

NextEra Energy Canada, ULC

Final Design and Operations Report – Goshen Wind Energy Centre

Prepared by:

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Appendices

- Appendix A. Noise Assessment Report
- Appendix B. Site Plan
- Appendix C. Parcel Boundary Setback Reduction Analysis

Glossary of Terms

EIS	Environmental Impact Study
GE.....	General Electric
GIS.....	Geographical Information Systems
HVA.....	Highly Vulnerable Aquifer
kV.....	Kilovolt
LLC	Limited Liability Company
MNR.....	Ontario Ministry of Natural Resources
MOE.....	Ontario Ministry of the Environment
MSDS.....	Material Safety Data Sheets
MTCS.....	Ontario Ministry of Tourism, Culture and Sport
MTO.....	Ontario Ministry of Transportation
MW.....	Megawatt
OGS.....	Ontario Geological Survey
<i>O. Reg. 359/09</i>	Ontario Regulation 359/09
<i>O. Reg. 9/06</i>	Ontario Regulation 9/06
PDR	Project Description Report
PSW	Provincially Significant Wetland
REA.....	Renewable Energy Approval
SCADA.....	Supervisory Control and Data Acquisition
SGRA.....	Significant Groundwater Recharge Area
TC	Transport Canada
The Plan.....	Emergency Response and Communication Plan
The Project.....	Goshen Wind Energy Centre
ULC.....	Unlimited Liability Corporation
UTM	Universal Transverse Mercator

1. Introduction

Goshen Wind, Inc., a wholly owned subsidiary of NextEra Energy Canada, ULC (NextEra) is proposing to construct a wind energy centre project in Bluewater and South Huron, Huron County, Ontario (**Figure 1-1**). The Project will be referred to as the Goshen Wind Energy Centre (the “Project”) and will be located on private lands in the vicinity of the shoreline of Lake Huron. The wind turbine technology proposed for the Project is the GE 1.6-100 Wind Turbine and the GE 1.56-100 Wind Turbine. Although NextEra is seeking a Renewable Energy Approval (REA) for up to 72 wind turbines, only 63 will be constructed for the Project.

This Design and Operations Report was prepared in accordance with the requirements 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 outline the site plan, the design of the facility and equipment to be used, how the facility will be operated, and how effects will be monitored and emergencies managed.

1.1 Summary of Design and Operations Report Requirements

The requirements for the Design and Operations Report 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 Design and Operations Plan Report Requirements

Requirement	Completed	Corresponding Section
Site Plan	Yes	Section 2, Appendix B
Facility Design Plan	Yes	Section 3
Facility Operations Plan	Yes	Section 4
Emergency Response and Communications Plan	Yes	Section 5
Environmental Effects Monitoring Plan	Yes	Section 6

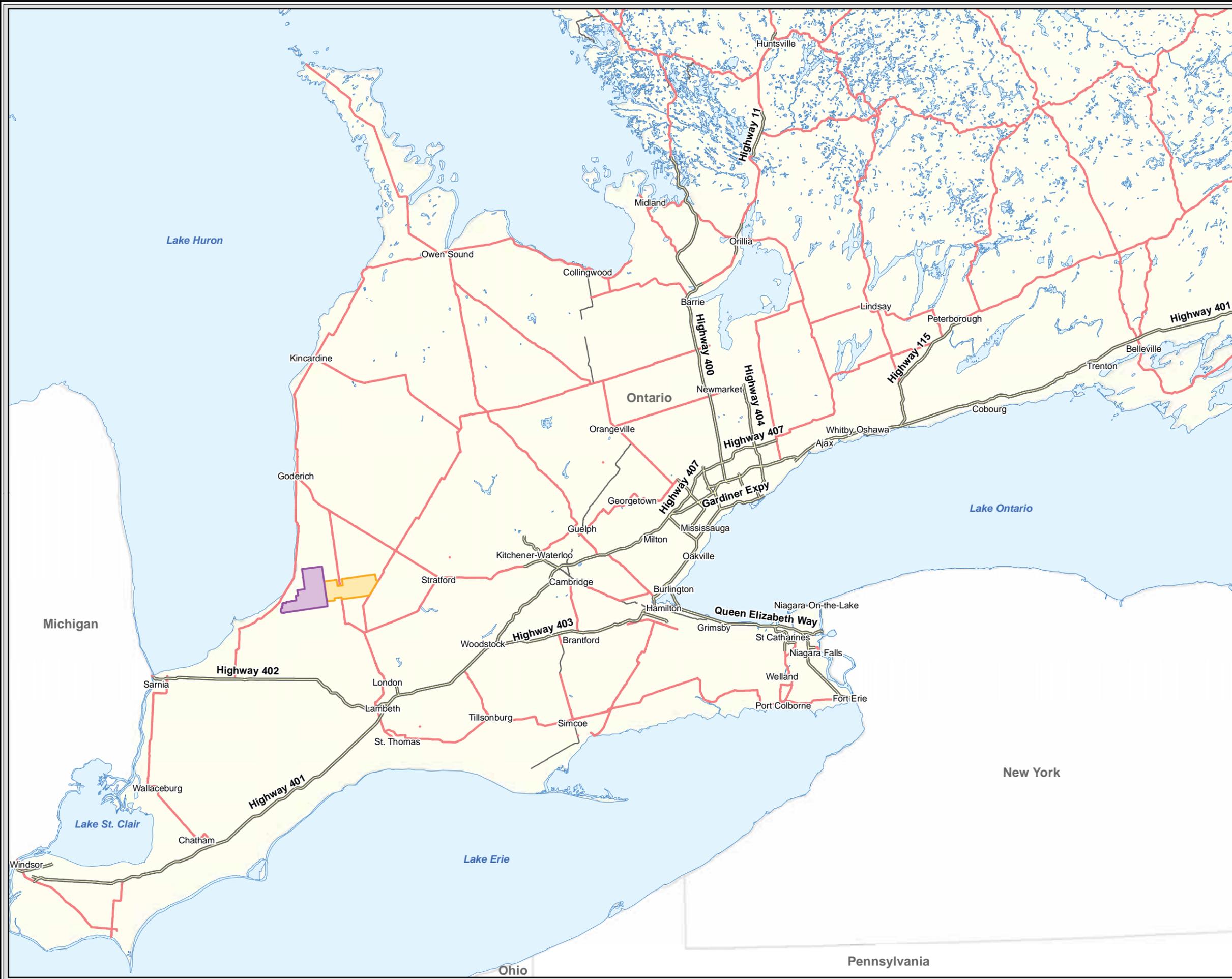
1.2 The Proponent

The Project will be owned and operated by Goshen Wind, Inc., a subsidiary of NextEra. NextEra Energy Canada’s indirect parent company is NextEra Energy Resources, LLC, a global leader in wind energy generation with a current operating portfolio of over 90 wind energy projects in North America. In Canada, wind energy centres 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
Nicole Geneau Project Director NextEra Energy Canada, ULC 390 Bay Street, Suite 1720 Toronto, Ontario M5H 2Y2 Phone: 1-416-364-9714 Email: Goshen.Wind@NextEraEnergy.com Website: www.NextEraEnergyCanada.com	Marc Rose Senior Environmental Planner AECOM 300-300 Town Centre Blvd. Markham, Ontario, L3R 5Z6 Phone: 905-477-8400 x388 Email: marc.rose@aecom.com

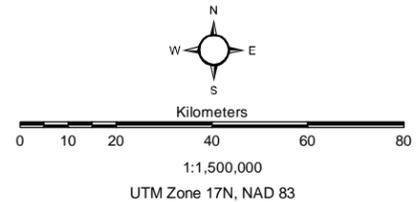
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- Legend**
- Wind Energy Centre Study Area
 - Transmission Line Study Area
 - Expressway
 - Highway
 - Secondary Highway



Basemapping from Ontario Ministry of Natural Resources



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Goshen Wind Energy Centre

Study Area in Ontario

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Figure 1-1

1.3 Project Study Area

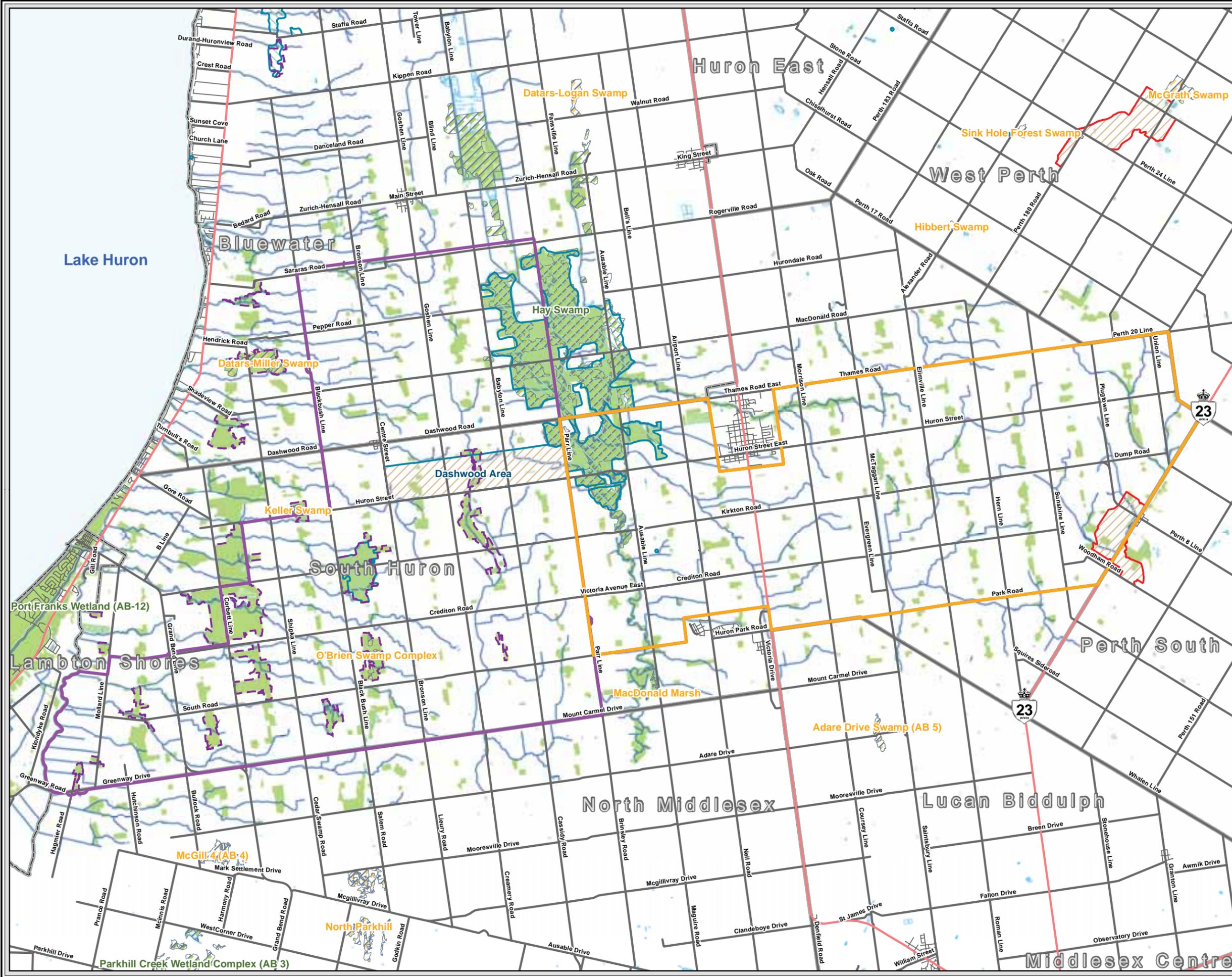
The proposed Project is located in Huron County, within the Municipalities of Bluewater and South Huron. The Project Study Area consists of the areas being studied for the wind farm components (Wind Energy Centre Study Area), as well as for the interconnection route (i.e., the area being studied for transmission lines to connect the Project to the electrical grid) (Transmission Line Study Area) (**Figure 1-2**). The Wind Energy Centre Study Area is generally bounded by Klondyke Road to the west, Rogerville Road to the north, Parr Line to the east, and Mount Carmel Drive to the south, in the Municipalities of Bluewater and South Huron. The Transmission Line Study Area is located to the east of the Wind Energy Centre Study Area, and is generally bounded by Parr Line to the west, Thames Road to the north, Perth 164 Road to the east, and Park Road to the south, extending into the Municipality of South Huron.

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 of the Project Study Area:

Longitude	Latitude
-81.6753290	43.4155312
-81.3011931	43.3810955
-81.3303330	43.3036317
-81.7743607	43.2379854

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Legend

- Wind Energy Centre Study Area
- Transmission Line Study Area
- Municipal Division

Natural Features

- Natural Features (ABCA)
- ESA (ABCA)
- Regionally Significant Life Science ANSI
- Provincially Significant Earth Science ANSI
- Regionally Significant Earth Science ANSI
- Waterbody Segment
- Wetland Area, Permanent

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Project Study Area

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Figure 1-2

2. Site Plan

The Site Plan, presented in this section, details the location of facility components, natural features, noise receptors, required setbacks and lands within 300 m of the Project Location.

The Project Location, situated within the broader Project Study Area, 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” (Government of Ontario, 2009). 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 is located, including the air space occupied by turbine blades.

The proposed Project Location is shown on **Figures 2-1, 2-2 and 2-3 in Appendix B**, and includes the components of the Project listed below:

- Up to 71 GE 1.6-100 Wind Turbine generator locations and pad mounted step-up transformers and one GE 1.56-100 Wind Turbine generator location and pad mounted step-up transformer (however, only 63 turbines will be constructed);
- Turbine laydown and storage areas (including temporary staging areas, crane pads and turnaround areas surrounding each wind turbine);
- Construction laydown area for the purposes of providing temporary storage of construction materials and temporary construction offices and ancillary equipment such as electrical service from the electrical distribution line;
- A transformer substation and ancillary equipment;
- 34.5 kV electrical collection lines to connect the turbines to the transformer substation and other ancillary equipment such as above-ground junction boxes;
- 115 kV transmission line to run from the transformer substation to a breaker switch station which will connect the electricity generated by the project to the existing Hydro One 115 kV transmission line;
- Turbine access roads;
- Three permanent meteorological towers; and
- An operations and maintenance building and ancillary equipment such as an electrical service line connected to the local distribution service.

Disturbance Areas have been identified surrounding various Project components; these 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 and associated disturbance areas including: wind turbines, access roads, the electrical collection system, 115 kV transmission line, the Operations and Maintenance Building, the transformer substation and breaker switch station, 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.

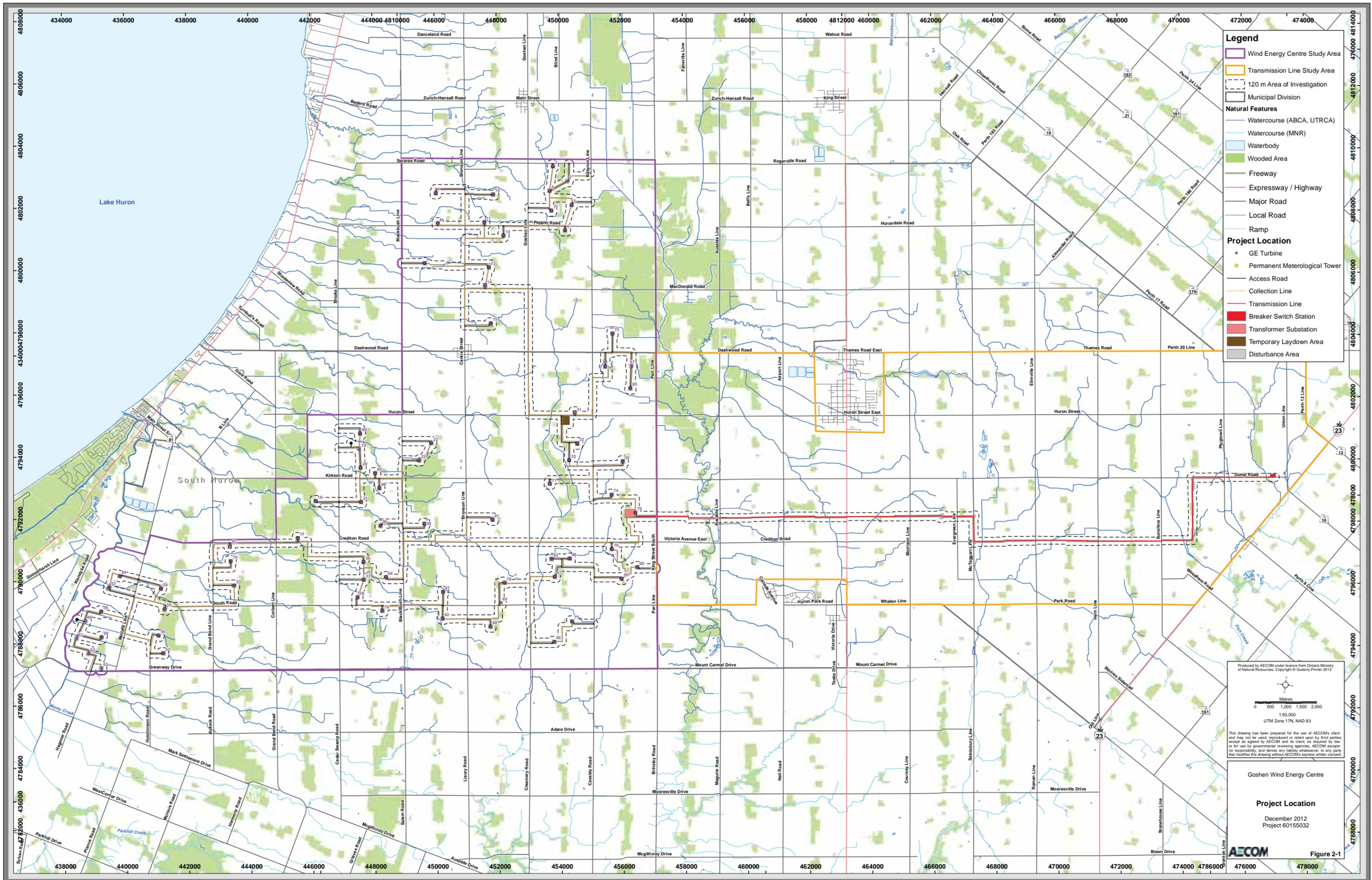
- **Figure 2-2:** shows the location of Project components and associated disturbance areas in relation to surrounding natural heritage and water body features such as: wetlands, woodlands, streams, and Areas of Natural and Scientific Interest, in addition to water wells identified in MOE's database. This figure also illustrates compliance with the 120 m setback distance for natural heritage features, measured from the boundary of the Project Location, and highlights significant natural heritage features that are within those setback distances.
- **Figure 2-3:** shows the location of Project components and associated disturbance areas in relation to surrounding socio-economic features such as: property boundaries, roads and railway right-of-ways, petroleum resources, landfills, aggregate resources and noise receptors. This figure also identifies the setback distances between these features and the Project components. Note that noise compliance is assessed in **Appendix A – Noise Assessment Report** (AECOM, 2013).

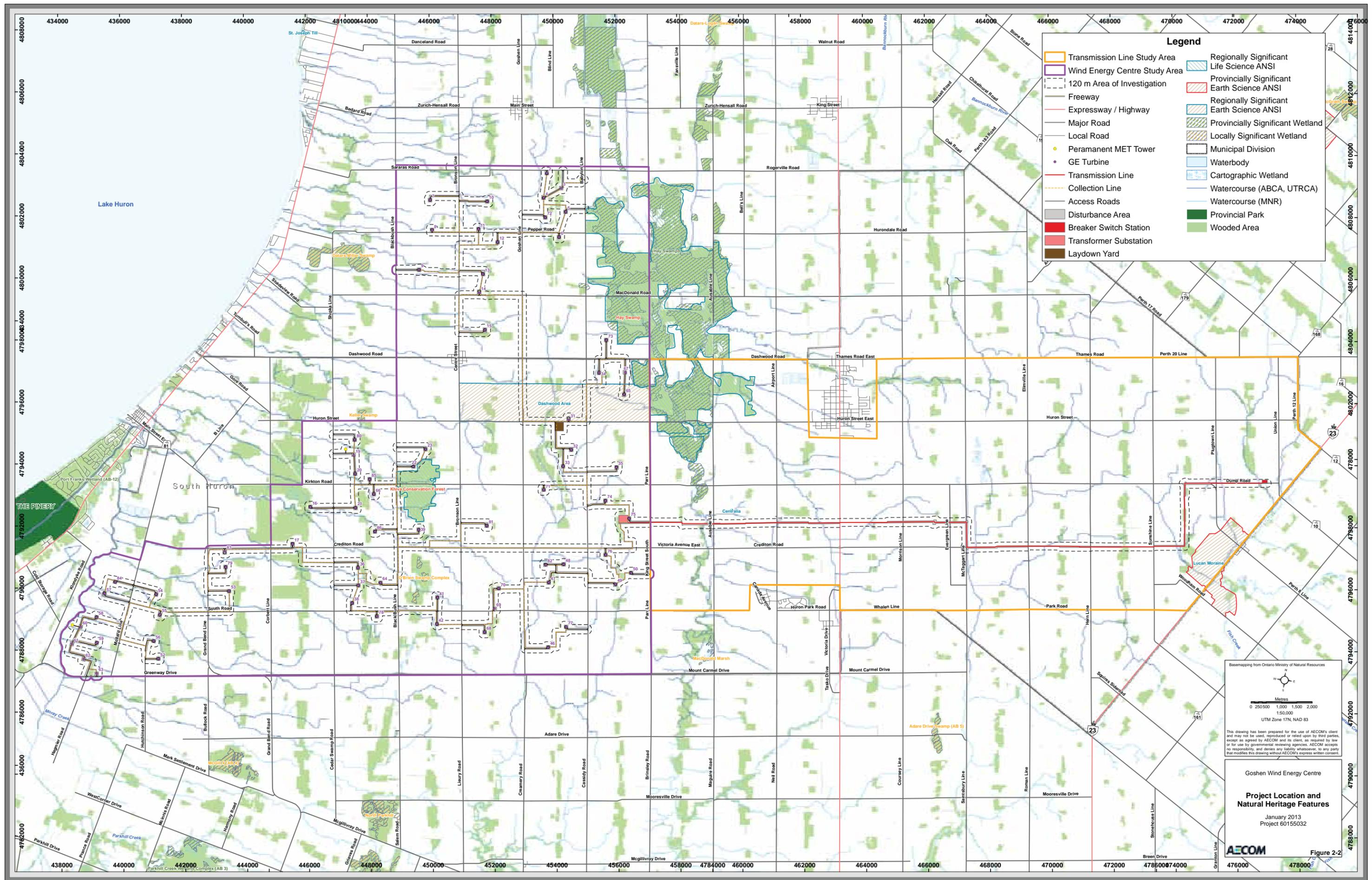
The exercise of siting infrastructure is an iterative process that involves balancing the wind resource with environmental, socio-economic and engineering constraints, including the preferences of individual landowners, while at the same time adhering to the setback distances prescribed by the Province and outlined in *O. Reg. 359/09*. Note that this Site Plan was designed to comply with the setback distances prescribed in *O. Reg. 359/09* and outlined in the following table (**Table 2-1**). Universal Transverse Mercator (UTM) co-ordinates of turbines and the transformer substation are provided in **Appendix B**, along with the location of all noise receptors shown in **Figure 2-3**.

Table 2-1 Ontario Regulation 359/09 Setback Distances

Setback	Distance (metres (m))	Details
Noise Receptors	550*	To be measured from the centre of a turbine's base to a noise receptor.
Property Line	Hub height (80)	Setback can be reduced to blade length plus 10 m (60 m total) measured from the centre of the turbine's base to the nearest property boundary if a Property Line Setback Assessment Report demonstrates that siting turbines closer will not cause adverse effects.
Roads and Railway	Blade length plus 10 m	Blade length plus 10 m (60 m total) measured from the centre of the turbine's base to the boundary of the right-of-way.
Significant Natural Heritage Features	120	Measured from the project location boundary to the nearest point of the natural features. Project components may be sited closer than the prescribed setback if an Environmental Impact Study is prepared.
Water Bodies	120	Measured from the average annual high water mark of a lake, or permanent / intermittent stream (Project components may be sited closer than 120 m if a Water Body Report is prepared - note that turbines and transformers may not be sited closer than 30 m to these features).
Petroleum Resources	75	Setback may be reduced with the submission of a Petroleum Engineer's Report to the MNR.

Note: * Setback does not apply to noise receptors on land owned by a proponent of a wind energy facility or by a person who has entered into an agreement to permit all or part of the facility on their lands.





Legend

	Transmission Line Study Area		Regionally Significant Life Science ANSI
	Wind Energy Centre Study Area		Provincially Significant Earth Science ANSI
	120 m Area of Investigation		Regionally Significant Earth Science ANSI
	Freeway		Provincially Significant Wetland
	Expressway / Highway		Locally Significant Wetland
	Major Road		Municipal Division
	Local Road		Waterbody
	Permanent MET Tower		Cartographic Wetland
	GE Turbine		Watercourse (ABCA, UTRCA)
	Transmission Line		Watercourse (MNR)
	Collection Line		Provincial Park
	Access Roads		Wooded Area
	Disturbance Area		
	Breaker Switch Station		
	Transformer Substation		
	Laydown Yard		

Basemapping from Ontario Ministry of Natural Resources

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Metres

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Project Location and Natural Heritage Features

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