Significant Groundwater Recharge Area
SVCA	Saugeen Valley Conservation Authority
The Project.....	East Durham Wind Energy Centre
ULC.....	Unlimited Liability Corporation

1. Introduction

East Durham Wind, Inc., a wholly owned subsidiary of NextEra Energy Canada, ULC (NextEra), is proposing to construct a wind energy project in the Municipality of West Grey, Grey County, Ontario. The Project will be referred to as the East Durham Wind Energy Centre (the “Project”) and will be located on private lands east of the Community of Durham and west of the Village of Priceville. The wind turbine technology proposed for this Project is the GE 1.6-100 model wind turbine. With a total maximum nameplate capacity of up to 23 MW, the Project is categorized as a Class 4 facility. Although NextEra has identified 16 locations for wind turbine siting, up to a total of 14 turbines are proposed to be constructed for the Project.

This *Construction Plan Report* was prepared in accordance with the requirements of the REA process outlined in Ontario Regulation 359/09 (O. Reg. 359/09) and the Technical Guide to Renewable Energy Approvals (Ontario Ministry of the Environment (MOE), 2011).

The following sections provide information on the construction and installation activities, potential negative environmental effects of construction and installation activities and mitigation measures for the identified negative effects.

1.1 Summary of Construction Plan Report Requirements

The requirements for the *Construction Plan Report* defined under *O.Reg. 359/09* are provided in the following table (**Table 1-1**) in addition to the corresponding report section.

Table 1-1 Adherence to Construction Plan Report Requirements

Requirement	Completed	Corresponding Section
Details of construction or installation activities	Yes	Section 2
The location and timing of any construction or installation activities for the duration of the construction or installation	Yes	Section 1.3 and Figure 2-1 Section 2.1
Any negative environmental effects that may result from construction or installation activities	Yes	Section 3
Mitigation measures in respect of any negative environmental effects	Yes	Section 3 and the Environmental Effects Monitoring Plan in the Design and Operation Report

1.2 The Proponent

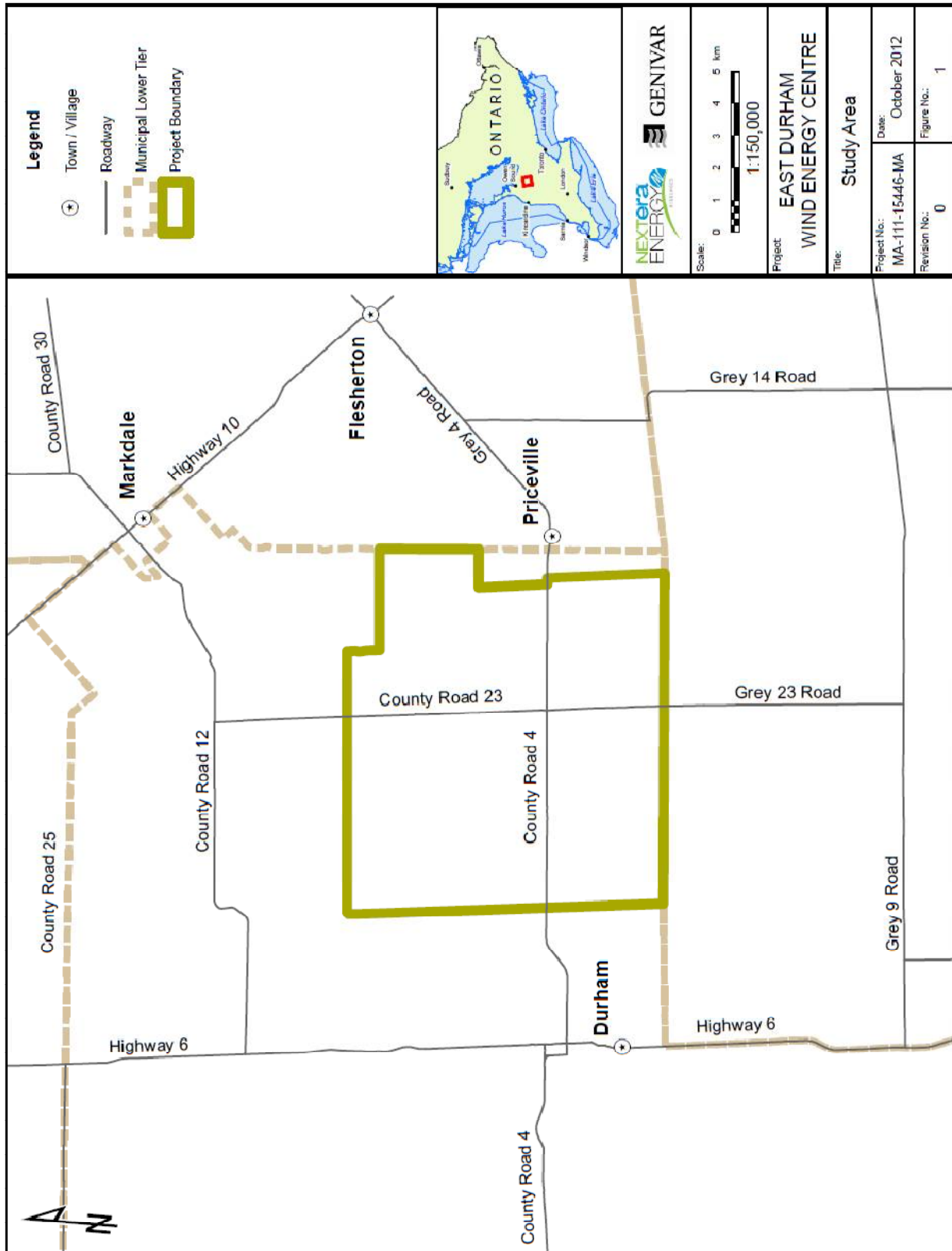
The Project will be owned and operated by East Durham Wind, Inc., a subsidiary of NextEra. NextEra’s parent company is NextEra Energy Resources, LLC, a global leader in wind energy generation with a current operating portfolio of 100 wind energy projects in North America. Wind farms currently owned and operated by NextEra Energy Canada include: Mount Copper and Mount Miller, (both 54 megawatts (MW) located in Murdochville, Quebec; Pubnico Point, (31 MW) located near Yarmouth, Nova Scotia; and Ghost Pine (82 MW), located in Kneehill County, Alberta.

The primary contacts for the project are as follows:

Project Proponent	Project Consultant
Derek Dudek Community Relations Consultant NextEra Energy Canada, ULC 390 Bay St, Suite 1720 Toronto, ON M5H 2Y2	Patricia Becker, MES Project Manager (Energy) GENIVAR Inc. 5 th Floor, 600 Cochrane Drive Markham, Ontario, L3R 5K3

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Figure 1-1 Study Area in Ontario



1.3 Project Study Area

The proposed Project is located in the Municipality of West Grey, east of the Community of Durham and west of the Village of Priceville within Grey County. The Project Study Area consists of the area being studied for the wind farm components (Wind Energy Centre Study Area). The Wind Energy Centre Study Area is generally bounded by:

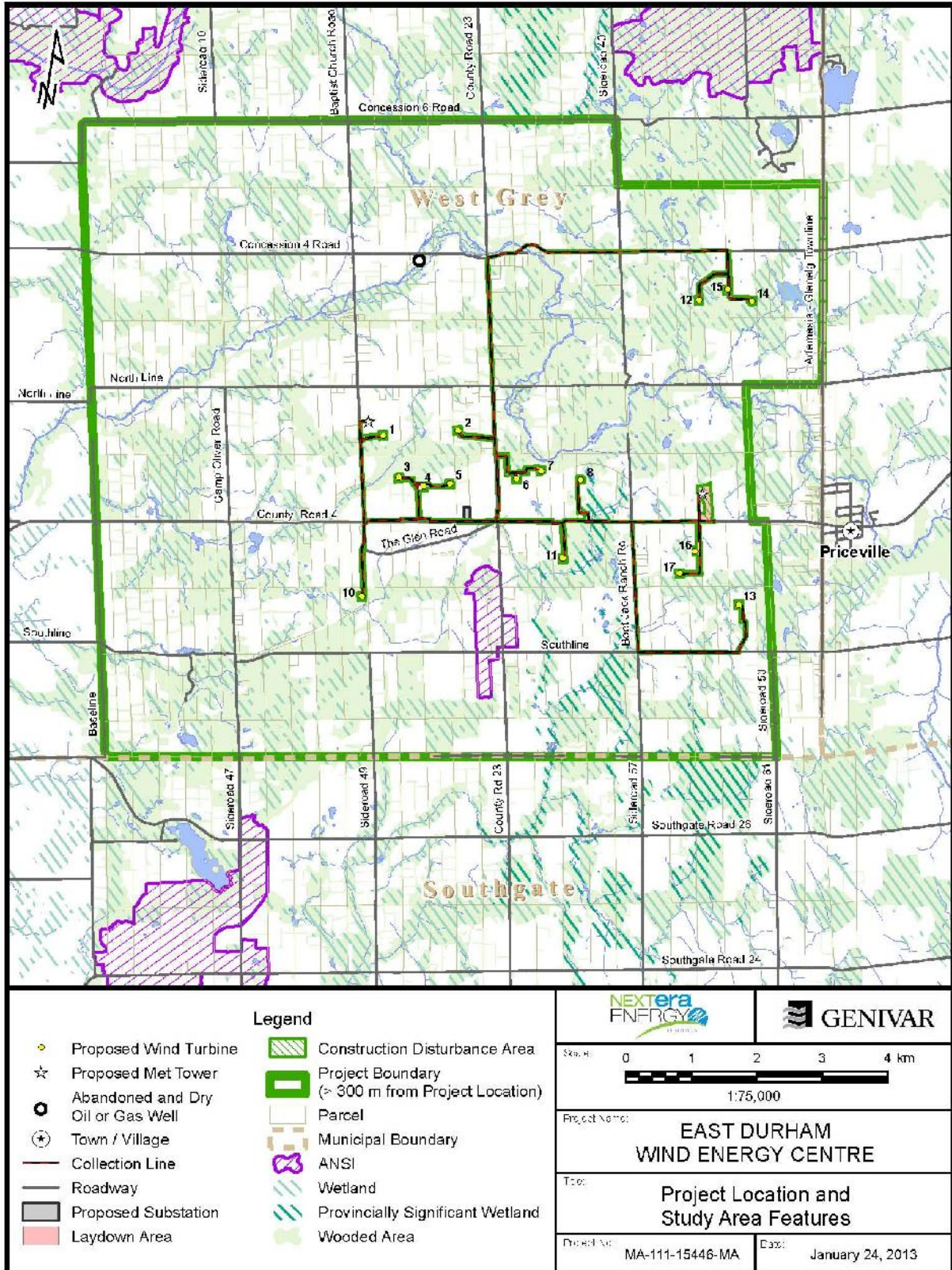
- Concession Road 6 to the north
- Sideroad 40, Townline Artemesia-Glenelg and Sideroad 50 to the east
- The West Grey – Southgate municipal boundary to the south
- Baseline to the west

The location of the Project 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. The Project Study Area was used to facilitate information collection.

The following co-ordinates define the external boundaries (corners) of the Project Study Area, as shown in **Figure 1-2**:

Study Area Corner	Easting NAD83 UTM17	Northing NAD83 UTM17
Northwest	517446	4898788
Northeast	528740	4899612
Southeast	529409	4890833
Southwest	519266	4889235

Figure 1-2 Project Location and Study Area Features



2. Description of Construction and Installation Activities

The Project Location is defined as per 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.

The proposed Project Location is shown on **Figure 2-1** and includes the major components of the Project listed below:

- Up to 16 GE model wind turbines (14 turbines are 1.6-100 models (1.62 MW), Turbine 6 is a 1.34-100 model (1.34 MW) and Turbine 2 is 1.39-100 model (1.39 MW); 16 wind turbine generator locations and pad mounted step-up transformers are proposed for permitting, though a maximum of 14 turbines and associated pad mounted step-up transformers will ultimately be constructed;
- Turbine laydown and storage areas (including temporary staging areas, crane pads and turnaround areas surrounding each wind turbine);
- Construction laydown area (including staging areas for construction materials, construction trailers and associated facilities and a temporary electrical service line to provide power to the construction trailers);
- Approximately 28.3 km of 34.5 kV underground electrical collection lines and ancillary equipment (e.g., above ground electrical junction boxes) to connect the turbines to the proposed transformer substation;
- Pad mounted 690 V/ 34.5 kV step up transformers located at or near the base of each turbine;
- A transformer substation to connect to the Hydro One distribution system;
- Overhead 44 kV line to connect the transformer substation to the Hydro One electrical grid;
- Approximately 13.8 km of turbine access roads;
- An operations and maintenance building (located outside the project location – shared use of land and building approved and currently operational for the Conestogo Wind Energy Centre); and
- One to two meteorological towers.

Disturbance Areas have been identified surrounding various Project components, which are depicted on the Project Location figure by the item “Project Location” in the legend. These denote areas where temporary disturbance during the construction phase may occur as a result of: temporary project component laydown and storage areas, crane pad construction, turbine turnaround areas and construction of access roads and electrical collection system. 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 pre-construction conditions.

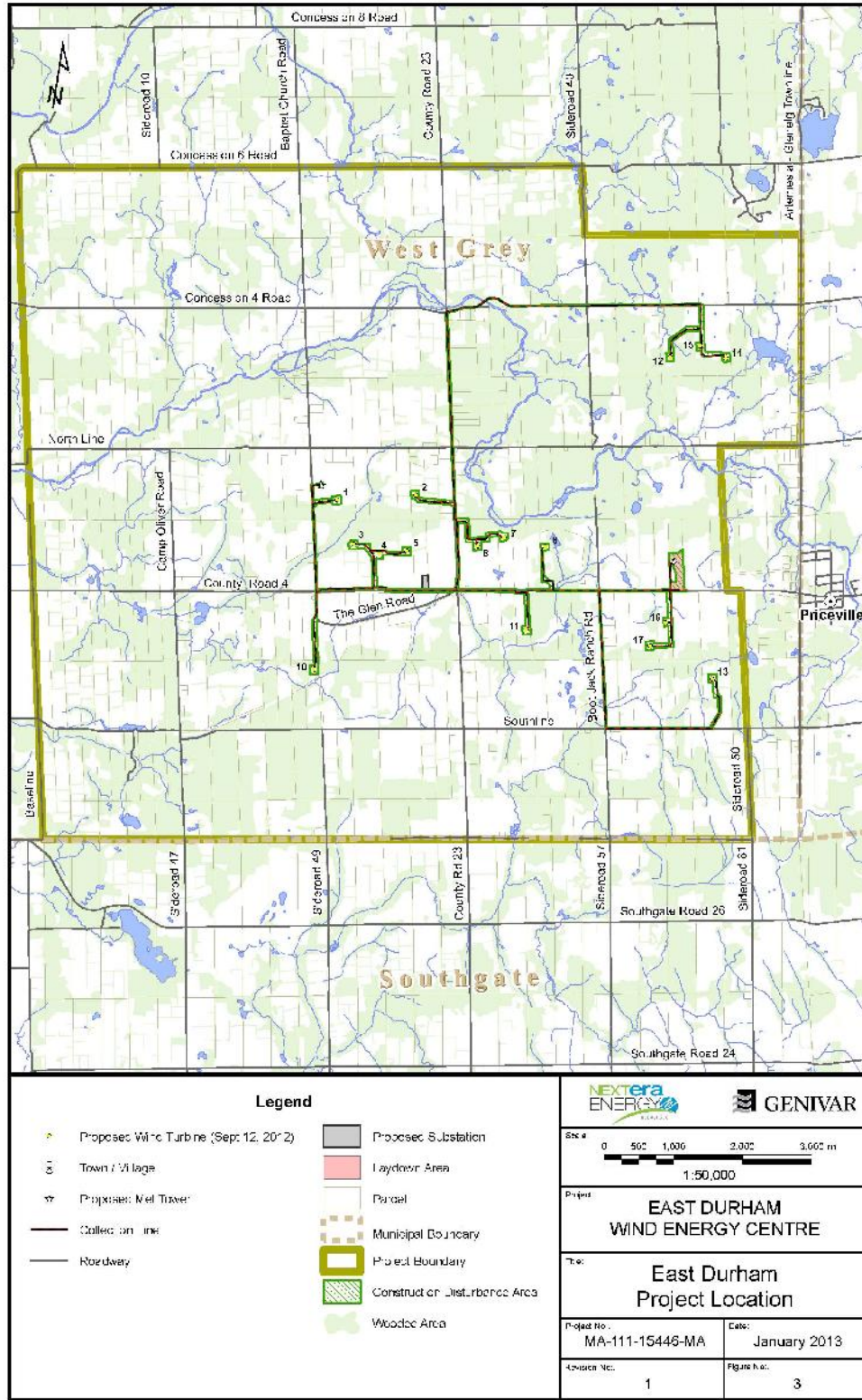
The above mentioned Project components are depicted in the Project Location figures described below:

- Figure 2-1: shows the locations of Project components including: wind turbines, access roads, the electrical collection system, the proposed transformer substation and temporary laydown/storage areas. This figure also shows topographical land contours and surface water drainage for all land within 120 m of the Project Location.
- Figure 1-2 above and further detailed Figures showing the location of Project components and at least 300 m (shown as the project boundary) surrounding the Project Location in relation to surrounding natural heritage and water body features such as: wetlands, woodlots, streams, and Areas of Natural and Scientific Interest, in addition to water wells identified in MOE’s database are provided in detail in the

Appendix C - Natural Heritage Assessment Reports. This figure also demonstrates compliance with the 120 m setback distance for natural heritage features, measured from the boundary of the Project Location, the 30 m setback distance for water bodies, measured from the Project Location boundary for turbines, and highlights significant natural heritage features that are within those setback distances.

- The Project components in relation to surrounding socio-economic features such as: property boundaries, roads, petroleum resources, and noise receptors are included in the Noise Study Report. This figure also identifies the setback distances between these features and the Project components. Note that noise compliance is addressed in **Appendix D – Noise Study Report.**

Figure 2-1 Project Location



The exercise of siting infrastructure is an iterative process that involves balancing the wind resource with environmental, socio-economic and engineering constraints, including the preferences of individual landowners while at the same time adhering to the setback distances prescribed by the Province and outlined in O. Reg. 359/09. Optimum turbine siting on individual properties was also determined in consultation with the landowner.

The following sections outline the activities anticipated for the Construction Phase of the Project and provide details on the timing of the activities, materials brought on site, construction equipment used, and temporary uses of land. Geotechnical studies will need to be completed to confirm whether water takings greater than 50,000 L/day are anticipated for the construction phase. Until the additional studies are completed, it is difficult to determine whether the water takings will exceed the limit. If the geotechnical studies identify the need for dewatering greater than 50,000 L/day then the impacts and mitigation measures identified in the potential effects tables will be addressed.

As noted in the potential effects tables (Table 3-5) and the Natural Heritage Assessment Report, additional work related to dewatering would be undertaken prior to construction. The additional work is related to surface water features since dewatering has the potential to reduce streamflow which could result in increased surface water temperatures from reduced groundwater contributions. In addition, the receiving waterbody may experience an increase in streamflows which could result in streambed and/or bank erosion and downstream sedimentation if dewatering is not managed properly. Best management practices can mitigate some of the potential impacts by controlling soil and water contamination during the dewatering process. As well there would be monitoring requirements during the dewatering process. The water level and streamflows at the proposed discharge locations would require monitoring and analyzing for general chemistry (temperature, pH, dissolved oxygen and conductivity), suspended solids, turbidity, nutrients and total metals. If dewatering is determined to be required, discussions with the MNR and MOE would be undertaken to further develop the dewatering program (including mitigation measures and monitoring requirements) based on the level of dewatering that is determined to be required.

These project activities are also described in Section 2.2.1 of the Project Description Report (PDR).

2.1 Project Timing

Subject to the receipt of the necessary permits and approvals, site work for the East Durham Wind Energy Centre is expected to begin in approximately October 2013 and last for approximately 6 months. **Table 2-1** presents the anticipated construction schedule and approximate order of construction activities for the proposed Project; although some construction activities will overlap.

Table 2-1 Construction Schedule

Activity	Timing of Activity	Duration	
Surveying	Prior to construction – preference is winter months	Less than 1 day per turbine location	
Geotechnical Sampling	Prior to construction – preference is winter months	One to two hours per turbine location	
Land Clearing and Construction of Access Roads	Summer, Fall or Winter	one to three days per access road to each turbine	
Installation of Culverts	Summer, Fall or Winter	One to two days per culvert	
Construction Laydown Area	Summer, Fall or Winter	One week	
Turbine Site and Crane Pad Construction	Summer, Fall or Winter	Two to four days per turbine location	
Delivery of Equipment	Throughout construction phase as needed, and in compliance with Traffic Management Plan	As needed throughout construction phase	
Turbine Foundations	Summer, Fall or Winter	Three to four days (excluding curing)	
Wind Turbine Assembly and Installation	Summer, Fall or Winter	Four to five days per turbine location	
Electrical Collector System	Pad Mount Transformers	Summer, Fall or Winter	Four to six days
	Collection Lines	Summer, Fall or Winter	Dependent upon the required length of the lines; however, between 4 and 8 km of collector lines can be installed in a week.

Transformer Substation Construction	Summer, Fall or Winter	15 – 20 weeks
Clean-up and Reclamation	Following turbine construction	Will be conducted as site is constructed
Turbine Commissioning	Summer, Fall or Winter	One to three days

2.2 Construction Activities

The proposed Project will consist of up to 16 GE model wind turbines (14 turbines are 1.6-100 models (1.62 MW), Turbine 6 is a 1.34-100 model (1.34 MW) and Turbine 2 is 1.39-100 model (1.39 MW); 16 wind turbine generator locations and pad mounted step-up transformers are proposed for permitting, though a maximum of 14 turbines and associated pad mounted step-up transformers will ultimately be constructed. The electricity generated from the wind turbines will be collected through a network of collection lines to an on-site transformer substation located on leased private land on Grey Road 4 (east of Boat Jack Ranch Road). A 44 kV electrical line will connect the transformer substation to the existing Hydro One 44 kV line (which is located on the south side of Grey Road 4). This electrical line will extend from the substation A-frame pull-off structure to the 44 kV line located along the south side of the municipal road right-of-way. This will include a number of poles on Grey Road 4 that the conductor strings across Grey Road 4. Turbine access roads along with laydown and storage areas (including temporary staging areas) are planned for the site. One to two permanent meteorological (weather monitoring) towers will be constructed on site.

2.2.1 Surveying and Geotechnical Study Activities

Surveys are required to locate the turbines, crane pads, access roads, temporary laydown area, electrical lines and the substation. Crews will drive light trucks to reach sites primarily using existing roads. They will then walk the site for the surveying and mark the locations using stakes. For the wind energy centre site, the surveys will typically take one to two days per turbine location.

Existing buried infrastructure located on public property will be identified using the Ontario One Call service and buried infrastructure located on private property will be identified by private contractors prior to construction and updated throughout construction, as required.

Geotechnical sampling will be required for turbine foundation locations. Typically a truck-mounted drill rig visits the sampling locations, drills the borehole and collects geotechnical information. This operation typically uses two operators and requires one to two hours per turbine location.

Equipment will include, at a minimum, trucks, a truck mounted drill rig, and possibly a track-mounted drill rig. The trucks will be driven to the site via existing municipal roads. No materials will be brought on site for these activities and any waste generated would be comprised of drill cuttings which will be scattered in the vicinity of the boreholes. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

2.2.2 Land Clearing and Construction of Access Roads

Access roads will be constructed to transport equipment to the construction sites. There will be a 60 m wide area for construction of the access roads. The access road will be sited within this area of disturbance in consultation with the landowner and taking into consideration potential environmental effects. Typically the access roads will be 11 m wide during the construction phase to accommodate the large cranes (with an additional 2 m clearance on each side for travel), and may be reduced in width following construction at the landowner's request. The road length will be different for each turbine according to its location.

The construction of the access road will typically require clearing and grubbing of any vegetation, excavation of the topsoil layer and adding a layer of compacted material to a typical thickness of 300 to 600 mm, depending upon site specific geotechnical conditions. Clean granular material (typically “A” or “B” gravel) will be brought to the site as needed and will not be stockpiled onsite. The topsoil will be kept and re-used on site. The access road to each turbine will typically require one to three days of construction time. Depending on the length of the access roads, construction may require approximately 25 truckloads of gravel.

New steel culverts may be required to maintain drainage in ditches at junctions with roadways and these will be constructed to support the construction equipment and delivery trucks. The location of proposed water crossings is summarized in the **Water Assessment and Water Body Report (Appendix E)** and the potential effects are described in detail below in Section 3. The exact details of culverts and their installation in addition to erosion control measures will be determined in conjunction with the Saugeen Valley Conservation Authority (SVCA) as part of their permitting process; however, the culverts are proposed to be open bottom and are proposed to be left in place following the operation phase, in consultation with the landowner.

Equipment will include, at a minimum, trucks, graders, and bulldozers. Municipal and provincial roads will also be used for transporting equipment, and minor modifications may be required to some of the existing roads (e.g., widening the turning radius) to handle the oversized loads. Any road damages will be repaired prior to the completion of the construction phase. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

2.2.3 Construction of Laydown Areas

An 8 hectare (22 acre) site will be constructed for the temporary storage of construction material. A portion of this site is proposed for the second Meteorological Tower (if required). The Construction laydown area will include staging areas for construction materials, construction trailers and associated facilities and a temporary electrical service line to provide power to the construction trailers. Following clearing and grubbing of any vegetation, the topsoil at the Construction Laydown Area will be removed and approximately 600 mm of clean compacted crushed gravel will be imported as needed. The excavated topsoil will be re-used on site as feasible. Construction activities are expected to last approximately one week and will require approximately 100 loads of gravel, and a crew of six people. Following the construction phase, the gravel will be removed from the site or re-used, to be determined in consultation with the landowner. The stockpiled topsoil will then be redistributed throughout the Temporary Laydown Area.

Equipment will include, at a minimum, trucks, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

2.2.4 Construction of Turbine Sites and Crane Pads

Prior to construction, the construction area will be cleared and grubbed. In order to provide sufficient area for the laydown of the wind turbine components and its assembly, a 122 m by 122 m square around the wind turbine must be cleared, levelled, and be accessible during the construction phase. The topsoil is typically removed and some soil stabilizing material (i.e., crushed gravel or clean back fill) may need to be added depending upon site specific geotechnical conditions. Where the site laydown areas are close to watercourses, erosion control measures will be implemented, as described below in Section 3.

Crane pads will be constructed at the same time as the road and will be located adjacent to the turbine locations. The crane pads will typically 15 m by 35 m in area. The topsoil at the crane pad will be removed and approximately 600 mm of clean compacted crushed gravel will be imported as needed. The excavated topsoil will be re-used on site as feasible. Once the turbine erection is complete, the crane pad will be removed and will be restored to prior use. The construction crew is anticipated to require four to six people and construction activities are expected to last for approximately one to two days.

Equipment will include, at a minimum, trucks, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

2.2.5 Delivery of Equipment

Equipment will be delivered by truck and trailer throughout the construction phase and stored at the temporary lay-down sites surrounding each turbine. A Traffic Management Plan will be developed and discussed with the Municipality of West Grey and Grey County. Alternative traffic routes will be prepared to address traffic congestion, as needed.

2.2.6 Construction of Turbine Foundations

A backhoe will be used to excavate an area approximately 3 m deep x 20 m x 20 m (precise size of excavation area to be determined by geotechnical analysis of the soil) with the material being stockpiled for future backfilling. Stockpiled material will have topsoil and subsoil separated out and surplus excavated material will be removed from the site for disposal in an approved manner. The foundation, with an approximate footprint of 400 m², will be constructed of poured concrete and reinforced with steel rebar to provide strength. The construction timeframe for turbine foundations is three to four days, excluding curing time. After construction the foundation will be backfilled and the surface will be landscaped for drainage. The only surface evidence of the foundation will be a small protrusion of concrete to which the tower is attached; as such land can be cultivated to within a few metres of the turbine. Any wood-waste generated will be removed from the site and recycled unless the landowner otherwise directs. Spent welding rods will be disposed of as hazardous waste by a licensed contractor.

Typical construction equipment, on a per turbine basis, will include:

- Excavator for removing material;
- Flatbed trucks (four to six) for delivery of rebar, turbine mounting assembly and forms;
- Truck mounted crane or rough terrain forklift for unloading and placement of rebar and forms;
- Concrete trucks for delivery of concrete (30-40 loads);
- Construction trucks (three to four vehicles with multiple visits); and
- Dozer, loader and trucks to backfill and compact foundation and remove surplus excavated materials.

The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

2.2.7 Wind Turbine Assembly and Installation

Turbine components will arrive on-site using flat bed and other trucks and will be temporarily stored on-site in the immediate vicinity of the base prior to assembly. Typically two cranes will be used to install the turbines. The larger crane is usually a crawler type with a capacity of 400 tonnes or larger, and is used for the higher lifts.

Clearing and grubbing will be required for the erection area. The erection cranes and crew will follow the foundation crew and erect the wind turbines once the foundations are completed and the concrete has set. This will typically be in five lifts (three for the towers, one for the nacelle and one for the rotor) over a period of two to three days. The lower tower sections may be installed several days before the upper tower sections and the turbine to optimize installation sequence. The lower tower section will also include electrical and communications equipment. Total turbine assembly and installation will typically require four to five days for each turbine. Fifteen to twenty people may be required at the site during the turbine installation; they will be transported using light duty vehicles.

Packing frames for the turbine components are returned to the turbine vendor. Following commissioning, the surrounding area will be returned to its original use.

Equipment will include, at a minimum, trucks, two cranes, graders, and bulldozers. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The larger track mounted crane can move from turbine site to turbine site; however, it will need to be disassembled to move it along roadways and from the Project site. Alternatively, cranes may be moved between turbine sites without disassembly along crane paths. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

2.2.8 Construction of Electrical Collector System

The electrical collector system will consist of pad mounted transformers, underground cabling for use on private property and a buried collection system running along turbine access roads and municipal road right-of-ways. These components are described below.

- **Pad Mount Transformers:** A concrete transformer pad, approximately 2.2 m by 2.5 m in size, will be installed adjacent to each turbine at the same time as the turbine base installation. The construction will consist of excavation, soil storage, installation of the buried electrical grounding grid, installation of the concrete pad, installation of the transformer, and electrical connections. Transformer installation and cabling between the turbine and transformer is expected to take three days per turbine. Equipment will include flatbed trucks to transport the equipment to site, and a truck-mounted crane for the installation. These activities will likely require four to six trucks, a work force of two people per vehicle per day, and will last between four to six days.
- **Collection Lines:** Cables and fibre optics lines (for communications) from each turbine to the transformer substation will be buried and will be located on private property adjacent to the turbine access roads, where feasible and in the municipal road right-of-way when necessary. Above ground electrical junction boxes will be installed where necessary to connect sections of the underground cabling. The excavated soil will be stored temporarily and then reused as backfill. Power conductors will be approximately 0.9 m below grade and the location will be marked. Farming practices will not be affected by the underground cabling due to the depth of the cables and location of the cable beneath the access roads. Equipment will include trenchers or diggers (depending on soil type) and construction will require a crew of six people. The construction timeframe is dependent upon the required length of the lines.

The collection line will cross the Saugeen River on Concession 4. It was determined that the river crossing was not suitable for underground cables due to the presence of bedrock in the location. The collection line is now proposed to be connected to the underside of the bridge structure. If the collection line cannot be attached to the bridge structure the alternative proposed is an overhead line with likely one pole on either side of the river (within the existing road right-of-way) with the collection line becoming an underground cable on either side of the crossing of the river.

- **Horizontal Directional Drilling:** Electrical cables may need to be installed using horizontal directional drilling to minimize effects to woodlots or watercourses. Erosion control devices will be installed at the drill location and drill cuttings will be collected and removed from the site for disposal in an approved and appropriate manner. An entrance and exit pit will be excavated on either side of the feature to be bored under. The directional drilling equipment will be set up at the entrance pit and a drill bit attached to rod segments is advanced until it reaches the exit pit. A slurry of bentonite and/or polymer mixed with water will be injected into the hole while drilling to help stabilize the bore hole and reduce friction. Once the drill bit has reached the exit pit the drill bit will be removed and a “reamer” attached and pulled back through the hole to enlarge the bore by 120-150%. The electrical cable will then be installed through the hole. Equipment will include a directional drilling rig and two to three support trucks to carry drilling rods, drilling supplies and cable.

The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment, and the polymer used for directional drilling. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

2.2.9 Construction of Electrical System

A 44 kV electrical line will connect the transformer substation to the existing Hydro One 44 kV line (which is located on the south side of Grey Road 4). This electrical line will extend from the substation A-frame pull-off structure to the 44 kV line located along the south side of the municipal road right-of-way. This will include a number of poles on the south side of Grey Road 4 that the conductor strings across Grey Road 4. The poles are proposed to be constructed of wood, concrete or steel and will be between 18 and 30 m tall.

Holes for new hydro poles are typically augured in the ground using a truck mounted auger device. The poles will then be inserted using special cranes to a typical depth of 2 to 3 m below grade. The poles are typically “dressed” (made ready to accept conductors) on the ground prior to installation. Typically, one crew will install the poles dress them in one day. Once the poles are in place and dressed, cables will be strung in place using boom trucks and special cable reel trucks. Some packing-material waste may be generated. All recyclable materials will be separated from non-recyclable materials and both streams will be removed from the site and disposed of at an approved and licensed facility.

The interconnection plan for any wind energy centre is subject to study, design and engineering by the Integrated Electricity System Operator which manages the Province’s electricity grid, Hydro One which owns the transmission lines, the local distribution company and the Ontario Energy Board, which regulates the industry through the Transmission System Code and the Distribution System Code.

Equipment will include, at a minimum, a truck mounted crane, flatbed trailers and a truck mounted auger. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment. A lubricant is likely to be used when the cables are pulled in through the conduit. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

2.2.10 Construction of Transformer Substation

Approximately two hectares in size, the transformer substation will include an isolation switch, a circuit breaker, a step-up power transformer, transmission switch gear, instrument transformers, grounding and metering equipment and a control housing which will be supplied with power from the local distribution line. Substation grounding will meet the Ontario Electrical Safety Code. The substation area will be gravelled with clean material imported to the site on an as needed basis and sloped to facilitate drainage. A secondary containment system will be installed around the transformer in the event of an oil leak to prevent any soil contamination.

During construction of the substation, topsoil and subsoils will be stripped and stockpiled separately. Stripped topsoil and subsoil will be placed in the temporary storage facility area and topsoil stripped from the substation area will be distributed on other Project properties. An electrical service line of approximately 9 m and associated poles will likely be connected to the existing distribution line adjacent to the substation for the purpose of providing house service power to the substation control building. The construction crew will consist of approximately 25-40 people and is expected to last for about four months. Some packing-material waste may be generated. All recyclable materials will be separated from non-recyclable materials and both streams will be removed from the site and disposed of at an approved and licensed facility.

Construction equipment will include small trenchers, a small crane, forklifts, concrete trucks and a bulldozer. The trucks and graders will be driven to the site and the bulldozers will be transported via trailers. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment and transformer oil. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

2.2.11 Construction of Operation and Maintenance Building

An operations building will be located outside of the project study area and will be on privately held lands or an existing suitable structure will be purchased/leased for the purpose of monitoring the day-to-day operations of the wind energy centre and supporting maintenance efforts. The East Durham Wind Energy Centre plans to use the land and building for the Operations and Maintenance building that was already permitted under a separate REA and is now operational for the Conestogo Wind Energy Centre. This shared use of the building will have low use (approximately 2 people) and will not change or result in additional mitigation measures being required.

2.2.12 Permanent Meteorological Towers

One to two permanent meteorological towers will be installed at the Project. These are typically up to 80 m in height and use either a monopole or lattice structure installed using a drill truck. The towers will consist of a tube-type structure with a poured concrete foundation, and will support wires which extend outward from the tower structure at specified height intervals or be a monopole with no support wires. The towers will be erected using winches and secured with three guy wires that extend approximately 45 m to 50 m from the mast centre and are tied off to anchors or a small monopole foundation. The minimum footprint to contain the guy anchors would be a 122 m box, but when the tower is tilted-down for maintenance the tower would extend past this by 18 m, there is usually crop damage incurred during a tilt-down. There is some equipment involved during installs/tower tilts which is a light duty truck, 5 m trailers, all terrain vehicles and skid steers. No significant soil or vegetation disturbance is anticipated. Construction of the meteorological towers will take approximately two days and require a crew of six people.

Permanent meteorological towers are an operational requirement of the Independent Electricity System Operator (IESO) as an electricity market participant (this includes all generators of electricity) and allow the IESO to operate the system reliably and safely.

2.2.13 Clean-up and Reclamation

Site clean-up will occur throughout the construction phase and site reclamation will occur after construction has been completed. Waste and debris generated during the construction activities will be collected by a licensed operator and disposed of at an approved facility. All reasonable efforts will be made to minimize waste generated and to recycle materials including returning packaging material to suppliers for reuse/recycling.

Stripped soil will be replaced and re-contoured in the construction areas and disturbed areas will be re-seeded, as appropriate. Erosion control equipment will be removed once inspections have determined that the threat of erosion has diminished to the original land use level or lower. High voltage warning signs will be installed at the transformer substation and elsewhere, as appropriate. At the conclusion of construction, vehicles and construction equipment will be removed from the site.

2.2.14 Turbine Commissioning

Turbine commissioning will occur once the wind turbines and substation are fully installed and Hydro One is ready to accept grid interconnection. The commissioning activities will consist of testing and inspection of electrical, mechanical and communications systems. Some packing-material waste may be generated. All recyclable materials will be separated from non-recyclable materials and both streams will be removed from the site and disposed of at an approved and licensed facility.

Temporary portable generator sets may be used to electrically commission the turbines prior to connection to the grid. The generators are required for approximately one day per turbine. The generators are supplied with a Certificate of Approval to the owners. Following the commissioning phase, the portable generators will be removed from the site and returned to the owners.

Equipment will include support trucks which will be driven to the construction site. The only chemicals required for this phase are oils, gasoline, and grease used to operate construction equipment and portable generators, gearbox oil, and lubricants. Fuel-handling will be conducted in compliance with the mitigation measures outlined below in Section 3.

3. Description of Environmental Effects and Mitigation Measures

The following section describes potential effects associated with the construction and installation of the Project, in addition to mitigation measures and monitoring commitments that will be made to minimize these potential effects. The potential effects described below are also presented in Section 3 of the PDR.

For each potential negative effect, performance objectives were developed to describe a desired outcome of mitigation. Next, mitigation measures were proposed to achieve the performance objectives. Residual effects, which are those effects that remain following the application of mitigation measures and monitoring commitments, were then assessed based on professional judgment as well as previous Project experience. Where possible, the significance of residual adverse effects has been described based on the following:

Magnitudethe size or degree of the effect compared against baseline conditions; and

Likelihoodthe probability that the effect will occur.

Finally, where monitoring commitments were identified, they are intended to verify that the mitigation measures achieve performance objectives. Should the monitoring reveal that the mitigation measures are not achieving the intended result, the identified contingency measures would then be implemented.

This description of effects was completed for all 16 turbines and associated infrastructure shown on the Project Location figures. Note that ultimately, 14 turbines will be constructed, resulting in a conservative assessment of effects. Where other REA reports provide further details on potential environmental effects and proposed mitigation, these reports are noted.

3.1 Cultural Heritage

Archaeological Assessment

The Stage 1 was conducted by Archaeological Services Inc. and was completed in 2009 and revised in December 2010. The Stage 1 was submitted to MTCS on December 23, 2010 and a letter of concurrence on the recommendation to conduct Stage 2 archaeological assessments was received on January 14, 2011 from MTCS.

The Stage 2 archaeological assessment was conducted by Golder Associates Ltd. between May and December 2012. The goal of the Stage 2 archaeological assessment was to determine whether any archaeological resources existed within the Project Location that would be impacted by the construction of the turbines or any related Project infrastructure.

Golder first performed an initial field condition check within the Project Location to assess the visibility of the land parcels and the archaeological field work required. Once all ploughed agricultural fields associated with the proposed Project Location were deemed to have at least 80% ground visibility and had been sufficiently weathered pedestrian surveys were undertaken. The proposed Project Location on these fields was assessed by archaeologists spaced at 5 metre intervals scanning the ground surface for any exposed artifacts that could serve as evidence of human activity anywhere from 10,000 years ago until the late 19th century A.D.

Portions of the Project Location that could not be ploughed, such as in a woodlot, were test pitted by archaeologists spaced at five metre intervals. Archaeologists dug 30 centimetre in diameter test pits into the subsoil (usually a depth of 15 to 25 centimetres) every five metres apart and screened all soil through six millimetre hardware mesh to recover any artifacts.

Finally any areas deemed to be poorly drained, steeply sloped or disturbed by recent construction and therefore of low archaeological potential were photo documented as part of the Stage 2 archaeological assessment.

During the course of this field work three archaeological sites were documented (during the pedestrian survey; no sites were documented during the test pit survey). A sample of artifacts from each site was collected and subsequently analyzed. The three sites were determined to be 19th century historic Euro-Canadian sites that have been recommended for subsequent Stage 3 archaeological assessment prior to construction.

The substation location and associated access road change was proposed late in 2012 and the new locations required completion of a Stage 2 Archaeological Assessment to confirm whether archaeological material or sites were present. In addition, it was proposed in late 2012 that the electrical collection line crossing of the Saugeen River on Concession 4 may need to consist of one overhead line. These two modifications required a Stage 2 archaeological assessment on the additional lands. This was conducted in September 28, 2012 (related to substation location change) and November 20, 2012 (related to the Saugeen River crossing on Concession 4). Following completion of the Stage 2 archaeological assessment it was found that no archaeological material or sites were identified and no further archaeological assessment was required for either of these areas.

The findings and all Stage 2 archaeological field work have been documented in the Stage 2 Archaeological Assessment report and the Stage 2 Archaeological Assessment Additional Lands report. The Stage 2 Archaeological Assessment Reports were submitted to MTCS for review and acceptance into the Ontario Public Register of Archaeological Reports. Sign-off on the Stage 2 work was received on December 20, 2012 for the additional lands and on January 22, 2013 for the original Stage 2 and these letters confirm that: (1) the Ministry is satisfied with the recommendations in the reports; and, (2) the fieldwork and reporting for the archaeological assessment was consistent with the Standards and Guidelines for Consultant Archaeologists (2011).

Cultural Heritage Assessment

A Cultural Heritage Assessment was completed to address built heritage and cultural heritage landscape resources related to the Euro-Canadian land use in the area dating prior to 1970. Fieldwork was conducted on August 22 and 23 and on several days in early September 2012. Landscape features and built features were evaluated using the criteria for determining cultural heritage value or interest, from the Ontario Heritage Act, Ontario Regulation 9/06. The Ontario Heritage Act, its Regulations and the Ontario Heritage Toolkit were consulted for this project, in addition to O. Reg. 359/09 of the Environmental Protection Act.

There are no properties or buildings designated as heritage properties/protected properties, nor are any properties within the project area currently recognized for their heritage or cultural value by the Municipality of West Grey, or the Ontario Heritage Trust. None of the properties are, or have ever been, on any heritage list.

As part of the assessment, 181 built features were considered, along with 28 landscape features. Of these, 49 features (42 built and 7 landscape) were screened as having potential cultural heritage value or interest using the criteria in Regulation 9/06 of the Ontario Heritage Act.

The impacts of the project on the landscape features will be very limited. The location of the turbines is a minimum of 500 metres away from any of the landscape features and the impact will be minimal. The access roads will not have any impact on any of the identified features. The electrical collection lines will be buried and will have no impact on the identified landscapes.

The McKechnie Cemetery is located on property adjacent to the proposed location of the laydown area and the second proposed meteorological tower. Since the laydown area will only be utilized during the construction phase

and then will be removed, any impacts will only be short term. Although the meteorological tower (if constructed) is located on the lot adjacent to the McKechnie Cemetery, it is sufficiently far from the cemetery that it will have little or no impact.

The impact of the proposed project on the built heritage features will also be very limited. The location of the turbines is a minimum of 400 metres away from any of the built features and in most cases substantially more. The impact will be minimal. The electrical collection lines will be buried and will have no impact on the identified built heritage features. Overall there are no built heritage features that will be impacted by the development of the East Durham Wind Energy Centre.

There is one mitigation measure that is recommended. The laydown area is adjacent to the McKechnie Cemetery and will be in operation during the construction phase. It is recommended that after construction is completed and the laydown area is no longer required, that the area be returned to its pre-construction condition or better. There are no further recommendations with respect to the heritage impact assessment of the proposed project.

This report was submitted to the MTCS for review on September 19, 2012 and the report amended on December 4, 2012 (to incorporate modification of the substation location). Sign-off from the Ministry regarding confirmation on whether the report is satisfactory and concurrence with the recommendations was received on December 18, 2012.

3.1.1 Potential Effects

Potential effects from construction and installation activities are as follows:

- Disturbance or displacement of 3 archaeological sites (determined to be 19th century historic Euro-Canadian sites) identified through the Stage 2 Archaeological Assessment due to construction of project infrastructure.
- Visual impact on the McKechnie Cemetery due to use of the adjacent property as a temporary laydown area during construction.

No effects to protected properties or heritage resources are anticipated, as the Project Location was selected to avoid these features.

3.1.2 Mitigation Measures, Residual Effects and Monitoring Plan

Table 3-1 provides mitigation measures, residual effects and the monitoring plan for each potential effect identified above.

Table 3-1 Mitigation Measures, Residual Effects and Monitoring Plan: Cultural Heritage

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
Disturbance or displacement of 3 archaeological sites (i.e., historic Euro-Canadian sites) identified through Stage 2 Assessment due to construction of project infrastructure.	<ul style="list-style-type: none"> • Avoid disturbance/ loss of archaeological sites 	<ul style="list-style-type: none"> • Install a fence a minimum of 20 m from the site boundaries to protect it from adjacent construction activities and then enact the monitoring plan; or • Conduct Stage 3 archaeological assessment, document findings in Stage 3 assessment report, and submit report to Ministry of Tourism, Culture and Sport 	<ul style="list-style-type: none"> • Disturbance or displacement of archaeological resources avoided or minimized through application of mitigation measures. • Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> • Retain a licensed archaeologist to monitor any construction activities within a 50 m monitoring zone for an archaeological resource surrounded by a 20 m buffer where a Stage 3 archaeological assessment has been recommended. Submit a report to MTCS detailing the results of any monitoring activities. • Retain a licensed archaeologist to

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
		(MTCS) for approval. Any potentially interested Aboriginal communities will be contacted, as appropriate, from at least this point onward. <ul style="list-style-type: none"> If Stage 4 archaeological assessment is recommended based on the outcome of the Stage 3 assessment: <ul style="list-style-type: none"> Install a fence a minimum of 10 m from the site boundaries to protect it from adjacent construction activities and then enact the monitoring plan; or Conduct Stage 4 archaeological assessment, document findings in Stage 4 assessment report, and submit report to MTCS for approval. 		monitor any construction activities for Stage 4 avoidance close to the 10 m buffer area fenced off that may affect archaeological resources. <ul style="list-style-type: none"> Contingency Measures: <ul style="list-style-type: none"> Cease work immediately should previously unidentified archaeological resources be discovered during the construction phase. The area will be secured and a licensed archaeologist contacted to conduct further archaeological work. Construction will only resume in the location when any archaeological assessment has been completed. Any potentially interested Aboriginal communities will be contacted, as appropriate. Cease work immediately should human remains be found during construction, and contact the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.
Visual impact on the heritage values of the McKechnie Cemetery.	<ul style="list-style-type: none"> Minimize visual impact on heritage resource 	<ul style="list-style-type: none"> Return portion of laydown area adjacent to the Cemetery to its pre-construction condition or better. 	<ul style="list-style-type: none"> No effect as a result. 	<ul style="list-style-type: none"> None required.

3.2 Natural Heritage

Effects to natural heritage features; including significant wetlands, woodlots, wildlife habitat, and valleylands are identified in the Natural Heritage Assessment Report which was prepared based on the *Natural Heritage Assessment Guide for Renewable Energy Projects*. The potential effects, mitigation measures, net effects and monitoring commitments regarding the natural heritage features, in addition to birds and bats, are evaluated in the Natural Heritage Assessment Report and the Environmental Effects Monitoring Plan and were submitted to the Ontario Ministry of Natural Resources (MNR) for review and sign-off. Sign-off from the MNR confirming the report is satisfactory was received on December 10, 2012 for the original Natural Heritage Assessment Reports and January 8, 2013 for the report that addressed the proposed project modifications.

Following the completion of the Records Review and Site Investigation for all natural heritage features located within 120 m of the Project Location, an Evaluation of Significance was conducted to identify any features that required an Environmental Impact Study (EIS).

Table 3-2 and **Figures 1-2** and **2-1** document the significant natural heritage features located within 120 m of the Project Location for which an EIS was conducted.

Table 3-2 Summary of Natural Features Carried Forward to the EIS

Feature	Natural Features Carried Forward to EIS
Wetlands	The following eleven (11) wetland units or wetland complexes were treated as significant and carried forward to the EIS: <ul style="list-style-type: none"> • WE-01, WE-02, WE-03, WE-04, WE-05, WE-06, WE-07, WE-08, WE-09, WE-12 and WE-13.
Woodlands	The following four (4) woodlands were determined to be significant or treated as significant and therefore carried forward to the EIS: <ul style="list-style-type: none"> • WO-02, WO-03, WO-04 and WO-05.
Valleylands	The following seven (7) valleyland features were determined to be significant and therefore carried forward to the EIS: <ul style="list-style-type: none"> • VA-01, VA-02, VA-03, VA-04, VA-05, VA-06 and VA-07.
Significant Wildlife Habitat	<p>The following candidate significant wildlife habitats were confirmed within the 120 m Area of Investigation and within 120 m of qualifying project infrastructure, and were therefore carried forward to the EIS.</p> <p>Features evaluated and determined to be significant:</p> <ul style="list-style-type: none"> • Three (3) Turtle Wintering Areas (WH-TW-01, WH-TW-04 and WH-TW-05); • Three (3) Bat Maternity Colony (WH-BMA-005, WH-BMA-006 and WH-BMA-007); • One (1) Deer Yarding Area (WH-DYA-01); • Four (4) Amphibian Woodland Breeding Habitats (SWH-ABWO-01, SWH-ABWO-02, SWH-ABWO-03, SWH-ABWO-04); • One (1) Marsh Bird Breeding (WH-MBB-12); • One (1) Waterfowl Nesting Area (WH-WN-08) • Three (3) Habitat for Species of Special Concern (Snapping Turtle and Generalized Significant Wildlife Habitat); • One (1) Colonial Nesting Breeding Bird Habitat – tree/shrub (WH-CNTS-13); and • One (1) Amphibian Wetland Breeding Habitat (WH-ABWE-01). <p>The following types of habitat were addressed as Generalized Significant Wildlife Habitat and were treated as significant and carried forward to the EIS:</p> <ul style="list-style-type: none"> • Milksnake • Waterfowl Stopover and Staging (aquatic); • Colonial-Nesting Bird Breeding Habitat (ground); • Colonial Nesting Bird Breeding Habitat (tree/shrub); • Seeps and Springs; • Amphibian Breeding Habitat (wetlands) • Shrub/Early Successional Bird Breeding Habitat/Declining Guild Shrubland Birds • Terrestrial Cray fish • Deer Movement Corridors • Bald Eagle and Osprey Nesting, Foraging and Perching Habitat; • Turtle Nesting Areas

3.2.1 Potential Effects

3.2.1.1 Generalized Candidate Significant Wildlife Habitat

The features containing generalized candidate significant wildlife habitat are identified above in the table called *Summary of Natural Features Carried Forward to the EIS*. The potential effects from construction and installation activities on generalized candidate significant wildlife habitat are outlined in Table 3-3.

3.2.2 Mitigation Measures, Residual Effects and Monitoring Plan

3.2.2.1 Generalized Candidate Significant Wildlife Habitat

Table 3-3 provides mitigation measures, residual effects and the monitoring plan for Generalized Candidate Significant Wildlife Habitat potential effects identified above.

3.2.2.2 *Significant Wetlands, Woodlands, Valleylands and Wildlife Habitat:*

Table 3-4 provides Feature/Unit specific mitigation measures, residual effects and the monitoring plan for each potential effect identified in section 3.2.1.2. Note that at all locations described below, the best management practices and mitigation measures outlined in the Generalized Candidate Significant Wildlife Habitat table will be applied. The features containing significant wetlands, woodlands, valleylands and wildlife habitat are identified above in the table called *Summary of Natural Features Carried Forward to the EIS*. The potential effects from construction and installation activities on these features include those discussed above under Generalized Candidate Significant Wildlife Habitat and additional potential effects as outlined below in Tables 3-3 and 3-4.

Table 3-3 Mitigation Measures, Residual Effects and Monitoring Plan: Significant Wildlife Habitat

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Wildlife WH – TW -01 WH – TW -04 WH – TW -05 Turtle Wintering	Construction and Decommissioning of Turbine 8 and associated access road. Installation of electrical collection within the road right of way.	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Potential for silt/sediment to enter into aquatic feature; • Incidental mortality of turtles moving between over-wintering ponds and other areas due to access road or turbine construction. • Barrier to turtles as a result of road or turbine construction. • Changes to surface water drainage patterns resulting from access road construction causing indirect effects on Turtle Over-wintering Habitat Features. • Potential for release of contaminants from construction vehicles. 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Develop and implement an erosion and sediment control plan before commencement of construction, ensure effective implementation of the plan with additional measures implemented as required for effect prevention of overland transport of silt and sediment. • Fence area as far from pond and as close to collection line as possible during maintenance activities. • Education of operations staff to be aware during C/D activities in proximity to this feature in May, June, September or October. • No clearing within habitat in May, June, September or October. • Maintain speed limits of vehicles near over-wintering pond. • Conduct area searches prior to beginning construction activities. • Ensure roads and other structures are at grade to allow movement overtop by turtles. • Ensure no grade changes within catchment area of ponds that would affect hydroperiods; • If surface drainage alterations are detected, undertake corrective measures to restore drainage pattern. • Ensure a plan is in place to address potential fuel or other deleterious substance spills and ensure vehicle refueling and storage of fuels occurs away from sensitive features. 	<p>Construction/Decommissioning Monitoring:</p> <ul style="list-style-type: none"> • Conduct regular site inspections and monitoring of sediment and erosion controls where construction occurs within 30m of a feature, ensure construction best management practices are followed, by a designated on-site Environmental Monitor(s). • Monitoring schedule should include weekly visits during construction, prior to and post large rainfall events or significant snow event, daily during extended events and monthly during inactive construction periods and prior to stabilization of soils. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • Notify MOE’s Spills Action Centre for any spills. • Assess and remediate affected soils and water. • Ensure that additional sediment and erosion controls are available and on-site should additional controls be required, as identified by Environmental Monitor. <p>Monitoring:</p> <ul style="list-style-type: none"> • Inspect locations within 30m of wintering habitat following completion of access roads to ensure no grade changes.
Wildlife WH –DYA-01	Construction or decommissioning of collection line.	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Collection cable will be either attached 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • No construction between December 	<p>Construction/Decommissioning Monitoring:</p> <ul style="list-style-type: none"> • No additional monitoring or

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Deer Yarding Area		<p>to the bridge or directional drilled across watercourses at the Concession 4 at WH-DYA-01;</p> <ul style="list-style-type: none"> Construction or decommissioning activities may include vehicle movement (trucks/small size drill rig) and personnel moving in and around the watercourse crossings associated with the habitat; It is anticipated that some construction commotion will result with either directional drilling and or attaching the collection cable to the bridge structure; Construction commotion may serve to scare deer away from the area or to alter deer behaviour; Construction commotion may affect deer movement into and out of the deer yard or staging; and Activities of humans can have significant effect on deer (late winter is a sensitive time when energy reserves are at the lowest levels). 	<p>1st and April 15th when the snow depth is greater than 20cm or there is evidence of yarding. In years where environmental conditions are not favorable for yarding, MNR will be contacted to determine if construction activities may proceed within this timing window;</p> <ul style="list-style-type: none"> Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental vegetation damage within deer wintering areas; Place deer-crossing signs along access roads that are found within 30m of a deer wintering area to inform motorists of the potential for deer presence, and maintain signs for the life of the project; Control vegetation areas within 30m of access roads to reduce collisions within winter feeding areas; If any vehicle collision with deer is noted along access roads, chain-link fence will be installed between the habitat and any access road within 30m to minimize the potential for vehicle mortalities; and, Vegetation removal should be avoided wherever feasible and especially during winter months 	<p>contingency measures required.</p>
Wildlife SWH – ABWO-01 SWH – ABWO-02 SWH – ABWO-03 SWH – ABWO-04 Amphibian Woodland Breeding	<p>Access Road to Turbine 8 Access Road to Turbines 6 and 7. Electrical collection route. Construction of access road and turbine base to</p>	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> Mortality and/or disturbance to amphibians due to vegetation removal/soil grading Potential for silt/sediment to enter into aquatic feature; Potential to cause barrier to animal movement corridors; Potential to change surface water drainage patterns or obstruct lateral flows to wetlands or aquatic features. Changes to surface water drainage 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> Avoid construction in areas that would cause a barrier to animal movement between upland and breeding habitat; Schedule vegetation removal outside of breeding season for amphibians: <ul style="list-style-type: none"> <i>Salamanders – March 15 to April 30th or as determined through consultation with MNR Midhurst District Offices;</i> <i>Frogs- April 1 to June 30th or as determined through consultation</i> 	<p>Construction/Decommissioning Monitoring:</p> <ul style="list-style-type: none"> Conduct regular site inspections and monitoring of sediment and erosion controls where construction occurs within 30m of a feature, ensure construction best management practices are followed, by a designated on-site Environmental Monitor(s). Monitoring schedule should include weekly during

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
	<p>Turbine 17. Construction of access road to Turbine 12</p> <p>Construction of access road to Turbine 14.</p> <p>Construction of access road that surround Turbine 12.</p> <p>Construction of access road to Turbine 8.</p>	<p>patterns resulting from access road construction causing indirect effects on habitat.</p> <ul style="list-style-type: none"> • Potential for release of contaminants from construction vehicles. 	<p>with MNR Michurst District Offices ;</p> <ul style="list-style-type: none"> • Develop and implement an erosion and sediment control plan before commencement of construction, ensure effective implementation of the plan with additional measures implemented as required for effect prevention of overland transport of silt and sediment. • Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. For construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e., heavy duty silt fencing, straw bales). • Keep sediment and erosion control measures in place until disturbed areas have been stabilized (i.e., re-vegetated). • Schedule grading within 30 m of a watercourse or wetland to avoid times of high runoff volumes (spring and fall), wherever possible. Temporarily suspend work if high runoff volume is noted or excessive flows of sediment discharges occur until mitigation measures are in place; • Avoid intersection of wildlife movement corridors. • Ensure no grade changes within catchment area of ponds that would affect hydroperiods; • If surface drainage alterations are detected, undertake corrective measures to restore drainage pattern. • Ensure a plan is in place to address potential fuel or other deleterious substance spills and ensure vehicle refueling and storage of fuels occurs away from sensitive features. 	<p>construction, prior to and post large rainfall events or significant snow event, daily during extended events and monthly during inactive construction periods and prior to stabilization of soils.</p> <p>Contingency Measures:</p> <ul style="list-style-type: none"> • Notify MOE's Spills Action Centre for any spills; • Assess and remediate affected soils and water. • Ensure that additional sediment and erosion controls are available and on-site should additional controls be required, as identified by Environmental Monitor. • Inspect locations within 30m of breeding habitat following completion of access roads to ensure no grade changes. <p>Contingency Measures</p> <ul style="list-style-type: none"> • If surface water drainage alterations are detected undertake corrective measures to restore pre-development drainage patterns. • Where vegetation removal is required, a restoration plan/edge management plan should be developed. <p>Monitoring:</p> <ul style="list-style-type: none"> • Monitoring of the plan for up to two years post-construction. <p>Contingency measures:</p> <ul style="list-style-type: none"> • Replace failed plantings, institute controls of invasive species if required.

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Wildlife WH-WN-08 Waterfowl Nesting	Construction and decommissioning of Turbine 11 and associated access road and underground electrical collection	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Potential for disturbance to breeding activity as a result of construction activities such as noise, vehicular movement and the presence of people; • Potential for silt or sediment to enter the feature as a result of grading; • Changes to surface water drainage patterns resulting from access road construction causing indirect effects on habitat. • Potential for release of contaminants from construction vehicles; • No vegetation removal is proposed for within the feature or within the adjacent contiguous vegetation communities. 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Adherence to the timing window for breeding birds (May 1 to July 31) or as based on consultation with MNR and/or Environment Canada) for project activities • If nest searches are required, they will be conducted by a biologist • Develop and implement an erosion and sediment control plan before commencement of construction • Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. For construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e., heavy duty silt fencing, straw bales). • Delineate area to ensure there is no encroachment into habitat • Keep sediment and erosion control measures in place until disturbed areas have been stabilized (i.e., re-vegetated with native species). • Ensure no grade changes within catchment area of ponds that would affect hydroperiods; • If surface drainage alterations are detected, undertake corrective measures to restore drainage pattern. • Ensure a plan is in place to address potential fuel or other deleterious substance spills and ensure vehicle refueling and storage of fuels occurs away from sensitive features. 	<p>Performance Objectives, Monitoring and Contingency Plans</p> <p>Construction/Decommissioning Monitoring:</p> <ul style="list-style-type: none"> • Conduct regular site inspections and monitoring of sediment and erosion controls where construction occurs within 30m of a feature, ensure construction best management practices are followed, by a designated on-site Environmental Monitor(s). • Monitoring schedule should include weekly site visits during construction, prior to and post large rainfall events or significant snow event, daily during extended events and monthly during inactive construction periods and prior to stabilization of soils. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • Notify MOE's Spills Action Centre for any spills. • Assess and remediate affected soils and water. • Ensure that additional sediment and erosion controls are available and on-site should additional controls be required, as identified by Environmental Monitor. <p>Monitoring:</p> <ul style="list-style-type: none"> • Inspect locations within 30m of wintering habitat following completion of access roads to ensure no grade changes. <p>Contingency Measures</p> <ul style="list-style-type: none"> • If surface water drainage alterations are detected undertake corrective measures to restore pre-development drainage patterns.

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Wildlife WH – MBB-12 Marsh Bird Breeding	Construction of access road to Turbine 8 (surrounding Turbine 8).	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Potential for disturbance to breeding activity as a result of construction commotion such as noise, vehicular movement and the presence of people; • Potential for silt or sediment to enter the feature as a result of grading; • Changes to surface water drainage patterns resulting from access road construction causing indirect effects on habitat. • Potential for release of contaminants from construction vehicles; • No vegetation removal is proposed for within the feature or within the adjacent contiguous vegetation communities. 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Adherence to the timing window for breeding birds (May 1 to July 31 or as based on consultation with MNR and/or Environment Canada) for project activities • Develop and implement an erosion and sediment control plan before commencement of construction • Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. For construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e., heavy duty silt fencing, straw bales). • Keep sediment and erosion control measures in place until disturbed areas have been stabilized (i.e., re-vegetated). • Demarcate area to ensure there is no encroachment into habitat. • Ensure no grade changes within catchment area of ponds that would affect hydroperiods; • If surface drainage alterations are detected, undertake corrective measures to restore drainage pattern. • Ensure a plan is in place to address potential fuel or other deleterious substance spills and ensure vehicle refueling and storage of fuels occurs away from sensitive features. 	<p>Construction/Decommissioning Monitoring:</p> <ul style="list-style-type: none"> • Conduct regular site inspections and monitoring of sediment and erosion controls where construction occurs within 30m of a feature, ensure construction best management practices are followed, by a designated on-site Environmental Monitor(s). Monitoring schedule should include weekly during construction, prior to and post large rainfall events or significant snow event, daily during extended events and monthly during inactive construction periods and prior to stabilization of soils. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • Notify MOE's Spills Action Centre for any spills. • Assess and remediate affected soils and water. • Ensure that additional sediment and erosion controls are available and on-site should additional controls be required, as identified by Environmental Monitor. <p>Monitoring:</p> <ul style="list-style-type: none"> • Inspect locations within 30m of wintering habitat following completion of access roads to ensure no grade changes. <p>Contingency Measures</p> <ul style="list-style-type: none"> • If surface water drainage alterations are detected undertake corrective measures to restore pre-development drainage patterns.

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
<p>Wildlife WH –BMA-005 WH –BMA-006 WH –BMA-007 Bat Maternity Colony</p>	<p>Construction of Turbine 10. Construction of Turbine 16. Construction of access road and underground electrical collection line.</p>	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Potential impacts to bat habitats by accidental damage to, or permanent removal of vegetation, including tree limbs • Potential impacts to bat habitats from noise disturbance and/or avoidance behaviour during construction • Avoidance caused by lighting 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to potentially significant bat roosting trees. • Prepare a tree preservation plan which identifies specific trees to be removed and whether each tree contains a cavity suitable for potential use as a bat maternity colony. • Cavity tree removal will occur outside of the maternity and summer swarming period of May 15 to August 31, wherever possible. If this is not possible, MNR will be consulted regarding any additional mitigation measures that may be required. • Construction is to take place outside of the May 1 to July 31 roosting period for this habitat. If this is not possible MNR will be consulted regarding any additional mitigation measures that may be required. • For each suitable cavity tree to be removed, a bat house will be installed in the remainder of the woodland for each of the affected habitats. • No clearing or habitat restoration to occur May 1st-July 31st to avoid disturbing natural bat processes. If this is not possible MNR will be consulted regarding any additional mitigation measures that may be required. • Noise disturbance impacts are expected to be minimal, and temporary, in nature, and no specific mitigation measures have been determined necessary. • Signage indicating presence of a significant feature beyond construction barriers will be posted. • Construction personnel will be educated about the location and 	<p>Construction/Decommissioning Monitoring:</p> <ul style="list-style-type: none"> • Include T10, T11 among turbines selected for post-construction mortality monitoring, to be conducted as outlined in the EEMP. • Access cannot be gained for two of these habitats, therefore no pre-construction or post-construction behaviour/disturbance monitoring will occur within BMA-005 or BMA-006. <p>Monitoring for BMA-007:</p> <ul style="list-style-type: none"> • Conduct post-construction monitoring of this feature for 1 year after construction, following pre-construction methods, if this feature is deemed significant. • If this first year of post-construction monitoring indicates that this feature may no longer be significant, an additional 2 years of post-construction monitoring will occur following pre-construction methods. • If a significant habitat is still significant after the first year of post-construction monitoring, no further monitoring will occur as the habitat will be considered to be unaffected. <p>Contingency Measure for BMA-007:</p> <ul style="list-style-type: none"> • If a permanent disturbance has been noted within this wildlife habitat, the MNR will be contacted to determine whether additional mitigation measures will be needed

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Wildlife WH-ABWE-01 Amphibian Wetland Breeding Habitat	Construction and Decommissioning of Access Road.	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Mortality and/or disturbance to amphibians due to vegetation removal/soil grading • Potential for silt/sediment to enter into aquatic feature; • Potential to cause barrier to animal movement corridors; • Potential to change surface water drainage patterns or obstruct lateral flows to wetlands or aquatic features. • Changes to surface water drainage patterns resulting from access road construction causing indirect effects on habitat. • Potential for release of contaminants from construction vehicles. 	<p>significance of this feature.</p> <ul style="list-style-type: none"> • Daily visual monitoring of work area to ensure compliance. • Revegetation of areas cleared with native plants and reseeding will occur as soon as possible in the growing season • Propose a lighting scheme that will minimize potential risk to bat collisions while fulfilling Transport Canada requirements <p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Schedule vegetation removal outside of breeding season for amphibians: <i>Salamanders – March 15 to April 30th or as determined through consultation with MNR Midhurst District Offices;</i> • <i>Frogs- April 1 to June 30th or as determined through consultation with MNR Midhurst District Offices ;</i> • Work within 30m of amphibian habitat will not occur after dusk during the breeding season (April-June) • Demarcate areas for construction to ensure activities remain outside of habitat • Develop and implement an erosion and sediment control plan before commencement of construction, ensure effective implementation of the plan with additional measures implemented as required for effect prevention of overland transport of silt and sediment. • Keep sediment and erosion control measures in place until disturbed areas have been stabilized (i.e., re-vegetated with native seed). • Avoid construction in areas that would cause a barrier to animal movement between upland and breeding habitat; Avoid intersection of wildlife movement corridors • Schedule grading within 30 m of a 	<p>Construction/Decommissioning Monitoring:</p> <ul style="list-style-type: none"> • Conduct regular site inspections and monitoring of sediment and erosion controls where construction occurs within 30m of a feature, ensure construction best management practices are followed, by a designated on-site Environmental Monitor(s). • Monitoring schedule should include weekly site visits during construction, prior to and post large rainfall events or significant snow event, daily during extended events and monthly during inactive construction periods and prior to stabilization of soils. • Inspect locations within 30m of breeding habitat following completion of access roads to ensure no grade changes. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • Notify MOE's Spills Action Centre for any spills; • Assess and remediate affected soils and water. • Ensure that additional sediment and erosion controls are available and on-site should additional controls be required, as identified by Environmental Monitor.

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Wildlife WH-CNTS-13 (Colonial Nesting Bird Breeding Habitat)	Construction and Decommissioning of Access Road	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Potential for disturbance to breeding activity as a result of construction activities such as noise, vehicular movement and the presence of people 	<p>watercourse or wetland to avoid times of high runoff volumes (spring and fall), wherever possible. Temporarily suspend work if high runoff volume is noted or excessive flows of sediment discharges occur until mitigation measures are in place.</p> <p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • <i>No construction is to occur during the heron breeding season of March 1 to August 1.</i> If this is not possible MNR will be consulted regarding any additional mitigation measures that may be required. • Ensure staff working in the area is aware of habitat and sensitivity. • Ensure construction best management practices are followed, by a designated on-site Environmental Monitor(s) to reduce disturbance caused by noise. • Limit speeds of construction vehicles using road to 30km/h. 	<ul style="list-style-type: none"> • If surface water drainage alterations are detected undertake corrective measures to restore pre-development drainage patterns. <p>Construction/Decommissioning Monitoring:</p> <ul style="list-style-type: none"> • Ensure construction best management practices are followed, by a designated on-site Environmental Monitor(s) to reduce disturbance caused by noise. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • Contact MNR
Wildlife WH-SSC-ST-01 Species of Special Concern – Snapping Turtle	Construction, Decommissioning of Turbine 8 and access road.	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Incidental mortality of turtles moving between over-wintering ponds and other areas due to access road construction; • Barrier to turtle movement as a result of construction fencing, roads or other structures; • Changes to surface water drainage patterns resulting from access road construction causing indirect effects on Turtle Over-wintering Habitat Features. 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Fence area as far from pond and as close to transmission line as possible during construction/decommissioning activities. • Maintain speed limits of vehicles near pond habitat. • Ensure no grade changes within catchment area of ponds that would affect hydroperiods; • If surface drainage alterations are detected, undertake corrective measures to restore drainage pattern. 	<p>Construction/Decommissioning Monitoring:</p> <ul style="list-style-type: none"> • Conduct regular site inspections and monitoring of sediment and erosion controls where construction occurs within 30m of a feature, ensure construction best management practices are followed, by a designated on-site Environmental Monitor(s). • Monitoring schedule should include weekly during construction, prior to and post large rainfall events or significant snow event, daily during extended events and monthly during inactive construction periods and prior to stabilization of soils. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • Notify MOE's Spills Action Centre for any spills.

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Wildlife WH-SSC-ST-02 WH-SSC-ST-03 Species of Special Concern – Snapping Turtle	Construction of collection line within the road right of way.	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Potential for disturbance to breeding activity as a result of construction commotion such as noise, vehicular movement and the presence of people; • Potential for silt or sediment to enter the feature as a result of grading; • Changes to surface water drainage patterns resulting from access road construction causing indirect effects on habitat. • Potential for release of contaminants from construction vehicles; • No vegetation removal is proposed for within the feature or within the adjacent contiguous vegetation communities. 	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Adherence to the timing window for breeding birds (May 1 to July 30 or as based on consultation with MNR and/or Environment Canada) for project activities • Develop and implement an erosion and sediment control plan before commencement of construction • Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. For construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e., heavy duty silt fencing, straw bales). • Keep sediment and erosion control 	<p>Performance Objectives, Monitoring and Contingency Plans</p> <ul style="list-style-type: none"> • Assess and remediate affected soils and water. • Ensure that additional sediment and erosion controls are available and on-site should additional controls be required, as identified by Environmental Monitor. <p>Monitoring:</p> <ul style="list-style-type: none"> • Inspect locations within 30m of wintering habitat following completion of access roads to ensure no grade changes. <p>Contingency Measures</p> <ul style="list-style-type: none"> • If surface water drainage alterations are detected undertake corrective measures to restore pre-development drainage patterns. <p>Monitoring:</p> <ul style="list-style-type: none"> • No additional monitoring or contingency measures required.
		<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> • Adherence to the timing window for breeding birds (May 1 to July 30 or as based on consultation with MNR and/or Environment Canada) for project activities • Develop and implement an erosion and sediment control plan before commencement of construction • Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. For construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e., heavy duty silt fencing, straw bales). • Keep sediment and erosion control 	<p>Construction/Decommissioning</p> <p>Monitoring:</p> <ul style="list-style-type: none"> • Conduct regular site inspections and monitoring of sediment and erosion controls where construction occurs within 30m of a feature, ensure construction best management practices are followed, by a designated on-site Environmental Monitor(s). Monitoring schedule should include weekly during construction, prior to and post large rainfall events or significant snow event, daily during extended events and monthly during inactive construction periods and prior to stabilization of soils. <p>Contingency Measures:</p>	

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
			<p>measures in place until disturbed areas have been stabilized (i.e., re-vegetated).</p> <ul style="list-style-type: none"> • Ensure no grade changes within catchment area of ponds that would affect hydroperiods; • If surface drainage alterations are detected, undertake corrective measures to restore drainage pattern. • Ensure a plan is in place to address potential fuel or other deleterious substance spills and ensure vehicle refueling and storage of fuels occurs away from sensitive features. 	<ul style="list-style-type: none"> • Notify MOE's Spills Action Centre for any spills. • Assess and remediate affected soils and water. • Ensure that additional sediment and erosion controls are available and on-site should additional controls be required, as identified by Environmental Monitor. <p>Monitoring:</p> <ul style="list-style-type: none"> • Inspect locations within 30m of wintering habitat following completion of access roads to ensure no grade changes. <p>Contingency Measures</p> <ul style="list-style-type: none"> • If surface water drainage alterations are detected undertake corrective measures to restore pre-development drainage patterns.

Table 3-4 Mitigation Measures, Residual Effects and Monitoring Plan: Significant Candidate Wildlife Habitat

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Wetland 1 WE-01 WE-02 WE-03 WE-04 WE-05 WE-06 WE-07 WE-08 WE-09 WE-12 WE-13	Construction and Decommissioning of Turbines, Access Roads, Overhead Electrical and Underground Collection (applies to all wetlands where these components are within 120m).	<ul style="list-style-type: none"> Increased dust accumulation on peripheral wetland vegetation, causing damage to wetland plants resulting from construction of access roads where the minimum 5 m setback from dripline will be applied to Significant Wetland Features. Intrusion resulting in damage to vegetation. Potential for silt/sediment to enter into aquatic feature. Increased erosion and sedimentation resulting from clearing and grubbing, excavation, backfilling and stockpiling. Potential to change surface water drainage patterns or obstruct lateral flows to wetlands or aquatic features as a result of access road construction, operation and maintenance causing indirect effects on habitat. Soil/water contamination resulting from accidental spills. Soil / water contamination by oils, gasoline, grease and other materials (e.g., turbine lubricant, maintenance personnel) resulting from turbine operation and maintenance, substation operation and maintenance. Unplanned intrusions into significant wetlands in event of equipment malfunction due to directional drilling and risk of sedimentation or erosion into significant wetlands when directionally drilling. Potential introduction of invasive species into Significant Wetlands communities resulting from access road operation and maintenance. Incidental mortality/roadkill of amphibians from operational vehicle movement and disturbance from routine 	<ul style="list-style-type: none"> Use of water as a dust suppressant along areas where construction is located within 5 m of a significant wetland. Install protective fencing around vegetation to prevent accidental damage. Develop and implement an erosion and sediment control plan before commencement of construction; Utilize erosion blankets, siltation bags, etc. For construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e., heavy duty silt fencing, straw bales). Keep sediment and erosion control measures in place until disturbed areas have been stabilized (i.e., re-vegetated). Schedule grading within 30 m of a watercourse or wetland to avoid times of high runoff volumes (spring and fall), wherever possible. Temporarily suspend work if high runoff volume is noted or excessive flows of sediment discharges occur until mitigation measures are in place. Ensure no grade changes within catchment area of ponds that would affect hydroperiods. Ensure Best Management Practices are used to maintain current drainage patterns. If surface drainage alterations are detected, undertake corrective measures to restore drainage pattern. Control quantity and quality of stormwater discharge using best management practices, and implement infiltration techniques to the extent possible (e.g., 	<p>Monitoring:</p> <ul style="list-style-type: none"> Daily monitoring of areas where active construction is occurring within 5 m of a significant wetland by Environmental Monitor. <p>Contingency Measures:</p> <ul style="list-style-type: none"> If dust accumulation on wetland plants occurs, spray down plants with water. <p>Monitoring:</p> <ul style="list-style-type: none"> Undertake monthly site inspections to ensure that protective fencing is intact and that there is no damage caused during construction. <p>Contingency Measures:</p> <ul style="list-style-type: none"> In the event that trees are damaged during construction, damaged trees should be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. <p>Monitoring:</p> <ul style="list-style-type: none"> Monitor on-site conditions (i.e., erosion and sediment control, spills, flooding, etc.) where construction occurs within 30 m of a feature on the following basis: <ul style="list-style-type: none"> Weekly during active construction periods; Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (i.e., spring freshet); Daily during extended rain or

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
		<p>maintenance.</p> <ul style="list-style-type: none"> • Increase in impervious surfaces from presence of turbine foundation and access roads, resulting in increased water temperatures, and surface runoff. • No potential negative effects anticipated from operation of underground collection. 	<p>use of a permeable surface for access roads, replanting of vegetation).</p> <ul style="list-style-type: none"> • Develop and implement an emergency spills plan outlining steps to contain any chemicals and avoid contamination of adjacent wetland features. As part of this plan, "frac-out" provisions will be provided. • Control soil / water contamination through Best Management Practices. • Ensure machinery arrives on site in a clean, washed condition and is maintained free of fluid leaks. • Develop a spill response plan outlining steps to contain any spills during maintenance activities to avoid contamination of wetland features. Train staff on associated procedures and maintain emergency spill kits on site. • Dispose of any waste material from maintenance activities by authorized and approved off-site vendors. • Site maintenance, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features including water bodies and significant woodlands, wetlands, and wildlife habitat. • Implement vehicle and equipment cleaning procedures and practices to minimize or eliminate the discharge of pollutants from vehicle / equipment cleaning operations to watercourses or natural areas. • Store any stockpiled materials away from natural features to prevent deleterious substances from inadvertently discharging to the environment. • Only apply herbicides (if required) when wind speeds are low and no significant precipitation is expected (does not apply to agricultural practices). • Only use herbicides (if required) approved for use adjacent to water bodies, riparian buffers, or woodland edges (does not 	<p>snowmelt periods;</p> <ul style="list-style-type: none"> • Monthly during inactive construction periods, where the site is left alone for 30 days or longer. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place. <p>Monitoring:</p> <ul style="list-style-type: none"> • Daily monitoring of areas where active construction is occurring within 5 m of a significant wetland by Environmental Monitor. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • If surface water drainage alterations are detected, undertake corrective measures to restore drainage patterns. <p>Monitoring:</p> <ul style="list-style-type: none"> • Conduct daily inspections of construction equipment for leaks / spills. • Conduct regular site inspections and monitoring of turbines by a designated on-site Environmental Monitor. • Implement contingency measures in the event of a spill. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • In the event of a spill, immediately stop all work until the spill is cleaned up; • Install a spill collection pad for refuelling and maintenance; • Notify MOE's Spills Action Centre of any leaks or spills; • Assess and remediate affected soils and water by using spill kit kept on site;

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
			<p>apply to agricultural practices).</p> <ul style="list-style-type: none"> Implement infiltration techniques to the maximum extent possible. Maintain 30 m setback from significant wetlands and woodlands, where possible or a minimum 5 m setback (measured from the dripline of trees or wetland edge if trees are absent). Adhere to all setback requirements from significant wetlands. Install sediment and erosion control fencing along edge of wetland if within 30 m as per Ontario Provincial Standard Specifications (OPSD 219.130). Where feasible, wetland crossings will be within existing right-of-ways adjacent to wetland areas. Where features cannot be avoided, crossings will be completed via horizontal directional drilling as per O. Reg. 359/09. Locate entrance and exit pits at least 30 m from feature edge. Install protective fencing around vegetation to prevent accidental damage. Ensure drill depth is at an appropriate depth below wetland to reduce the risk of a “frac-out”. Restore drilling sites to pre-construction conditions once construction is complete. A restoration plan should be implemented to re-vegetate the 5 m buffer between the turbine and wetland. This should include the 1 year application of an approved herbicide to eradicate invasive species followed by the cultivation and seeding of the area with a native seed mix as well as the planting of native shrubs along the edge consistent with existing wetland vegetation composition. Maintain low speed limits of vehicles on access roads. Ensure speed limits for maintenance vehicles are posted and adhered to; Advise operations staff to avoid driving 	<ul style="list-style-type: none"> For spills near wetlands, analyze water samples for general chemistry (e.g., temperature, pH, dissolved oxygen, and conductivity), suspended solids, turbidity, nutrients and total metals (e.g., copper, iron, zinc and aluminum). In the event that a spill occurs, the details of the spill will be reported back to MOE, including a description of any assessment and remediation undertaken Monitor daily to ensure proper cleanup is completed. <p>Monitoring:</p> <ul style="list-style-type: none"> Inspect locations within 30 m of wetlands following completion of access roads to ensure no grade changes. <p>Contingency Measures:</p> <ul style="list-style-type: none"> If surface water drainage alterations are detected, undertake corrective measures to restore drainage patterns. <p>Monitoring:</p> <ul style="list-style-type: none"> Monitor twice per year for two years to confirm survival of seed mix. <p>Contingency Measures:</p> <ul style="list-style-type: none"> Should seed mix and/or plantings not survive, additional seeding and/or plantings will be undertaken. 8-12 No additional monitoring required.

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Woodland WO-02 WO-03 WO-04 WO-05	Construction and Decommissioning of Turbines, Access Roads, Overhead transmission and Underground Collection (applies to all woodlands where these components are within 120m).	<p>Construction/Decommissioning</p> <ul style="list-style-type: none"> Loss of vegetation associated with significant woodlands as a result of tree removal or significant pruning at woodlot edges. Accidental damage due to unintentional vehicle intrusions into woodland. Increased erosion and sedimentation resulting from clearing and grubbing, excavation, backfilling and stockpiling in proximity to woodlands or within woodlands. Alteration of overland or lateral flows to woodlands. Disturbance to woodland function as habitat for local and resident wildlife (non-SWH function). Soil/water contamination resulting from accidental spills. 	<p>roads or undertaking maintenance activities in proximity to these features at night between April 1st and June 30th, and any rainy nights from spring to early autumn, wherever possible.</p> <ul style="list-style-type: none"> Minimize paved surfaces and design roads to promote infiltration. <p>Construction/Decommissioning</p> <ul style="list-style-type: none"> Remove trees by hand-held equipment and drag them out of the natural area to minimize soil disturbance. Limit edge tree disturbance (measured from the dripline) and pruning through field fit alterations to construction limits. Lighter vehicles and lighter machinery should be used in and around the natural area. Any vehicles used within the natural area should have wide-based tires. Tracked vehicles should be avoided. Re-vegetate disturbed areas as soon as possible after construction activities are complete using species native to Ontario in naturally vegetated areas. Limit size of machines entering significant woodlands to minimize soil compaction. Fence construction limits and ensure limits of construction are adhered to Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. For construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e., heavy duty silt fencing, straw bales. Ensure no grade changes within catchment area of ponds or forests that would affect hydroperiods. If surface drainage alterations are detected, undertake corrective measures to restore drainage pattern. Control soil / water contamination through Best Management Practices. 	<p>Construction/Decommissioning Monitoring</p> <ul style="list-style-type: none"> Conduct post-planting inspection of planted compensation area to determine success of establishment (may be undertaken by partner organization). survival monitoring is to occur within years 1, 2 and 5 following the planting. The target survival rate at the end of year 5 is 60%. <p>If this target is not met, the proponent will fund refill plantings designed by qualified professional or a recognized planting delivery agent to ensure that the target survival is met</p> <p>Contingency Measures:</p> <ul style="list-style-type: none"> If plantation is not establishing for any number of reasons, conduct silvicultural intervention including, but not limited to: fill planting, cleaning, re-planting or thinning (may be undertaken by partner organization). If new edge is not establishing for any number of reasons, conduct silvicultural intervention including but not limited to: fill planting, cleaning, re-planting or thinning. <p>Monitoring:</p> <ul style="list-style-type: none"> Monitor on-site conditions (i.e., erosion and sediment control, spills, flooding, etc.) where construction occurs within 30 m

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
			<ul style="list-style-type: none"> Develop a spill response plan outlining steps to contain any spills during maintenance activities to avoid contamination of valleyland features. Train staff on associated procedures and maintain emergency spill kits on site. Ensure machinery arrives on site in a clean, washed condition and is maintained free of fluid leaks. Dispose of any waste material from maintenance activities by authorized and approved off-site vendors. 	<p>of a feature on the following basis:</p> <ul style="list-style-type: none"> Weekly during active construction periods; Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (i.e., spring freshet); Daily during extended rain or snowmelt periods; Monthly during inactive construction periods, where the site is left alone for 30 days or longer. <p>Contingency Measures:</p> <ul style="list-style-type: none"> Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place. <p>Monitoring:</p> <ul style="list-style-type: none"> Conduct daily inspections of construction equipment for leaks / spills. Conduct regular site inspections and monitoring of turbines by a designated on-site Environmental Monitor. Implement contingency measures in the event of a spill. <p>Contingency Measures:</p> <ul style="list-style-type: none"> In the event of a spill, immediately stop all work until the spill is cleaned up. Install a spill collection pad for refuelling and maintenance; Notify MOE's Spills Action Centre of any leaks or spills. Assess and remediate affected soils and water by using spill kit kept on site.

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Valleyland VA -01 VA -02 VA -03 VA -04 VA -05 VA-06 VA-07	Construction and Decommissioning of Access Roads, and Underground Collection (applies to all valleylands where these components are within 120m).	<ul style="list-style-type: none"> • Soil/water contamination resulting from accidental spills; • Soil / water contamination by oils, gasoline, grease and other materials (e.g., turbine lubricant, maintenance personnel) resulting from turbine operation and maintenance, substation operation and maintenance, or transmission line maintenance. • Changes to surface water hydrology resulting from turbine and road construction near Significant Valleyland Feature. • Increase in impervious surfaces from presence of turbine foundation and access roads, resulting in increased water temperatures, increased surface runoff and stream peak flows, and reduced infiltration, base flows and upwelling. • VA-03 is within the construction disturbance of Turbine 7 and its associated underground collection and road access. Potential effects during construction listed above have the greatest potential in this location because of the proximity of the valleyland. Stable top of bank is to be determined prior to construction of turbine, such that all turbine components are within the tableland. 	<ul style="list-style-type: none"> • Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. For construction activities within 30 m of a valleyland feature, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e., heavy duty silt fencing, straw bales). • Control soil / water contamination through Best Management Practices. • Develop a spill response plan outlining steps to contain any spills during maintenance activities to avoid contamination of valleyland features. Train staff on associated procedures and maintain emergency spill kits on site. • Ensure machinery arrives on site in a clean, washed condition and is maintained free of fluid leaks. • Dispose of any waste material from maintenance activities by authorized and approved off-site vendors. • Site maintenance, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features including water bodies and significant woodlands, wetlands, and wildlife habitat. • Implement vehicle and equipment cleaning procedures and practices to minimize or eliminate the discharge of pollutants from vehicle / equipment cleaning operations to watercourses or natural areas. • Store any stockpiled materials away from natural features to prevent deleterious substances from inadvertently discharging to the environment. • Only apply herbicides (if required) when wind speeds are low and no significant precipitation is expected (does not apply to agricultural practices). • Only use herbicides (if required) approved for use adjacent to water bodies, riparian buffers, or woodland edges (does not 	<p>Monitoring:</p> <ul style="list-style-type: none"> • Conduct daily inspections of construction equipment for leaks / spills. • Implement contingency measures in the event of a spill. <p>Contingency Measures:</p> <ul style="list-style-type: none"> ▪ In the event of a spill, immediately stop all work until the spill is cleaned up; ▪ Install a spill collection pad for refuelling and maintenance; ▪ Notify MOE's Spills Action Centre of any leaks or spills; ▪ Assess and remediate affected soils and water by using spill kit kept on site; ▪ For spills near wetlands, analyze water samples for general chemistry (e.g., temperature, pH, dissolved oxygen, and conductivity), suspended solids, turbidity, nutrients and total metals (e.g., copper, iron, zinc and aluminum). ▪ Monitor daily to ensure proper cleanup is completed. <p>Monitoring:</p> <ul style="list-style-type: none"> • Inspect locations following completion of construction to ensure no grade changes. <p>Contingency Measures:</p> <ul style="list-style-type: none"> • If surface water drainage alterations are detected, undertake corrective measures to restore drainage pattern

Feature ID	Project Phase & Activity within 120m of the Feature	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
			apply to agricultural practices). • Limit changes in land contours. • Maintain streams and timing and quantity of flow. • Adhere to all setback requirements from watercourses. • Control quantity and quality of stormwater discharge using best management practices, and implement infiltration techniques to the extent possible (e.g., use of a permeable surface for access roads). • All components will be located within stable top of bank.	

Table 3-5 Mitigation Measures, Residual Effects and Monitoring Plan: Generalized Candidate Significant Wildlife Habitat

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
<p>Increased erosion, sedimentation and turbidity resulting from clearing and grubbing, excavation, backfilling and stockpiling.</p>	<ul style="list-style-type: none"> Minimize erosion, sedimentation and turbidity from clearing, grubbing, excavation, backfilling and stockpiling. 	<ul style="list-style-type: none"> Develop and implement an erosion and sediment control plan before commencement of construction. Utilize erosion blankets, erosion control fencing, straw bales, etc. For construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (i.e. heavy duty silt fencing, straw bales). Keep sediment and erosion control measures in place until disturbed areas have been stabilized (i.e., re-vegetated). Schedule grading within 30 m of a watercourse or wetland to avoid times of high runoff volumes (spring and fall), wherever possible. Temporarily suspend work if high runoff volume is noted or excessive flows of sediment discharges occur until mitigation measures are in place. Re-vegetate temporary roads to pre-construction conditions as soon as possible after construction activities are complete using species native to Ontario in naturally vegetated areas. 	<ul style="list-style-type: none"> Increased erosion, sedimentation and turbidity avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> Monitor on-site conditions (i.e., erosion and sediment control, spills, flooding, etc.) where construction occurs within 30 m of a feature on the following basis: <ul style="list-style-type: none"> Weekly during active construction periods; Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (i.e., spring freshet); Daily during extended rain or snowmelt periods; Monthly during inactive construction periods, where the site is left alone for 30 days or longer. Analyze water samples for general chemistry (e.g., temperature, pH, dissolved oxygen, and conductivity), suspended solids, turbidity, nutrients and total metals (e.g., copper, iron, zinc and aluminum). In the event that a spill / flooding occurs, the details of the event will be reported back to MOE, including a description of any assessment and remediation undertaken. <p>Contingency Measures:</p> <ul style="list-style-type: none"> Suspend work if excessive flows of sediment discharges occur until mitigation measures are in place. Water samples will be analyzed for general chemistry (e.g., temperature, pH, dissolved oxygen, and conductivity), suspended solids, turbidity, nutrients and total metals (e.g., copper, iron, zinc and aluminum).
<p>Removal/disturbance of topsoil and increased soil compaction from manoeuvring of heavy machinery, excavation and backfilling.</p>	<ul style="list-style-type: none"> Minimize removal/disturbance of topsoil and increased soil compaction. 	<ul style="list-style-type: none"> Minimize vehicle traffic on exposed soils, avoid compacting or other hardening of natural ground surface, and avoid the movement of heavy machinery on areas with sensitive slopes. 	<ul style="list-style-type: none"> Increased erosion, sedimentation and turbidity avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> See erosion and sedimentation above.
<p>Increased erosion, sedimentation and turbidity resulting from directional drilling.</p>	<ul style="list-style-type: none"> Minimize erosion, sedimentation and turbidity. 	<ul style="list-style-type: none"> Conduct all drilling by licensed drillers in accordance with Regulation 903 under Ontario Water Resources Act, R.S.O. 1990. Set back drill entry and exit pits at least 30 m from natural features (i.e. woodlands, wetlands) or water bodies. Monitor natural features for signs of surface 	<ul style="list-style-type: none"> Increased erosion, sedimentation and turbidity avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> See erosion and sedimentation above.

Table 3-5 Mitigation Measures, Residual Effects and Monitoring Plan: Generalized Candidate Significant Wildlife Habitat

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
Disturbance and/or mortality to terrestrial wildlife, including barriers to wildlife movement.	<ul style="list-style-type: none"> Minimize disturbance and/or mortality to terrestrial wildlife. 	<p>disturbance.</p> <ul style="list-style-type: none"> Time vegetation removal to avoid periods of habitat use to the extent possible, particularly to avoid sensitive life stages (e.g., breeding season for migratory birds, May 1 to July 30). Undertake active nest surveys if clearing of vegetation must take place during this period. Avoid intersecting likely wildlife migration routes wherever possible. Construction and decommissioning activities within 30 m of woodlands or wetlands should occur during daylight hours, wherever possible. Clearly post construction speed limits. Install and maintain wildlife crossing and speed limit signs on access roads. 	<ul style="list-style-type: none"> Disturbance and/or mortality to terrestrial wildlife, including barriers to wildlife movement avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<p>Monitoring:</p> <ul style="list-style-type: none"> Undertake monthly site inspections to ensure that only specified trees are removed and that there is no damage caused to the remaining trees during construction <p>Contingency Measures:</p> <ul style="list-style-type: none"> Suspend construction during breeding periods.
Disturbance to or loss of wildlife habitat, including active bird nests.	<ul style="list-style-type: none"> Minimize disturbance to/loss of wildlife habitat and vegetation. 	<ul style="list-style-type: none"> Keep vegetation removal to a minimum. For roadside collection line routes, vegetation removal (if any) will be kept to a minimum and will be limited to the road right-of-way. Where construction is to occur within 30 m of natural features, install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation. Damaged trees should be pruned through implementation of proper arboricultural techniques. 	<ul style="list-style-type: none"> Disturbance to or loss of wildlife habitat and damage to vegetation while operating equipment avoided or minimized through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<p>Monitoring:</p> <ul style="list-style-type: none"> Undertake monthly site inspections to ensure that only specified trees are removed, protective fencing is intact and that there is no damage caused to the remaining trees during construction <p>Contingency Measures:</p> <ul style="list-style-type: none"> Suspend construction during breeding periods.
Minor vegetation removal in right of way and possible destruction of bird nests during construction of collection line.	<ul style="list-style-type: none"> Minimize vegetation removal and destruction of bird nests. 	<ul style="list-style-type: none"> Schedule vegetation removal outside of breeding season (May 1 to July 30) where possible. Conduct nest surveys if any substantial vegetation to be removed in breeding season. Construction and decommissioning activities within 30 m of woodlands or wetlands should occur during daylight hours, wherever possible. Complete a detailed inventory of species and abundance to be removed. Re-plant following an area ratio of 1:1 of similar species association (native species) if area to be removed is greater than 1% of the woodland cover. 	<ul style="list-style-type: none"> Vegetation removal minimized and destruction of active bird nests avoided through application of mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<p>Monitoring:</p> <ul style="list-style-type: none"> Undertake monthly site inspections to ensure that only specified trees are removed, protective fencing is intact and that there is no damage caused to the remaining trees during construction <p>Contingency Measures:</p> <ul style="list-style-type: none"> Suspend construction during breeding periods.
Soil / water contamination by	<ul style="list-style-type: none"> Minimize soil/water 	<ul style="list-style-type: none"> Ensure machinery is maintained free of fluid leaks. 	<ul style="list-style-type: none"> Soil and water contamination 	<p>Monitoring:</p>

Table 3-5 Mitigation Measures, Residual Effects and Monitoring Plan: Generalized Candidate Significant Wildlife Habitat

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
<p>oils, gasoline, grease and other materials from construction equipment, materials storage and handling.</p>	<p>contamination.</p>	<ul style="list-style-type: none"> • Site maintenance, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features or water bodies. Vehicle refuelling and maintenance should be done on spill collection pads. • Store any stockpiled materials at least 30 m away from a wetland, woodland or waterbody to prevent deleterious substances from inadvertently discharging to the environment. • Develop a spill response plan and train staff on associated procedures. • Maintain emergency spill kits on site. • Control soil / water contamination through best management practices. • Dispose of any waste material from construction activities by authorized and approved off-site vendors. 	<p>avoided or minimized through application of mitigation measures.</p> <ul style="list-style-type: none"> • Low likelihood and limited magnitude of effect as a result. 	<ul style="list-style-type: none"> • Conduct daily inspections of construction equipment for leaks / spills <p>Contingency Measures:</p> <ul style="list-style-type: none"> ▪ Install a spill collection pad for refuelling and maintenance; ▪ Notify MOE's Spills Action Centre of any leaks or spills; ▪ Assess and remediate affected soils and water; ▪ Analyze water samples for general chemistry (e.g., temperature, pH, dissolved oxygen, and conductivity), suspended solids, turbidity, nutrients and total metals (e.g., copper, iron, zinc and aluminum).
<p>Soil / water contamination by oils, gasoline, grease and other materials from spills during directional drilling.</p>	<ul style="list-style-type: none"> • Minimize soil/water contamination. 	<ul style="list-style-type: none"> • Conduct all drilling by licensed drillers in accordance with Regulation 903 under Ontario Water Resources Act, R.S.O. 1990. • Develop and implement emergency spills plan outlining steps to contain any chemicals or to avoid contamination of adjacent features. • Collect drill cuttings as they are generated and place in a soil bin or bag for off-site disposal. • Ensure drill depth is at an appropriate depth below feature to reduce the risk of a "frac-out". • Install protective fencing around vegetation to prevent accidental damage. 	<ul style="list-style-type: none"> • Risk of soil / water contamination avoided or minimized through application of mitigation measures. • Low likelihood and limited magnitude of effect as a result. 	<p>Monitoring:</p> <ul style="list-style-type: none"> • Monitor directional drilling for the duration of such activities to ensure that "frac-out" does not occur, and if it does, to ensure that there are no effects on surface or groundwater. <p>Contingency Measures:</p> <ul style="list-style-type: none"> ▪ In the event of a "frac-out", immediately stop all work, including the recycling of drilling mud / lubricant. ▪ Monitor "frac-out" for 4 hours to determine if the drilling mud congeals. If drilling mud congeals, take no other action that would potentially suspend sediments in the water column. If drilling mud does not congeal, erect isolation/containment environment (underwater boom and curtain). ▪ If the fracture becomes excessively large, engage a spill response team to contain and clean up excess drilling mud in the water. ▪ If the spill affects an area that is vegetated, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation. Revegetated areas will be monitored twice per year for two years subsequent to "frac-out" to confirm

Table 3-5 Mitigation Measures, Residual Effects and Monitoring Plan: Generalized Candidate Significant Wildlife Habitat

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
<p>Changes in surface water drainage patterns.</p> <p>Obstruction of lateral flows in surface water to wetlands.</p>	<ul style="list-style-type: none"> Minimize changes in surface water drainage patterns and obstruction of lateral flows in surface water to wetlands. 	<ul style="list-style-type: none"> Minimize changes in land contours and natural drainage; maintain timing and quantity of flows. 	<ul style="list-style-type: none"> Changes in surface water drainage patterns and obstruction of lateral flows avoided through mitigation measures. Low likelihood and limited magnitude of effect as a result. 	<p>revegetation is successful.</p> <ul style="list-style-type: none"> Document post-cleanup conditions with photographs and prepare “frac-out” incident report describing time, place, actions taken to remediate “frac-out” and measures implemented to prevent recurrence. Provide incident report to MNR and MOE forthwith. No monitoring or contingency measures required.

3.3 Surface Water and Groundwater

Potential effects to surface water and groundwater, resulting from locating a Project component within the prescribed setbacks to water bodies, are evaluated in the *Water Assessment and Water Body Report* and are described below.

3.3.1 Surface Water

Water features were first identified through the use of available background information for the Project Area as provided by agencies (MNR, MOE, Saugeen Valley Conservation Authority), municipalities (County of Grey, Municipality of West Grey), and available GIS data (NRVIS, LIO). Features were field verified during Site Investigations; as well, any new features fitting the definition of a water body under the Regulation were documented. Records Review indicated that many water features within the Saugeen Watershed occurred within 120m of the Project Location.

In all, more than 50 features were studied; however, a number of the features first identified in Records Review were found to counter the definition of a water body as indicated in O. Reg. 359/09 during Site Investigation surveys. For example, several dugout ponds and temporary drainage channels were identified within agricultural lands; in these cases the features were dropped from further study and addressed solely within the East Durham Wind Energy Centre Natural Heritage Assessment. The water features identified included ponds, small headwater streams, the Saugeen River and its tributaries, and seepage areas. The project location was not within 120m of a lake or 300m of a Lake Trout lake.

The bulk of the pond features identified were determined through Site Investigation to be natural features in the form of vernal pools and wetlands, or dugout ponds created for agricultural or recreational use. As this group did not meet the definition of a water body as defined by the Regulation, these features were assessed solely within the East Durham Wind Energy Centre Natural Heritage Assessment where potential impacts associated with the Project and proposed mitigation were also addressed through the Environmental Impact Study. All other features within 120m of the Project Location determined to be water features with an open water component and not dominated by hydrophytic plant communities were assessed and included in the WBR. Consideration of the distance to project components and water quality/water quantity function of the ponds identified as water features determined this group to be of moderate sensitivity to impacts resulting from Project activities. Ponds determined to comply with the O. Reg. 359/09 definition of a water body and within 120m of the project location were included in the Water Body Report where potential negative impacts and proposed mitigation for the phases of construction, operation and decommissioning were outlined.

The small headwater streams documented within 120m of the Project Location were generally warmwater systems characterized by either intermittent/perennial or permanent flow. Some of the features identified in Records Review were found to be tilled through and under active agricultural use, such that they did not meet the criteria for further assessment or inclusion in the WBR. The largest system within the study area was the Saugeen River; although it was classified in Records Review as a coldwater system by MNR, temperature data collected within 120m of the project location where a crossing is proposed for an underground electrical collection line suggested the river through that area is more characteristic of a cool water system. The next largest stream feature identified was Durham Creek, a coldwater tributary of the Saugeen River documented within 120m of an underground electrical collection line proposed along Baptist Church Road. The most sensitive stream features documented within 120m of the Project Location were the main channels of the Saugeen River and Durham Creek; and no in-water works are proposed for either water body. Several other smaller tributaries of the Saugeen were documented as crossing existing roads where an underground electrical collection line is proposed within the road right of way. All streams determined to comply with the O. Reg. 359/09 definition of a water body and within 120m of the project location were

addressed in the Water Body Report where potential negative impacts and proposed mitigation for the phases of construction, operation and decommissioning are outlined.

A combination of the Ecological Land Classification (ELC) data collected as part of the Natural Heritage Assessment (NHA) and the Site Investigation results for water assessments was used to identify seepage areas that met the definition outlined in O. Reg. 359/09. A total of 6 seepage areas were identified to be within 120m of the Project Location. Of these, 3 were located within 120m of underground electrical collection lines proposed within existing road right of ways, 2 were within 120m of access roads and associated underground electrical collection line, and 1 was within 120m of the construction disturbance limits for a turbine including the associated access roads and underground electrical collection line. None of the seepage areas identified was within 30m of a proposed turbine or transformer substation. Seepage areas determined to be within 120m of the project location were included in the Water Body Report where potential negative impacts and proposed mitigation for the phases of construction, operation and decommissioning were outlined.

In compliance with O.Reg. 359/09, a Water Body Report was prepared to assess negative environmental effects, identify mitigation measures and describe monitoring commitments to address any effects. For a detailed account of this assessment and associated methodology, please refer to the Water Assessment and Water Body Report.

3.3.2 Potential Effects

Potential effects from construction and installation activities on surface water bodies are described in **Table 3-5**.

3.3.3 Mitigation Measures, Residual Effects and Monitoring Plan

Table 3-5 provides mitigation measures and the monitoring plan for each potential effect identified above. Residual effects are discussed in the Water Assessment and Water Body Report.

The environmental effects monitoring plan represents an adaptive management approach to water body protection whereby results of regular site inspection and monitoring will be used to determine how construction methods and measures outlined for environmental protection might be altered to best protect water bodies and other natural ecosystems. As no new crossings of water bodies or in-water works are proposed for the project the greatest potential for negative effects to water features relates to control of erosion through implementation of best management practices, and maintenance of water quality and quantity in streams impacted by dewatering and directional drilling activities. Prior to construction an erosion and sedimentation control plan will be established and an on-site inspection will be conducted to ensure best management practices are effectively employed. Active construction monitoring is prescribed for all locations where directional drilling or dewatering is utilized and where installation of project components is within 30m of a water body. Post construction monitoring will also be required to ensure that disturbed areas are restored and stabilized such that drainage patterns and runoff quality are restored to pre-construction condition. Components of the Environmental Effects Monitoring Plan relating to water bodies are contained within the mitigations measures and contingency plans outlined in Table 3-5.

Table 3-5: Summary of Potential Negative Effects and Proposed Mitigation Measures for Water Body Features

Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
<p>Construction/Decommissioning of Turbine & Associated Access Roads and Underground Collection (where underground collection coincides with access roads)</p> <p>No in-water works are proposed for construction of project components.</p> <p>Construction of proposed access roads to turbines and associated underground electrical collection lines do not entail the crossing of any water body features; nor are any of these components within 30m of a water body.</p> <p>Construction of proposed turbines 7, 8, 10, and 14 (and associated underground electrical collection and access roads) are within 120m of water bodies (streams, ponds and seepage areas); and W6, W46 and W49 are within 120m of access roads (and associated underground electrical collection). No turbine construction is proposed within 30m of a seepage area or any other type of water body.</p> <p>Increased erosion, sedimentation and turbidity from clearing and grubbing on adjacent lands for construction of turbines, pads/turnaround areas, access roads, and underground electrical collection lines.</p> <p>Increased nutrient and/or contaminant inputs to water bodies as a result of overland transport of sediment-laden runoff from the construction area.</p>	<p>Construction/Decommissioning of Turbine & Associated Access Roads and Underground Collection (where underground collection coincides with access roads)</p> <p>Develop and implement an Erosion and Sediment Control Plan before commencement of construction as per Ontario Provincial Standard Specifications (OPSD 219.130).</p> <p>Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. For construction activities within 30 m of a water body, to mitigate potential excessive erosion and sedimentation. Additional erosion and sediment control materials to be kept on hand, (i.e., heavy duty silt fencing, straw bales).</p> <p>Maintain all sediment and erosion control measures until disturbed areas have been replanted and stabilized.</p> <p>Schedule grading to avoid times of high runoff volumes (spring and fall), wherever possible. Temporarily suspend work if excessive flow of sediment discharge occurs until additional mitigation measures are in place.</p> <p>Re-vegetate disturbed areas to pre-construction conditions as soon as possible after construction activities are complete using species native to Ontario in naturally vegetated areas.</p> <p>Minimize vehicle traffic on exposed soils, avoid compacting or other hardening of natural ground surface, and avoid the movement of heavy machinery on areas with sensitive slopes.</p> <p>Where feasible, lighter vehicles and lighter machinery should be used in and around natural areas.</p> <p>Any vehicles used within natural areas should use wide-based tires. Tracked vehicles should be avoided.</p> <p>Ensure machinery is maintained free of fluid leaks.</p> <p>Site maintenance, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features or water bodies. Vehicle refuelling and maintenance should be done on spill collection pads.</p> <p>Store any stockpiled materials at least 30 m away from a water body</p>	<p>No additional monitoring or contingency is prescribed as water features are outside of 30m setback. In addition, water features within 120m of the project location are already treated as part of significant woodland, valleyland, wetland and wildlife habitat such that mitigation, monitoring and contingency plans are prescribed for those features in the Natural Heritage Assessment prepared for the East Durham Wind Energy Centre (LGL, 2012).</p> <p>No additional monitoring or contingency plan proposed beyond what is described for sediment and erosion control.</p>
<p>Removal/disturbance of topsoil and increased soil compaction from manoeuvring of heavy machinery, excavation and backfilling resulting in reduced infiltration of precipitation and increased overland flow.</p>	<p>Where feasible, lighter vehicles and lighter machinery should be used in and around natural areas.</p>	<p>No additional monitoring or contingency plan proposed beyond what is described for sediment and erosion control.</p>
<p>Soil / water contamination by oils, gasoline, grease and other materials from construction equipment, materials storage and handling.</p>	<p>Site maintenance, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features or water bodies. Vehicle refuelling and maintenance should be done on spill collection pads.</p> <p>Store any stockpiled materials at least 30 m away from a water body</p>	<p>Monitoring: Conduct daily inspections of construction equipment for leaks / spills. Implement contingency measures in the event of a spill.</p> <p>Contingency Measures:</p> <ul style="list-style-type: none"> ▪ In the event of a spill, immediately stop all work until the spill is cleaned up; ▪ Install a spill collection pad for refuelling and maintenance;

Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
<p>In the event that dewatering is necessary for the excavation of turbine foundation areas:</p> <ul style="list-style-type: none"> • a reduction in streamflow (due to reduced groundwater upwelling) may occur. This would result in increased surface water temperatures from reduced groundwater contributions. • an increase to streamflows in watercourses that receive dewatering discharge may occur. Groundwater discharge has potential to cause streambed and/or bank erosion and downstream sedimentation if not managed properly. 	<p>to prevent deleterious substances from inadvertently discharging to the environment.</p> <p>Develop a spill response plan and train staff on associated procedures.</p> <p>Maintain emergency spill kits on site.</p> <p>Control soil / water contamination through best management practices.</p> <p>Dispose of any waste material from construction activities by authorized and approved off-site vendors.</p> <p>Control rate and timing of water pumping; pump from deep wells to infiltration galleries adjacent to water bodies or wetlands.</p> <p>Control quantity and quality of stormwater discharge using best management practices, and implement infiltration techniques to the extent possible</p> <p>Restrict taking groundwater and surface water during drought conditions.</p> <p>The water taker will regulate the discharge at such a rate that there is no flooding in the downstream area and no soil erosion, or stream channel scouring is caused at the point of discharge. The water taker will use a discharge diffuser or other energy dissipation device, if necessary, to mitigate flows which physically alter the stream channel or banks.</p> <p>Siltation control measures will be installed at both the taking location upstream of the construction site and (if necessary) the discharge site and will be sufficient for the volumes pumped. All measures will be taken to properly maintain these control devices throughout the construction period.</p> <p>Time construction to avoid periods of habitat use to the extent possible, these timing windows are applied to protect fish from any works in and around water during spawning, migration and other critical life history stages. Construction timing windows are based on site specific criteria such as type of fish species present, thermal regime and fish spawning times (spring or fall). General restricted in-water work timing windows established by DFO are</p> <ul style="list-style-type: none"> ▪ Fall Spawning Period – October 1st to May 31st ▪ Spring Spawning Period – May 1st to July 15th <p>Maintain extra erosion and sediment control materials on site (e.g., heavy duty silt fencing, straw bales).</p>	<p>Monitoring:</p> <p>Monitor water level and streamflow at proposed discharge locations for duration of dewatering activities using staff gauges, water level data loggers, and manual in-stream flow measurements tools to calculate watercourse assimilation capacity.</p> <p>Collect surface water samples from discharge locations before and after construction. Analyze for general chemistry (e.g., temperature, pH, dissolved oxygen, and conductivity), suspended solids, turbidity, nutrients and total metals (e.g., copper, iron, zinc and aluminum). These data will be used to determine background watercourse water quality at discharge locations. In conjunction with the streamflow measurements, these data will allow for site-specific loading calculations to determine watercourse assimilation capacity.</p> <p>The findings of the monitoring program will be reported back to MOE following the completion of dewatering activities for the entire Project.</p> <p>Monitor erosion and sedimentation of receiving watercourse before and during dewatering events, including cross-sections, bank erosion pins and bed material.</p> <p>Contingency Measures:</p> <ul style="list-style-type: none"> ▪ Control rate and timing of water pumping; pump from deep wells to infiltration galleries adjacent to water bodies.

Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
	<p>Maintain sediment and erosion control measures in place until disturbed areas have been stabilized (i.e., re-vegetated). Schedule grading within 30 m of watercourses to avoid times of high runoff volumes.</p> <p>Temporarily suspending work if excessive flows of sediment discharges occur until mitigation measures are in place.</p> <p>Direct discharged water to an appropriately sized energy dissipating outlet device to prevent erosion at the point of discharge.</p> <p>Pass groundwater from dewatering activities (if required) through a sediment filtration system prior to being discharged to a watercourse. Control soil / water contamination through best management practices.</p>	
<p>Changes in surface water drainage patterns.</p>	<p>Minimize changes in land contours and natural drainage; maintain timing and quantity of flows.</p> <p>Any grading of lands adjacent to natural features should match existing grades at the identified set-back, or buffer from the features.</p>	<p>No additional monitoring or contingency is prescribed as water features are outside of 30m setback. In addition, water features within 120m of the project location are already treated as part of significant woodland, wetland, valleyland and wildlife habitat such that mitigation, monitoring and contingency plans are prescribed for those features in the Natural Heritage Assessment.</p>
<p>Damage to riparian vegetation within 30m of a water body while operating construction equipment.</p>	<p>Keep vegetation removal to a minimum. Replant disturbed areas with species native to Ontario.</p> <p>Where construction is to occur within 30 m of natural features, install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation.</p> <p>Trees at risk of being damaged during construction should be pruned through implementation of proper arboricultural techniques.</p> <p>Where excavation for construction of turbines, access roads or associated collection lines is conducted within the rooting zone of trees (e.g., within 5 m of the dripline), proper root pruning measures should be implemented to protect tree roots.</p>	<p>No additional monitoring or contingency is prescribed as water features are outside of 30m setback. In addition, water features within 120m of the project location are already treated as part of significant woodland, valleyland, wetland and wildlife habitat such that mitigation, monitoring and contingency plans are prescribed for those features in the Natural Heritage Assessment prepared.</p>
<p>Degradation of fish habitat as a result of reduced water quality (e.g. increased erosion, introduction of sediments and associated contaminants and/or nutrients to water body).</p>	<p>As no construction is proposed within 30m of a watercourse, no degradation to fish habitat is anticipated. No additional mitigation is prescribed beyond what is identified for dewatering activities (if necessary).</p> <p>Fish spawning timing windows for construction activities (other than dewatering) do not apply due to distance from water bodies.</p>	<p>No additional monitoring or contingency is prescribed beyond what is identified for dewatering activities (if necessary) as water features are outside of 30m setback.</p>
	<p>Construction/Decommissioning of Underground/Overhead Electrical Collection Lines (not associated with turbines or access roads)</p> <p>All proposed water body crossings for installation of electrical collection line will be installed through the use of directional drilling within road right of way, with the exception of the Saugeen River crossing (W5). At W5 construction methods include the option of attaching electrical collection to the existing bridge structure, or installation of an overhead line to span the watercourse. No in water works are proposed. All electrical collection addressed in this section is proposed within the existing maintained road right-of-way.</p> <p>W2, W5, W6, W9, W11, W16, W28, and W17 have existing road crossings where electrical collection lines are proposed, such that the distance to project component indicated below is 0m. W15 is 5m from the construction disturbance area of the underground electrical collection line proposed along County Road 4. The proponent has committed to installing the underground collection</p>	

Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
<p>on the south side of the County Road 4 right-of-way to increase the setback to the feature to >5m. W21 is within 34m of the underground electrical collection line proposed along Concession 4 Road. W26 is within 1.12m of the underground electrical collection line proposed along County Road 4.</p> <p>Damage to riparian vegetation within 30m of a water body while operating construction equipment.</p>	<p>For roadside collection line routes, vegetation removal (if any) will be kept to a minimum and will be limited to within the existing maintained road right-of-way.</p> <p>Where construction is to occur within 30 m of natural features, install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation. Trees at risk of being damaged during construction should be pruned through implementation of proper arboricultural techniques.</p> <p>Where excavation for construction of access roads or collection lines is conducted within the rooting zone of trees (e.g., within 5 m of the dripline), proper root pruning measures should be implemented to protect tree roots.</p> <p>Conduct all drilling by licensed drillers in accordance with Regulation 903 under Ontario Water Resources Act, R.S.O. 1990.</p> <p>Set back drill entry and exit pits at least 30 m wherever feasible from natural features (i.e., woodlands, wetlands) or water bodies.</p> <p>Develop and implement an Erosion and Sediment Control Plan before commencement of construction as per Ontario Provincial Standard Specifications (OPSD 219.130).</p> <p>Maintain all sediment and erosion control measures around entry and exit pits until disturbed areas have been replanted and stabilized.</p> <p>Install protective fencing around vegetation to prevent accidental damage. Re-vegetate disturbed areas to pre-construction conditions as soon as possible after construction activities are complete using species native to Ontario in naturally vegetated areas.</p> <p>Monitor natural features for signs of surface disturbance.</p>	<p>Monitoring: Undertake monthly site inspections to ensure that only specified trees are removed, protective fencing is intact and that there is no damage caused to the remaining trees during construction.</p> <p>Contingency Measures:</p> <ul style="list-style-type: none"> ▪ In the event that trees are damaged during construction, damaged trees should be pruned through implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. ▪ Consultation with MNR to determine additional contingency measures if necessary.
<p>Increased erosion and sedimentation resulting from directional drilling activities.</p>	<p>Conduct all drilling by licensed drillers in accordance with Regulation 903 under Ontario Water Resources Act, R.S.O. 1990.</p> <p>Set back drill entry and exit pits at least 30 m wherever feasible from natural features (i.e., woodlands, wetlands) or water bodies.</p> <p>Develop and implement an Erosion and Sediment Control Plan before commencement of construction as per Ontario Provincial Standard Specifications (OPSD 219.130).</p> <p>Maintain all sediment and erosion control measures around entry and exit pits until disturbed areas have been replanted and stabilized.</p> <p>Install protective fencing around vegetation to prevent accidental damage. Re-vegetate disturbed areas to pre-construction conditions as soon as possible after construction activities are complete using species native to Ontario in naturally vegetated areas.</p> <p>Monitor natural features for signs of surface disturbance.</p>	<p>Monitoring: Monitoring of on-site conditions (i.e., erosion and sediment control measures) where construction occurs within 30 m of a water body on the following basis:</p> <ul style="list-style-type: none"> • Weekly during active construction periods; • Prior to, during and post forecasted large rainfall events (>20 millimetres in 24 hours) or significant snowmelt events (i.e., spring freshet); • Daily during extended rain or snowmelt periods; • Monthly during inactive construction periods, where the site is left alone for 30 days or longer. <p>In the event that excessive discharge of sediment occurs, the details of the event will be reported back to MOE, including a description of any assessment and remediation undertaken.</p> <p>Pass groundwater from dewatering activities (if required) through a sediment filtration system prior to being discharged to a watercourse.</p> <p>Control soil / water contamination through best management practices.</p> <p>Contingency Measures: Suspend work if excessive flows of sediment discharges occur until additional mitigation measures are in place.</p> <p>Water samples will be analyzed for general chemistry (e.g., temperature, pH, dissolved oxygen, and conductivity), suspended solids, turbidity, nutrients and total metals (e.g., copper, iron, zinc and aluminum) during and after construction.</p> <ul style="list-style-type: none"> • Monitor directional drilling for the duration of such activities to ensure that "frac-out" or accidental intrusion does not occur, and if it does, to
<p>Soil / water contamination by oils, gasoline, grease and other materials from spills during</p>	<ul style="list-style-type: none"> • Conduct all drilling by licensed drillers in accordance with Regulation 903 under Ontario Water Resources Act, R.S.O. 1990. 	<ul style="list-style-type: none"> • Monitor directional drilling for the duration of such activities to ensure that "frac-out" or accidental intrusion does not occur, and if it does, to

Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
<p>directional drilling.</p> <p>Fractures in substrate releasing pressurized drilling fluids into watercourse and causing potential change to groundwater flow patterns due to directional drilling.</p>	<ul style="list-style-type: none"> • Develop and implement emergency spills plan outlining steps to contain any chemicals or to avoid contamination of adjacent features. • Collect drill cuttings as they are generated and place in a soil bin or bag for off-site disposal. • Ensure drill depth is at an appropriate depth below feature to reduce the risk of a “frac-out”. • Install 	<p>ensure that there are no effects on surface or groundwater.</p> <ul style="list-style-type: none"> • Monitoring should occur daily for time of active drilling beneath watercourses. Construction monitors should be trained and experienced in detecting “frac-outs”. • Contingency Measures: <ul style="list-style-type: none"> ▪ In the event of a “frac-out”, immediately stop all work, including the recycling of drilling mud / lubricant. ▪ Monitor “frac-out” for 4 hours to determine if the drilling mud congeals. If drilling mud congeals, take no other action that would potentially suspend sediments in the water column. If drilling mud does not congeal, erect isolation/containment environment (underwater boom and curtain). ▪ If the fracture becomes excessively large, engage a spill response team to contain and clean up excess drilling mud in the water. ▪ If the spill affects an area that is vegetated, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation. Revegetated areas will be monitored twice per year for two years subsequent to “frac-out” to confirm revegetation is successful. ▪ Document post-cleanup conditions with photographs and prepare “frac-out” incident report describing time, place, actions taken to remediate “frac-out” and measures implemented to prevent recurrence. Provide incident report to MNR and MOE forthwith.

Note: no water bodies are located within 120m of the proposed substation or construction laydown area.

3.3.4 Geology and Groundwater

A desktop study will be conducted to identify potential effects to the groundwater from the construction and installation of the Project. Materials used include MOE Water Well Records, geological descriptions from the Ontario Geological Survey (OGS), air photos and Geographic Information System (GIS), as well as the turbine layout for the Project Site and turbine construction details.

3.3.4.1 Potential Effects

Potential effects from construction and installation activities are as follows:

- Dewatering (if required) when excavating and constructing the turbine bases, resulting in a reduction in quality and quantity of groundwater.
- Increase in impervious area created by the turbine base and access roads resulting in reduced infiltration near to the noted groundwater recharge areas (beach ridge and glacial outwash deposits).
- Formation of sinkholes during foundation construction.

3.3.5 Mitigation Measures, Residual Effects and Monitoring Plan

Table 3-6 provides mitigation measures, residual effects and the monitoring plan for each potential effect identified above.

Table 3-6 Mitigation Measures, Residual Effects and Monitoring Plan: Geology and Groundwater

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
Reduction in groundwater quality and quantity due to dewatering when excavating and constructing the turbine bases.	<ul style="list-style-type: none"> • Minimize reduction in groundwater quality and quantity. 	<ul style="list-style-type: none"> • Restrict dewatering during extreme low flow conditions (i.e., high summer) and direct the discharge from dewatering back into the nearest watercourse (following sediment control practices) to negate the potential that drawdown will decrease base flow into streams. • Maintain a setback of 120 m from the nearest water wells, buildings, and significant natural features. 	<ul style="list-style-type: none"> • Reduction in groundwater quality and quantity minimized through application of mitigation measures. • Low likelihood and negligible magnitude of effects based on amount of dewatering required and distance between known water wells, buildings, and significant natural features (> 120 m) and dewatering activities. 	<ul style="list-style-type: none"> • As no water wells, buildings, or significant natural features are located within the calculated radius of influence for construction dewatering, no monitoring or contingency measures are required.
Increase in impervious area created by the turbine base and access roads resulting in reduced infiltration near to the noted groundwater recharge areas (beach ridge and glacial outwash deposits).	<ul style="list-style-type: none"> • Minimize increase in impervious areas. 	<ul style="list-style-type: none"> • Direct runoff from the constructed impervious surfaces to ground surface to prevent any decrease in infiltration and recharge. 	<ul style="list-style-type: none"> • Reduced infiltration near groundwater recharge areas minimized through application of mitigation measures. • Low likelihood and limited magnitude of effects based on amount of dewatering required. 	<ul style="list-style-type: none"> • No monitoring or contingency measures required.
Formation of sinkholes during foundation construction.	<ul style="list-style-type: none"> • Minimize formation of sinkholes. 	<ul style="list-style-type: none"> • Conduct geotechnical investigations at all turbine locations prior to construction. 	<ul style="list-style-type: none"> • Formation of sinkholes avoided through application of mitigation measures. • No likelihood of occurrence. 	<ul style="list-style-type: none"> • No monitoring or contingency measures required.

3.4 Emissions to Air

Construction and installation activities require the operation of equipment, including trucks, cranes, and bulldozers, which represent a source of air emissions from the engines in addition to the generation of dust.

3.4.1 Potential Effects

Potential effects from construction and installation activities are as follows:

- Emissions of contaminants from portable generator sets, truck traffic and other construction vehicles, including but not limited to, nitrogen dioxide, sulphur dioxide, suspended particulates, emissions of greenhouse gases (CO₂, methane).
- Dust as a result of vehicle traffic over gravel roads and/or cleared areas.

No emissions of odours are anticipated.

3.4.2 Mitigation Measures, Residual Effects and Monitoring Plan

Table 3-7 provides mitigation measures, residual effects and the monitoring plan for each potential effect identified above.

Table 3-7 Mitigation Measures, Residual Effects and Monitoring Plan: Emissions to Air

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
Increased dust and air emissions due to construction activity.	<ul style="list-style-type: none"> • Minimize deterioration of air quality. 	<ul style="list-style-type: none"> • Use spray water and environmentally friendly dust suppressants applied at an environmentally acceptable rate to minimize the release of dust from gravel, paved areas and exposed soils only where necessary on problem areas; • Implement a speed limit that will lead to reduced disturbance of dust on paved and unpaved roads; and, • Ensure proper maintenance of vehicles and machinery to limit noise, Criteria Air Contaminant (CAC) emissions and leaks. 	<ul style="list-style-type: none"> • Increased dust and air emissions minimized through application of mitigation measures. • High likelihood of effects occurring; however, any dust and air emissions are short-term and magnitude of such effects will be limited. 	<ul style="list-style-type: none"> • Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan). <p>Contingency Measures:</p> <ul style="list-style-type: none"> ▪ Suspend construction in high winds.

3.5 Noise

As discussed above, construction activities require the operation of equipment, including trucks, cranes and bulldozers that generate noise.

3.5.1 Potential Effects

Potential effects from construction and installation activities are as follows:

- An increase in noise levels due to trucks, cranes and other equipment used to construct the turbines and ancillary infrastructure.

3.5.2 Mitigation Measures, Residual Effects and Monitoring Plan

The following table provides mitigation measures, residual effects and the monitoring plan for each potential effect identified above.

Table 3-8 Mitigation Measures, Residual Effects and Monitoring Plan: Noise

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
Increased noise due to construction activity.	<ul style="list-style-type: none"> Minimize noise increases for inhabited areas. 	<ul style="list-style-type: none"> Ensure that construction equipment is kept in good condition and does not exceed noise emissions as specified in MOE publication NPC-115. Operate construction vehicles in accordance with municipal by-laws. Implement speed limit on unpaved roads. 	<ul style="list-style-type: none"> Increased noise minimized through application of mitigation measures. High likelihood of effect occurring; however, increase in noise levels associated with construction is short-term and magnitude of such effects will be limited. 	<ul style="list-style-type: none"> Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan). <p>Contingency Measures:</p> <ul style="list-style-type: none"> Repair faulty equipment resulting in increased noise levels in a timely fashion.

3.6 Local Interests, Land Use and Infrastructure

Land uses within 300 m of the Study Area were identified through the REA planning process and in consultation with the Municipalities, MTO and local landowners. The following section describes the results of the effects assessment for the construction phase of the Project.

3.6.1 Existing Land Uses and Infrastructure

Common agricultural land uses in West Grey include cash crops (e.g., soybeans, corn and wheat), hay, hobby farming, maple syrup production, woodlots and livestock farming. Other land uses include non-farm residential uses on separate lots created through severances for home building lots, surplus farm dwelling lots and older estate lots, which are scattered throughout the Study Area in limited numbers.

Recreational land uses within the Project Study Area include fishing on the Saugeen River system, which flows throughout the project area, and the region also hosts an active hunting community for deer and fowl. Areas within the Study Area are used by residents for camping, religious retreats and winter sports, such as snowmobiling, cross-country skiing, and snowshoeing. Although there are not many organized public recreation resources within in the Project Study Area a number of hiking trails, canoe routes, and conservation areas exist in the vicinity, such as, the Durham Conservation Area, Moss Lake Conservation Area, Saugeen Conservation Areas, Saugeen Canoe Route, Beaver Valley Bruce Trail and the Flesherton Walking Village Initiative.

3.6.1.1 Potential Effects

Potential effects from construction and installation activities on local interests, land use and infrastructure may include:

- Minor reduction in usable agricultural land.
- Increased congestion due to an increase in truck traffic and short-term lane closures on local roads during delivery of project components.
- Disruption or damage to local infrastructure such as roads, water and sewage pipelines.

3.6.2 Mitigation Measures, Residual Effects and Monitoring Plan

Table 3-9 provides mitigation measures, residual effects and the monitoring plan for each potential effect identified above.

Table 3-9 Mitigation Measures, Residual Effects and Monitoring Plan: Local and Provincial Interests, Infrastructure and Land Use

Potential Effect	Performance Objectives	Mitigation Strategy	Residual Effects	Monitoring Plan and Contingency Measures
Minor reduction in usable agricultural land.	<ul style="list-style-type: none"> Minimize reduction in usable agricultural land. 	<ul style="list-style-type: none"> Minimize length of access roads (most agricultural use only affected during construction) where possible. 	<ul style="list-style-type: none"> Minor reduction in usable agricultural land minimized through application of mitigation measures. High likelihood of effect occurring; however, however limited magnitude due to size of overall footprint within the entire Project Study Area. 	<ul style="list-style-type: none"> No monitoring or contingency measures required.
Increased congestion due to increase in truck traffic and short-term lane closures on local roads during delivery of project components.	<ul style="list-style-type: none"> Minimize disturbances to local traffic patterns. 	<ul style="list-style-type: none"> Develop a traffic management plan for the construction phase and submit to the Municipalities prior to construction; and, Notify the community in advance of construction delivery schedules and install signage to notify road users of construction activity. 	<ul style="list-style-type: none"> Increased congestion due to increase in truck traffic and short-term lane closures minimized through application of mitigation measures. High likelihood of effect occurring; however, limited magnitude due to spread-out nature of the project and duration of lane closures. 	<ul style="list-style-type: none"> Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan). <p>Contingency Measures:</p> <ul style="list-style-type: none"> Establish alternate delivery routes.
Damage to local infrastructure	<ul style="list-style-type: none"> Minimize damage to local infrastructure. 	<ul style="list-style-type: none"> Adhere to best practices regarding the operation of construction equipment and delivery of construction materials; and, Undertake roads condition survey prior to construction and post-construction. 	<ul style="list-style-type: none"> Damage to local infrastructure minimized through application of mitigation measures. Moderate likelihood and magnitude of effects occurring due to presence of oversized loads during delivery of turbine components. 	<ul style="list-style-type: none"> Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan). <p>Contingency Measures:</p> <ul style="list-style-type: none"> Return damaged infrastructure to original condition (or better) where appropriate.

3.7 Areas Protected Under Provincial Plans and Policies

The REA requires a determination as to whether the Project is being proposed in any of the following protected or plan areas:

- Protected Countryside or Natural Heritage Systems in the Greenbelt Plan;
- Oak Ridges Moraine Conservation Plan Areas;
- Niagara Escarpment Plan Area; or
- Lake Simcoe Watershed Plan Area.

The proposed East Durham Wind Energy Centre is not proposed in any of these protected or plan areas. As such, there will be no effects on these areas as a result of the Project.

3.8 Public Health and Safety

Effects on public health and safety during construction have been described in sections 3.4 (Emissions to Air, including Odour and Dust), 3.4 (Noise), and 3.6 (Local and Provincial Interests, Land Use and Infrastructure).

3.9 Other Resources

There are authorized aggregate resources located within the Project Study Area.

There are no landfill or forest resources located within the Project Location. There is a closed landfill site on west side of Baptist Church Road south of North Line, approximately 50 m from the proposed collection line and approximately 400 m from the nearest proposed turbine to the landfill property boundary.

There is no project infrastructure located within 75 m of a petroleum resource.

3.9.1 Potential Effects

No effects on aggregate resources are anticipated as a result of the construction phase of the Project due to the distance between the project and these resources. In addition, there are no effects on landfills or forest resources or petroleum wells as none are present within the Project Location.

4. Summary and Conclusions

Field work and data collection was undertaken to determine the potential effects to the various environmental and social features that may be affected by this Project during the construction and installation phase of the Project. Mitigation measures to manage these potential effects have been identified and monitoring and contingency plans proposed to ensure effects are minimized as outlined above.

The overall conclusion of this *Construction Plan Report* is that this project can be constructed and installed without any significant adverse residual effects.

5. References

Government of Ontario, 2010:

Renewable Energy Approvals Technical Bulletin One: Guidance for Preparing the Project Description Report as Part of an Application under O. Reg. 359/09. Ontario: Queen's Printer.

Ontario Ministry of the Environment, 2011:

Technical Guide to Renewable Energy Approvals. Available:

http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/stdprod_088422.pdf

Ontario Ministry of Natural Resources, 2010:

Biodiversity Explorer, Natural Heritage Information Centre. Available: <http://nhic.mnr.gov.on.ca/>

Ontario Ministry of Natural Resources, 2008:

Noise Guidelines for Wind Farms. Ontario: Queen's Printer.