



Stantec

**GRAND VALLEY WIND FARMS –
PHASE 3 WIND PROJECT
PROJECT DESCRIPTION REPORT**

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Prepared for:

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1.0 Introduction

1.1 PROJECT OVERVIEW

Grand Valley Wind Farms Inc. (GVWF) is proposing to develop, construct, operate and decommission the 40 megawatt (MW) Grand Valley Wind Farms - Phase 3 Wind Project (the Project) in the Town of Grand Valley and Township of Amaranth, Dufferin County in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province.

The Project Study Area is generally bordered on the north by Highway 89, on the south by County Road 109, on the east by 9th Line and on the west by East West Luther Townline. The proposed Project Location includes all parts of the land in, on or over which the Project is proposed (the 'construction area' for the Project). The proposed Project Location and Project Study Area are shown in Figures 1 and 2, Appendix A.

The basic components of the Project include:

- Between 14 and 17 wind turbine generators (Siemens SWT-2.3-113 and/or SWT 3.0-113 turbine) with a total maximum installed nameplate capacity of 40MW. The turbine models are identical in structure, and would be 'de-rated', generating less electricity per turbine to meet the contract nameplate capacity. Noise Assessment Reports have been completed for both turbine models as part of the Renewable Energy Approval (REA) process;
- A 34.5 kV underground power line collector system that would transport the electricity generated from the Project to the Hydro One Networks Inc. (HONI) transmission system;
- Fibre optic cabling laid with the underground collector lines;
- Turbine access roads;
- Crane pads;
- One connection point to the existing HONI electrical transmission system;
- Existing operations and maintenance facilities to be leased by the Project (joining the current facilities for the operation of the Grand Valley Phase 1 and 2 Wind Projects). The currently municipally-serviced office facility is located at 35A Main Street South, Grand Valley and the currently unserviced warehouse facility is located at 27 Mill Street West, Grand Valley;
- Existing parking (owned) and gravel quarry (leased) sites to be used for employee parking and temporary construction trailer sites (174321 and 173395 County Road 25, Grand Valley);
- A 34.5 kV/230 kV 45 MVA transformer station; and,

- Meteorological equipment, including an approximately 100 m MET tower or a ground mounted SoDAR unit.

Temporary components include:

- Work and storage areas during construction at the turbine locations and along the underground power line collector system; and,
- Office, parking and storage areas during construction for the work crews during the construction phase of the Project.

GVWF retained Stantec Consulting Ltd. (Stantec) to prepare the REA application with input from Zephyr North Ltd., and Archaeological Services Inc. The REA application is a requirement under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the *Environmental Protection Act* (O. Reg. 359/09), as amended. According to subsection 6 (3) of O. Reg. 359/09, the Project is classified as a Class 4 Wind Facility and will follow the requirements identified in O. Reg. 359/09 for such a facility.

1.2 REPORT REQUIREMENTS

The purpose of the Project Description Report is to provide the public, Aboriginal communities, municipalities, and regulatory agencies with an understanding of the Project, including any environmental effects that may result from engaging in the Project. The Project Description Report has been prepared in accordance with section 54.1 and Item 10, Table 1 of O. Reg. 359/09, and the Ministry of the Environment's (MOE's) *Technical Guide to Renewable Energy Approvals* (MOE 2012). O. Reg. 359/09 sets out specific content requirements for the Project Description Report as provided in Table 1.1.

Table 1.1: Project Description Report Contents: O. Reg. 359/09

Requirements	Completed	Section Reference
Section 54.1		
Requirements to 'crystalize' the Project and fix the location of noise receptors.	✓	3.5
Table 1		
1. Any energy sources to be used to generate electricity at the renewable energy generation facility.	✓	3.1
2. The facilities, equipment or technology that will be used to convert the renewable energy source or any other energy source to electricity.	✓	3.3
3. If applicable, the class of the renewable energy generation facility.	✓	1.1
4. The activities that will be engaged in as part of the renewable energy project.	✓	3.6
5. The name plate capacity of the renewable energy generation facility.	✓	1.1
6. The ownership of the land on which the project location is to be situated.	✓	3.2

Table 1.1: Project Description Report Contents: O. Reg. 359/09

Requirements	Completed	Section Reference
7. If the person proposing to engage in the project does not own the land on which the project location is to be situated, a description of the permissions that are required to access the land and whether they have been obtained.	✓	3.2
8. Any negative environmental effects that may result from engaging in the project.	✓	3.0, Appendix B
9. An unbound, well marked, legible and reproducible map that is an appropriate size to fit on a 215 millimetre by 280 millimetre page, showing the project location and the land within 300 metres of the project location.	✓	Appendix A

2.0 General Requirements

2.1 PROJECT LOCATION

The Project is located on privately-owned land and within municipal road right-of-way (ROW) in the Town of Grand Valley and Township of Amaranth, Dufferin County, Ontario (Appendix A, Figures 1 and 2).

O. Reg. 359/09 defines the Project Location 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”.

For the purposes of this Project, the Project Location includes the footprint of the facility components, plus any temporary work and storage locations (construction area) and facility components (Figure 2). The boundary of the Project Location is used for defining setback and site investigation distances according to O. Reg. 359/09 (the 120 m Zone of Investigation). The construction area would be delineated on private lands, and all construction and installation activities would be conducted within this designated area. Similarly, all installation activities related to collector lines would be contained within the boundaries of the municipal road ROW, to the satisfaction of the municipalities, acting reasonably.

Although O. Reg. 359/09 considers the REA process in terms of the Project Location, the siting of wind projects is an iterative process, and final location of Project components is not available at Project outset. Therefore, a Project Study Area was developed to examine the general area within which the Project components may be sited; information gathered within this larger area feeds into the siting exercise.

The Project Study Area is generally bordered on the north by Highway 89, on the south by County Road 109, on the east by 9th Line and on the west by East West Luther Townline. The Project Study Area was determined through professional judgment and experience with the well-known and generally predictable environmental effects of the construction and operation of wind facilities and associated infrastructure.

Project siting has been refined over the course of the Project assessment, and results can now be presented in terms of Project Location instead of Project Study Areas, although the Project Study Areas continue to be used for public notification.

2.2 CONTACTS

Applicant

The applicant/proponent for the Project is GVWF. The principle contact is:

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2.3 AUTHORIZATIONS REQUIRED

At the federal, provincial and municipal level multiple permits, licenses and authorizations may be required to facilitate the development of the Project, in addition to the REA. The ultimate applicability of all permits, licenses and authorizations would be determined and based on the Project's detailed design.

2.3.1 Federal

It is expected that a Federal Screening report would not be required for the Project, as it is not anticipated that the Project would cause a 'trigger' under the *Canadian Environmental Assessment Act* (CEAA), such as an Authorization by the Department of Fisheries and Oceans under the *Fisheries Act*, or application for project funding under a future program similar to ecoEnergy for Renewable Power. However, the agency consultation program for the Project includes all federal departments and agencies typically interested in wind projects (e.g., Department of National Defence, Environment Canada, Transport Canada, etc.).

Federal permits, licenses and authorizations that have been obtained for the Project are listed in Table 2.1.

Table 2.1: Federal Permits, Licenses and Authorizations

Permit /License/Authorization	Administering Agency	Rationale
Aeronautical Obstruction Clearance	Transport Canada – Aviation Division	Turbine lighting and marking
Scientific Collectors Permit under the <i>Migratory Bird Convention Act, 1994</i> (MBCA) and the federal <i>Species at Risk Act</i> (“SARA”)	Environment Canada/Canadian Wildlife Service	Will be required for collection of any bird or bat carcasses found during post construction monitoring programs
Land Use Clearance	NAV CANADA	Aeronautical safety mapping and designations

2.3.2 Provincial

Provincial permits, licenses and authorizations required for the Project may include those listed in Table 2.2.

Table 2.2: Provincial Permits, Licenses and Authorizations

Permit /License/Authorization	Administering Agency	Rationale
Approval of Connection	Independent Electricity System Operator (IESO)	Electrical interconnect with IESO regulated network
Connection Assessment	IESO	Integration of project with IESO-controlled transmission system
Certificate of Inspection	Electrical Safety Authority	A record that electrical work complies with the requirements of the Ontario Electrical Safety Code
Electrical Safety Inspection	Electrical Safety Authority	Required to connect to the grid. Focus on modifications, costs, timelines and responsibilities outlined in the Customer Impact Assessment.
Customer Impact Assessment (CIA)	HONI	Integration of project with HONI and effects to customers
System Impact Assessment (SIA)	IESO	Assesses to impact of the proposed project on the reliability of the integrated power system
Connection Cost Recovery Agreement (CCRA)	HONI	Recovery of costs to grid operator of changes to allow connection
Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Permit	Grand River Conservation Authority	Work within floodplains, water crossings, river or stream valleys, hazardous lands and within or adjacent to wetlands. Projects requiring review, <i>Fisheries Act</i> authorization and/or assessment under the <i>Canadian Environmental Assessment Act</i> are forwarded to the Department of Fisheries and Oceans (DFO)
Overall benefit permit under the Endangered Species Act	Ministry of Natural Resources	Permit to potentially impact habitat of Species at Risk
Notice of Project	Ministry of Labour	Notify the Ministry of Labour before construction begins
Change of Access and Heavy/Oversize Load Transportation Permit	Ministry of Transportation (MTO)	Compliance with provincial highway traffic and road safety regulations. Transportation of large or heavy items on provincial highways

Table 2.2: Provincial Permits, Licenses and Authorizations

Permit /License/Authorization	Administering Agency	Rationale
Special vehicle configuration permit	MTO	Use of non-standard vehicles to transport large components
Transportation Plan	MTO	Adherence to road safety and suitability
Highway Entrance Permit	MTO	Entrance permit for new or upgraded road entrances onto a provincial highway Interference or obstruction of the highway
Generator's License	Ontario Energy Board (OEB)	Generation of electrical power for sale to grid

2.3.3 Municipal

Municipal permits, licenses and authorizations required for the Project may include those listed in Table 2.3.

Table 2.3: Municipal and County Permits, Licenses and Authorizations

Permit /License/Authorization	Rationale
Permit to Construct or Demolish Dufferin County	Building Permit for turbines and buildings Compliance with building codes
Municipal Consent – agreement on use of the municipal road allowance Town of Grand Valley and Township of Amaranth	Required for use of municipal road allowances for collector line siting
Entrance Permits Town of Grand Valley and Township of Amaranth	Entrance from Municipal and/or County roads
Road Condition Survey Town of Grand Valley and Township of Amaranth	Assessment of pre and post construction conditions of municipal roads to be used for material delivery and construction equipment movement
Traffic Management Plan Town of Grand Valley and Township of Amaranth	Adherence to road safety and suitability, including adherence to load restrictions on municipal roads
Demolition Permit Town of Grand Valley and Township of Amaranth	Required prior to the demolition of the project
Cost Recovery Agreement Town of Grand Valley and Township of Amaranth	To recover internal municipal costs in connection with the project such as building permits.
Sign Permit Town of Grand Valley and Township of Amaranth	As necessary

3.0 Project Information

3.1 ENERGY SOURCES

Wind turbines capture the kinetic energy in surface winds and convert it into electrical energy in the form of electricity. In addition to the tower, wind turbines are comprised of three basic parts: blades, a shaft, and a generator. As wind moves over the turbine's blades it causes "lift"; the same effect used by airplane wings. This lift force causes the blade assembly to rotate. The rotational energy resulting from the movement of the blades is directly transferred to the drive shaft. The rotating shaft transfers the energy into a permanent magnet generator which then converts the mechanical energy into useable 60Hz electricity.

No supplementary fuel sources would be used to generate electricity for the Project.

3.2 LAND OWNERSHIP

The Project would be situated exclusively on privately owned land and municipal road ROW. Prior to confirmation of the placement of Project infrastructure on private lands, landowners entered into option agreements with GVWF, to confirm their interest in hosting infrastructure. As part of this agreement, landowners consented to allowing Project team members onto their properties to undertake field assessments for the Natural Heritage, Water, and Archaeological Assessments as part of the REA application process. Consent for access was granted through the following language from the signed agreements "During the Term, the Developer, its employees, agents, contractors and subcontractors, upon prior notice to the Owner, shall have the right in the nature of a license upon the Property for purposes of conducting activities reasonably related to the development of the Wind Power Facilities, including the performance of all studies and surveys associated therewith, and may perform, or cause to be performed, such other tests and studies as the Developer may desire in connection with the Option, including, meteorological analyses, environmental, avian and cultural resource assessments, geotechnical, foundation and soil tests and drilling, title reports and land surveys/reference plans over and across the Property".

Prior to each site visit, the landowners were contacted by GVWF to notify of the type of studies to be undertaken, and the timeframe. Project team members on-site also made themselves available for questions, or to obtain site-specific information from landowners. The legal descriptions of the parcels of land that would be used for the Project are provided as part of the REA application and are located in Appendix C to this report.

3.3 PROJECT COMPONENTS

3.3.1 Wind Turbine Generators

If approved, the Project would consist of between 14 and 17 wind turbine generators with a total maximum installed nameplate capacity of 40 megawatts (MW). Both the Siemens SWT 2.3-113 and SWT 3.0-113 turbine models are being considered as part of the REA process. The turbine models are identical in structure, and would be ‘de-rated’, generating less electricity per turbine to meet the contracted nameplate capacity. Noise Assessment Reports have been completed for both turbine models as part of the REA process and are provided in the Design and Operations Report. A summary of the basic specifications of a typical turbine model in this class is provided in Table 3.1. Detailed information about the turbine models is provided in the Wind Turbine Specifications Report.

Table 3.1: Basic Wind Turbine Specifications

Manufacturer	Siemens	Siemens
Model	SWT 2.3-113	SWT 3.0-113
Name plate capacity (MW)	2.3 MW	3.0 MW
Hub height above grade	99.5 m	99.5 m
Blade length	55 m	55 m
Full blade diameter	113 m	113 m
Blade sweep area	10,000 m ²	10,000 m ²
Speed range	6-13 rpm	6-16 rpm
Frequency spectrum	60 Hz	60 Hz

The wind turbines consist of a 99.5 m steel tower (four sections), three blades (55 m in length), the nacelle, hub, and step-up transformer. The turbine tower base is approximately 4-5 m in diameter and would be anchored to the concrete foundation using large diameter anchor bolts.

3.3.2 Electrical Infrastructure

A step-up transformer at the base of each turbine is required to transform the electricity created in the nacelle to collector system voltage of 34.5kV. From each step-up transformer, underground collector lines would be constructed parallel to the turbine access roads (where possible), within municipal road ROW, to the 34.5 kV/230 kV 45 MVA transformer station.

The transformer station would occupy an area approximately 100 m X 150 m in size on private lands located in the immediate vicinity of the connection point to the HONI electrical transmission system.

All underground collector lines would be constructed on leased lands and within municipal road ROW. Wherever possible, underground collector lines on private lands would be aligned with the design of the access roads to reduce the area required for construction and minimize potential construction impacts. The cables would be installed immediately to one side of the

access road, within 2-3 m of the graveled surface. In the municipal road ROW, the cables would be installed to the satisfaction of the municipalities, acting reasonably. The collector lines would be buried at a minimum of 1.0 m. Overhead lines are not anticipated for the Project.

3.3.3 Electrical Collector System

The 34.5 kV electrical collector system which would connect the individual wind turbines to the transformer station would consist of buried lines on leased lands or within the municipal road ROW. The majority of the cable for the line would be installed to a depth of at least 1.0 m, significantly reducing the need for open trenching.

Directional drilling, by which conduits and cables are installed along a prescribed bore path using a surface launched drilling rig with minimal impact on the surrounding area, would be used at water and road crossings, and through other areas not conducive to surface installation (at the discretion of the contractor). The entrance and exit points for the cable would be spaced to suit the particular situation and can vary widely in distance depending on the type of bore (i.e., along roadways, road crossings, water crossings, etc.), with pull and junction pits approximately 10 m long X 2 m wide.

For directionally-drilled watercourses, the two required drill pits (entrance and exit points for the conduit/cable) are typically 30 - 50 m from either side of the watercourse, but this may vary depending on specific conditions around any particular crossing. For road crossings, the pits are typically 10 - 20 m from the outer ends of the ditch on either side of the road. The minimum depth below grade of conduits/cables installed using directional drilling techniques would be 1.0 m, with actual installed depths of typically about 1.2 m and up to 2.0 m under watercourses.

3.3.4 Access Roads and Crane Pads

Existing provincial and municipal roads would be used to transport Project-related components, equipment and personnel to the Study Area. The Project would be situated exclusively on privately owned land and municipal road ROW. Access to these lands would be required for installation and operation of the wind turbines. Agricultural laneways present in the vicinity of the Project would be utilized and upgraded where possible. New laneways would be constructed as required and in consultation with landowners, to provide access to the individual turbine sites. Permanent access laneways would be approximately 6 m wide and would not require resizing for the operation phase. Access laneway entrances off municipal roads would be approximately 40 m wide during the construction phase, and reduced to 8-10 m at the end of the construction phase.

Crane pads (typically 30 m x 20 m) would be installed within the construction area adjacent to each turbine location prior to turbine erection, at the same time as the access roads. Generally, the process for crane pad construction would be the same as that for access roads; surface material would be stripped and stockpiled (topsoil separate from subsoil) and a gravel base installed on top of geotextile. The excavated soil would be re-used on site as feasible. Once

turbine erection is complete, the gravel area around each turbine and the crane pads would be kept, while the remaining construction area would be restored to an acceptable condition to meet municipal zoning by-law requirements at the time and to the satisfaction of the landowners following the end of the construction phase. Perimeter surface hydrology would be maintained during crane pad construction.

3.3.5 Water Crossings

Three permanent culvert installations are required for access roads and associated underground electrical collector lines/fibre optic cable. These installations would be in accordance with Department of Fisheries and Oceans (DFO) Operational Statements for works in watercourses.

Where underground collector lines and fibre optic cable cross watercourses and no culvert is required, the buried lines would be installed using directional drilling techniques in suitably sized plastic conduits at a sufficient depth below the watercourse to prevent accidental damage due to dredging or over-excavation. Signs indicating the presence and location of the cables would be placed at regular intervals along the cable route.

All crossings would require permit approval from the Grand River Conservation Authority, and all temporary crossings would comply with appropriate DFO Operations Statements.

3.3.6 Existing Operations and Maintenance Building

The Project would use the existing operations and maintenance facilities currently being used for the operation and maintenance of the existing Grand Valley Wind Farms Phase 1 and 2 projects. The currently municipally-serviced office facility is located at 35A Main Street South, Grand Valley and the currently unserviced warehouse facility is located at 27 Mill Street West, Grand Valley.

3.3.7 Transformer Station

A 34.5 kV/230 kV 45 MVA transformer station would be constructed for connection to the existing HONI electrical transmission system. The transformer station would occupy an area approximately 100 m X 150 m in size on private lands located in the immediate vicinity of the connection point to the HONI electrical transmission system.

Area drainage from the transformer station would be through swales/ditches adjacent to the proposed access road that would collect and convey runoff from the station area and the associated access road. The total drainage area associated with the transformer station and access road “hard” surfaces is less than 2 ha and therefore a “wet” water quality control pond (i.e. one containing a permanent pool) is not required, as per the MOE *SWM Planning and Design Guidelines Manual* (2003). In addition to the conveyance of runoff, the swales would also provide water quality control, which is a suitable stormwater management practice for such an area according to the MOE guidelines.

Within the station footprint, the transformer would be equipped with oil containment storage area to capture oil in the event of a leak.

3.3.8 Met Tower

For operational purposes, meteorological equipment would be installed within the Project boundary. To satisfy the Independent Electricity System Operator (IESO) reporting requirements, the Project will either erect a permanent 100 m (equivalent to wind turbine hub height) MET tower or place a surface mounted SoDAR unit. The MET tower or SoDAR unit would be located in the vicinity of the transformer station.

The tower would be equipped with monitoring sensors at various heights and would be used to complete a power performance study to ensure the performance of the installed wind turbines. The lighting requirements would be based on the requirements of Navigation Canada and Transport Canada regulations. The MET tower or SoDAR unit would remain for the duration of the Project's operating life.

3.4 TEMPORARY COMPONENTS

Lands to be temporarily used during construction include temporary construction facilities, drill pits for directional drilling, delivery truck turnaround areas, staging areas at each turbine, and work crew offices, parking and storage areas. Any temporary structures used during construction would not be serviced (sewage and water), and would be placed within delineated construction work areas.

The existing land use is largely agricultural, and land for temporary components would be restored to an acceptable condition to meet municipal zoning by-law requirements at the time and to the satisfaction of the landowners following the end of the construction phase. Restoration work would follow the installation of the wind turbines and removal of all construction materials (including granular and geotextile material) and equipment from each turbine site. Restoration activities would follow the Site Restoration Plan in the [Decommissioning Plan Report](#).

3.4.1 Turbine Locations

Turbine Staging Areas

Turbine components would be delivered directly to the staging areas, and would be temporarily stored until assembled; there would be no central turbine laydown area. Turbine staging areas would be initiated in conjunction with turbine assembly, and areas impacted by construction activities would be restored to an acceptable condition to meet municipal zoning by-law requirements at the time and to the satisfaction of the landowners following the end of the construction phase. Turbine staging areas would be actively used to varying degrees during all construction activities at the turbine siting areas.

3.4.2 Access Road Locations

Delivery Truck Turnaround Areas

All sites require turnaround areas for delivery trucks. These turnaround areas would be the same width as access roads, with turning radii, and would be constructed in the same manner, including the requirement for staging areas.

The timing of the temporary use of land for the delivery truck turnaround areas would begin with the construction of the access roads (anticipated Spring/Summer 2014) and these areas would be restored to an acceptable condition to meet municipal zoning by-law requirements at the time and to the satisfaction of the landowners following the end of the construction phase. The duration of time that the land would be actively used is expected to be 12 to 18 months.

Access Road Entrances

Access road entrances require a wider turning radius for construction/delivery vehicles. Entrances would be approximately 40 m wide during the construction phase, and reduced to 8-10 m at the end of the construction phase. All final access road entrance dimensions would be designed to the satisfaction of the municipalities, acting reasonably.

3.4.3 Temporary Storage and Parking Areas

The transformer station site would be used as temporary staging areas for construction activities such as a work crew office, parking and storage. Two existing parking (owned) and gravel quarry (leased) sites would be used for additional employee parking and temporary construction trailer sites (174321 and 173395 County Road 25, Grand Valley).

3.5 SITE PLAN

The Site Plan (Appendix A) identifies the following information at the Project Location, or within 300 m of the Project Location:

- Buildings and structures (e.g. turbines, collector and transmission lines, transformer station, etc.);
- Roads;
- Utility corridors;
- Rights-of-way and easements;
- Noise receptors within 2 km of the turbine locations; and
- Wind turbines from proposed and existing facilities.

3.5.1 Description of Site Plan Components

Table 3.2 provides a description of each component of the Site Plan.

Table 3.2: Site Plan Components

Site Plan Component	Description
Project Components	
Buildings or structures	The following buildings or structures are shown on the Site Plan: <ul style="list-style-type: none"> • Turbines • Transformer Station Site • Meteorological tower • Electrical and data collection system • New temporary construction storage, parking, and trailer areas
Roads	Permanent Project access roads for turbine access.
Utility corridors, rights of way or easements	Easements associated with participating properties are for certain access roads and collector system elements.
Existing Features within 300 m of the Project Location	
Buildings or structures	Buildings are shown on the aerial imagery on the Site Plan; these are primarily rural residences, but also include other types of buildings such as agricultural outbuildings and commercial and/or institutional buildings.
Roads	Municipal roads located throughout the Project Area. Highway 89 is located in the northern portion of the Project Area.
Utility corridors, rights of way, and easements	A 230 kV HONI corridor traverses the General Project Area, to which the Project would connect. Utilities located within the road allowances.
Other Site Plan Components	
Noise receptors	Noise receptors are shown, and include: <ul style="list-style-type: none"> • Participating receptors: properties participating in the Project, and to which noise setbacks and limits do not apply; • Non-participating receptors: properties not participating in the Project that have dwellings, buildings used for institutional purposes (educational facility, day nursery, health care facility, community centre or place of worship), and buildings planned for construction that have a building permit; and • Vacant lot receptors: vacant land zoned to allow construction of potential noise receptors; location selected with regard to the typical building pattern in the area. All proposed turbines are located at least 550 m from the nearest non-participating or vacant lot receptor; these receptors are included in the Noise Assessment.
Wind Turbines from Existing or Proposed Facilities	Operating wind turbines in the vicinity of the Project include: <ul style="list-style-type: none"> • Grand Valley Wind Farms Inc. Phase 1 and 2 Wind Projects • TransAlta Melancthon 1 and 2 Wind Projects

3.5.2 Turbine and Transformer Locations

Table 3.3 identifies the turbine locations and the transformer station as shown in the Site Plan (Appendix A). Transformer stations that are part of the Project and are capable of operating at a nominal voltage of 50 kV or more also have siting considerations to avoid impacts from transformer noise. Appendix D contains the UTM coordinates of receptors within 2 km of turbine locations and UTM coordinates of other existing and proposed turbines.

Table 3.3: Turbine and Transformer Station Coordinates

Turbine #	UTM Easting	UTM Northing
101	546165	4873538
102	546188	4872997
103	548193	4872750
104	548297	4872271
105	552907	4870024
106	554074	4870311
107	554657	4870312
108	555316	4869921
109	552688	4864238
110	552887	4863599
112	551622	4863426
113	551529	4861903
114	550852	4861687
115	550750	4860447
117	550194	4860468
118	550461	4859993
120	554159	4869801
Transformer Station	553380	4868754

3.6 PROJECT SCHEDULE

Table 3.4 provides an overview of the projected dates associated with the REA phase of the Project.

Table 3.4: Project Schedule Overview

Milestone	Approximate Date
REA technical studies	Late 2011 to Early 2013
Initiate Public REA Process	December 2012
Public Open House #1	January 2013
Draft REA Reports to Public	February 2013
Final Public Open House	April 2013
Submission of REA application to the MOE	April 2013
REA Decision	Late 2013 (anticipated)
Start of Construction	Spring/Summer 2014 (anticipated)
Commercial Operation Date (COD)	Early 2015
Repowering/Decommissioning	Approximately 20.5 years after COD

3.7 PROJECT ACTIVITIES

3.7.1 Description of Regulated Activities

A general overview of the activities that would be engaged in during construction, operation, and decommissioning of the Project are provided in Table 3.5. More specific details on the Project phases and related activities would be outlined in Construction Plan Report, Design and Operations Report, and Decommissioning Plan Report.

Table 3.5: Key Project Activities

Project Phase	Activities
Construction	Turbine Sites
	Delineation and staking of temporary work areas
	Completion of necessary site grading
	Access road construction and culvert installation
	Hauling fill and materials to site
	Installation of tower foundations
	Installation of crane pads
	Installation of underground collector lines
	Turbine component deliveries and offloading
	Turbine assembly and erection
	Restoration of temporary work areas (de-compaction, topsoil replacement, possible reseeding, etc.)
	Transformer Station
	Installation of transformer station
	Interconnection to HONI electrical grid
	Restoration of temporary work areas (de-compaction, topsoil replacement, possible reseeding, etc.)
	Site landscaping (possible planting of trees and/or shrubs)
	Additional Activities
	Component/Material transportation to Project Location
Installation of collector lines in municipal road allowances	
Installation of permanent Met Tower	
Operation	Turbine Sites
	Preventative and routine maintenance
	Unplanned maintenance
	Grounds keeping
	Transformer Station
	Preventative and routine maintenance
	Meter calibrations
	Unplanned maintenance
Additional Activities	
Collector line maintenance	
Decommissioning	Turbine Sites
	Removal of tower and turbine infrastructure
	Turbine site grading (dependent upon new proposed use)

Table 3.5: Key Project Activities

Project Phase	Activities
	Possible removal of access roads dependent upon agreement with landowner
	Possible excavation and removal of underground collector lines depending upon depth and agreement with property owner
	Transformer Station and Electrical Control Building
	Removal of transformer station and met tower
	Disconnection from electrical grid
	Additional Activities
	Component removal and reuse, recycling, or proper disposal
	Removal of collector lines in municipal road allowances (remove wires and poles as required)

3.7.2 Facility Phases, Timing and Scheduling

The projected starting dates for Project construction, operation and decommissioning activities are provided in Table 3.6 below. The construction schedule is detailed in the Construction Plan Report. Operation and maintenance activities would occur as required throughout the life of the Project, as detailed in the Design and Operations Report. While the specific schedule for decommissioning would be determined at the time it is undertaken, the general staging of undertakings is outlined in the Decommissioning Plan Report.

The wind turbines are expected to be in service for the term of the 20 year Ontario Power Authority Feed-In Tariff contract. Following the term of the contract, a decision would be made regarding whether to extend the life of the facility or to decommission. Barring routine scheduled maintenance, the turbines are expected to be operational 24 hours a day, 7 days a week, assuming appropriate wind conditions.

Table 3.6: Construction Activities - Projection and Schedule

Construction Phase Details	Schedule	Duration
Turbine Sites		
Delineation and staking of temporary work areas	Spring/Summer 2014	2 weeks
Access road construction	Spring/Summer 2014	6 weeks
Installation of tower foundations	September – October 2014	8 weeks
Installation of transformer station and construction of electrical control building	September – October 2014	8 weeks
Installation of crane pads	October 2014	2 weeks
Installation of underground collector lines parallel to access roads	August - October 2014	8 weeks
Installation of collector lines in municipal road allowances	August - November 2014	12 weeks
Turbine delivery, assembly and erection	October – December 2014	12 weeks
Interconnection to the existing HONI electrical grid	December 2014	1 week
Restoration of temporary work areas (de-compaction, topsoil replacement, reseeding, etc.)	Late Spring 2015	8 weeks

Note: Construction activities would take place during regular construction hours. When construction is anticipated to be required outside of these hours, the timing would be discussed in advance with the Town of Grand Valley and the Township of Amaranth.

3.7.3 Waste Generation

Construction and Decommissioning

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

All wastes would be handled and recycled or disposed of in accordance with regulatory requirements.

Operation

Lubricating and hydraulic oils associated with turbine maintenance and operation would generate waste materials, such as oily rags, empty grease/oil containers, and cleaning fluids in low volumes. Oil changes are scheduled in accordance with the annual oil analysis findings. Used oil would be stored in a designated area, and picked up by a licensed contractor with the appropriate manifests in place.

A small amount of domestic waste (i.e. garbage, recycling, and organics) would be generated during standard operation and maintenance activities. All wastes would be handled and recycled or disposed of in accordance with regulatory requirements. Further details on waste management and disposal would be developed during the detailed design phase of the Project, post-REA.

3.7.4 Air Emissions and Dust Generation

Construction and Decommissioning

Construction and decommissioning activities would require a wide range of mobile equipment, such as bulldozers, excavators, dump trucks, concrete delivery trucks, directional drill equipment, and cranes. The engine exhaust from these vehicles, especially from those operating on diesel fuel, represents a source of particulate and other emissions.

Construction related traffic and various construction activities (e.g. excavation, grading, soil stripping and exposed areas) have the potential to create nuisance dust in the immediate vicinity of the Project.

Operation

During operations minor localized air emissions would occur from the periodic use of maintenance equipment and personnel vehicles. Operations traffic has the potential to create nuisance dust in the immediate vicinity of the Project; however, effects are anticipated to be short-term in duration and highly localized.

An examination of the Project's air emissions was undertaken in context of the requirements of O. Reg. 419/05 Air Pollution – Local Air Quality, as provided in the Design and Operations Report. It was determined that since O. Reg. 419/05 does not apply to discharges of contaminants from motor vehicles, and all other facility sources can be considered negligible, no further assessment is required.

3.7.5 Noise Emissions

Construction and Decommissioning

During construction of the Project, noise would be generated by the operation of heavy equipment and associated vehicular traffic on-site and on haul routes. All emissions would be managed within the limits set by regulatory requirements.

Operation

Mechanical and aerodynamic noise would be emitted from the wind turbines. Noise Assessment Reports have been completed for the Project in accordance with the MOE document "*Noise Guidelines for Wind Farms*", dated October 2008 and O. Reg. 359/09, and are provided as an appendix in the Design and Operations Report.

Based upon the Project design, the analysis carried out in the Noise Assessment Reports indicates that noise produced by the Project would be within the acceptable limits established by the MOE at all noise receptors within the Wind Project Study Area.

3.7.6 Hazardous Materials

Construction and Decommissioning

Hazardous materials are limited to fuels and lubricants that would be on-site for use in equipment. These materials would be stored in appropriate storage containers by the construction contractor. Designated storage areas and the type of storage areas would be confirmed prior to construction. Disposal of any hazardous materials would be in accordance with regulatory requirements.

Operation

Hazardous materials are limited to lubricants and fluids for the operation and maintenance of the turbines. Designated storage areas and the type of storage areas would be confirmed prior to operations. There are no other known hazardous by-products of the wind energy generation process itself.

3.7.7 Sewage and Stormwater Management**Construction and Decommissioning**

Sanitary waste generated by the construction and decommissioning crews would be collected via portable toilets and wash stations supplied by the construction contractor. Disposal of these wastes would be the responsibility of the contracted party and would be done in accordance with regulatory requirements.

During construction and decommissioning, proper grading would be conducted and mitigation measures implemented to reduce potential for stormwater runoff at the work areas.

Operation

The current warehouse facility is unserviced, as it serves solely as repair and storage space. The nearby office in Grand Valley is municipally-serviced. No stormwater management activities are required as part of the operation of the Project.

3.7.8 Water-taking Activities**Construction and Decommissioning**

Depending on groundwater levels, some dewatering activities may be required during turbine foundation excavation and installation of underground collector lines; however, based on the field conditions observed during the construction of the Grand Valley Wind Farms - Phase 1 and 2 Wind Project, withdrawal amounts are anticipated to be minimal and would not exceed 50,000 litres (L) per day.

Operation

The current warehouse facility is unserviced. The nearby office facility is municipally-serviced. No groundwater or surface water-taking activities are planned as part of the operation of the Project.

4.0 Description of Potential Environmental Effects

Based on the current understanding of the potential effects of constructing, operating, and decommissioning a wind project, Project-specific issues and potential effects have been identified (see Appendix B). Appendix B1 describes potential effects and mitigation measures for construction and decommissioning of the Project and Appendix B2 describes potential effects and mitigation measures for operation and maintenance of the Project. Appendix B3 outlines monitoring plans for the construction, operation and decommissioning of the Project. Detailed descriptions of all potential effects, mitigation measures, and monitoring plans are provided in the following reports:

- Construction Plan Report;
- Design and Operations Report, includes:
 - Property Line Setback Assessment;
 - Noise Assessment Reports;
- Decommissioning Plan Report;
- Natural Heritage Assessment / Environmental Impact Study (NHA/EIS);
- Water Assessment / Water Body Report (WAWBR);
- Heritage Assessment Report;
- Stage I Archaeology Assessment; and,
- Stage II Archaeological Assessment Report.

The Project maps (Appendix A) show the Project Location, including proposed infrastructure and natural features within the Project Location. Setback areas, as defined by O. Reg. 359/09, are also shown. Where Project infrastructure is within a setback, additional analysis is provided within the NHA/EIS and WAWBR.

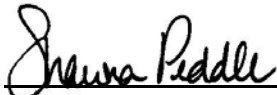
Monitoring plans have been developed for the various stages of the Project and are identified within the Construction Plan Report, Design and Operations Report, and NHA/EIS. This includes the identification of performance objectives, monitoring requirements and contingency plans, as well as various management systems/programs/plans/procedures. A Complaint Response Protocol would be developed and implemented during all stages of the Project's lifecycle.

5.0 Closure

The Project Description Report for the Grand Valley Wind Farms - Phase 3 Wind Project has been prepared by Stantec for Grand Valley Wind Farms Inc. in accordance with Ontario Regulation 359/09 and the *Technical Guide to Renewable Energy Approvals* (MOE, 2012).

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

STANTEC CONSULTING LTD.



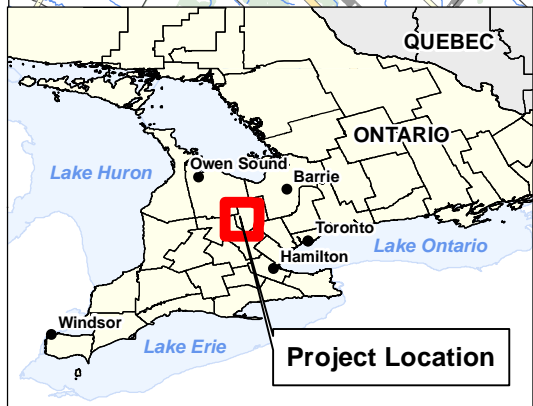
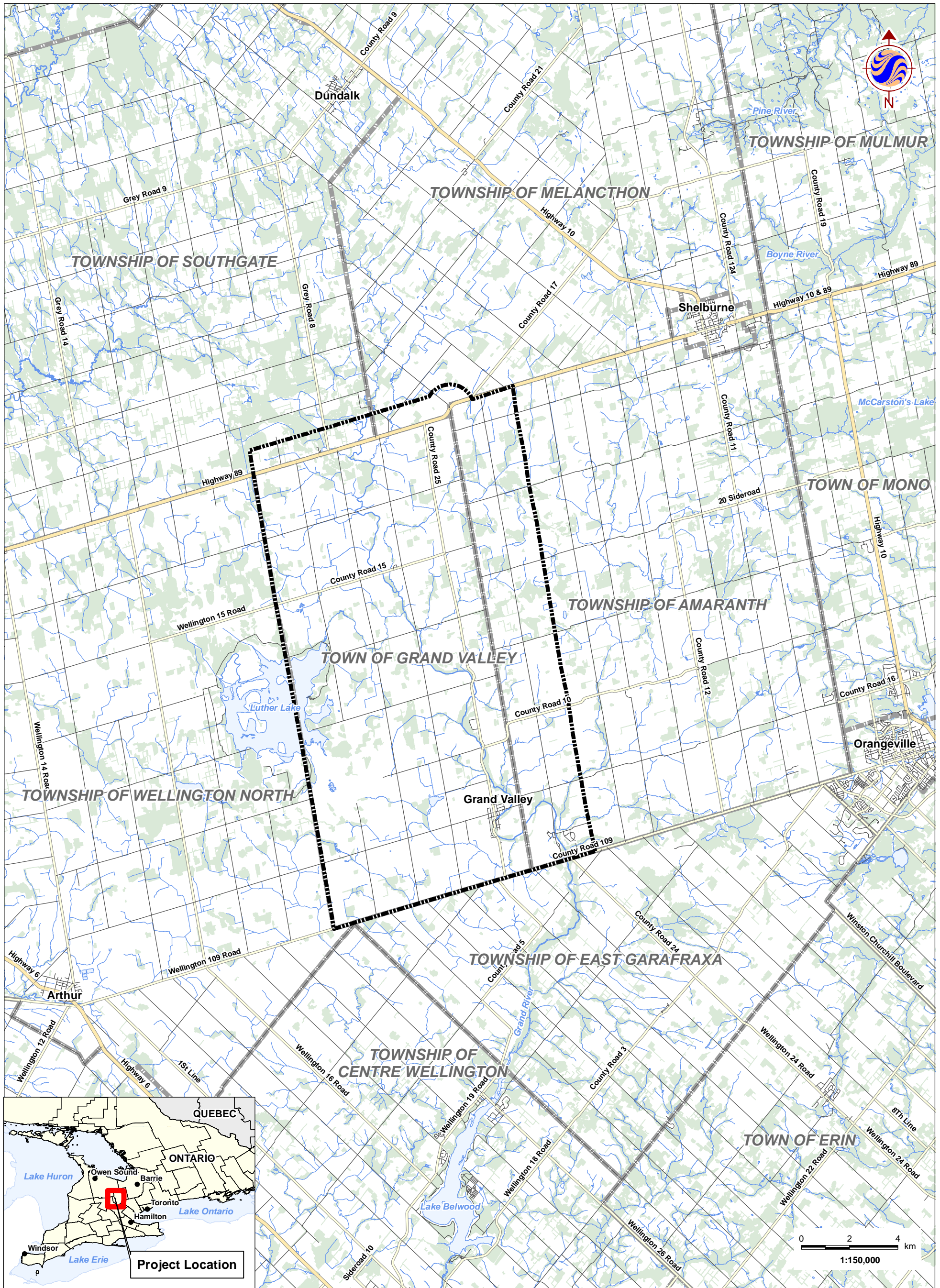
Shawna Peddle, MSc
Senior Project Manager



Mark Knight, MA, MCIP, RPP
Project Manager

Appendix A

Project Location and Site Plan



W:\active\60960698\drawing\MXD\FPC\AREA_Reports\160960698_Fig_1_ProjectLocation_20121212.mxd
 Revised: 2012-12-19 By: chharvey

December, 2012
160960698



Legend	
	Study Area
	Municipal Boundary
	Highway
	Waterbody
	Major Road
	Woodland
	Local Road
	Watercourse

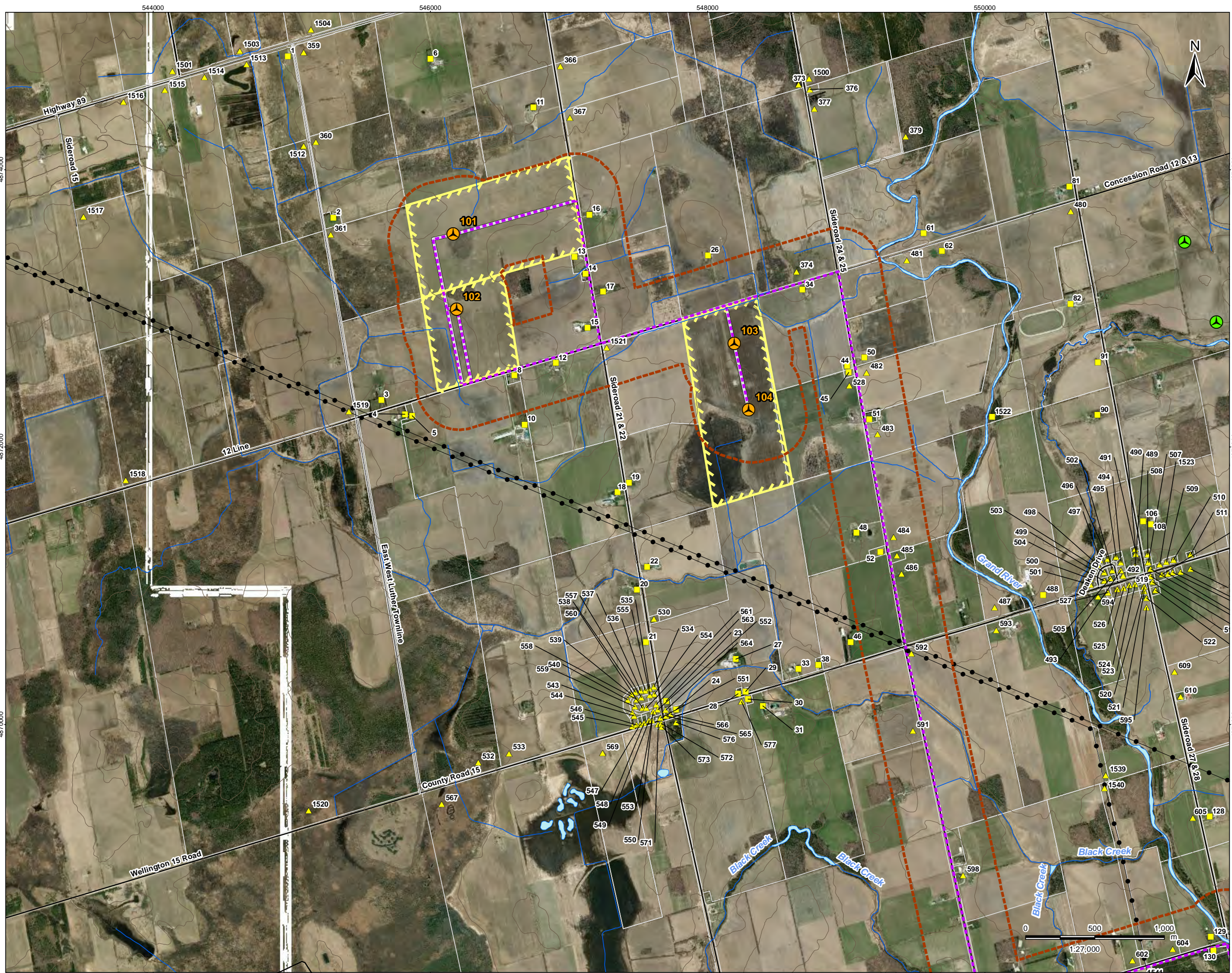
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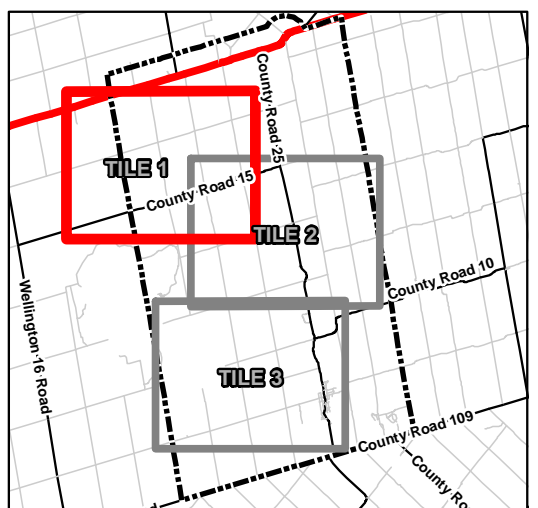
Client/Project
Grand Valley Phase 3
Veresen Inc.

Figure No.
1

Title
Project Study Area



- ### Legend
- 300m Zone of Investigation
 - Proposed Project Components**
 - Turbine
 - ★ Construction Trailer/ Parking Area (Previously Disturbed)
 - Access Roads
 - Collector Lines
 - Transformer Location/ HONI Connection Point/ Met Tower/ Construction Laydown
 - Participating Property
 - Other Crystallized/ Existing Turbines**
 - Grand Valley Phase 1 & 2
 - Melancthon Phase 1 & 2
 - Existing Features**
 - Hydro Line
 - Contours (5 Metre Interval)
 - Road
 - Watercourse (as per MNR base mapping)
 - Property Parcel
 - Waterbody (as per MNR base mapping)
 - Noise Receptors**
 - Participating
 - Non- Participating Occupied
 - ▲ Non- Participating Vacant
 - 483 Receptor ID



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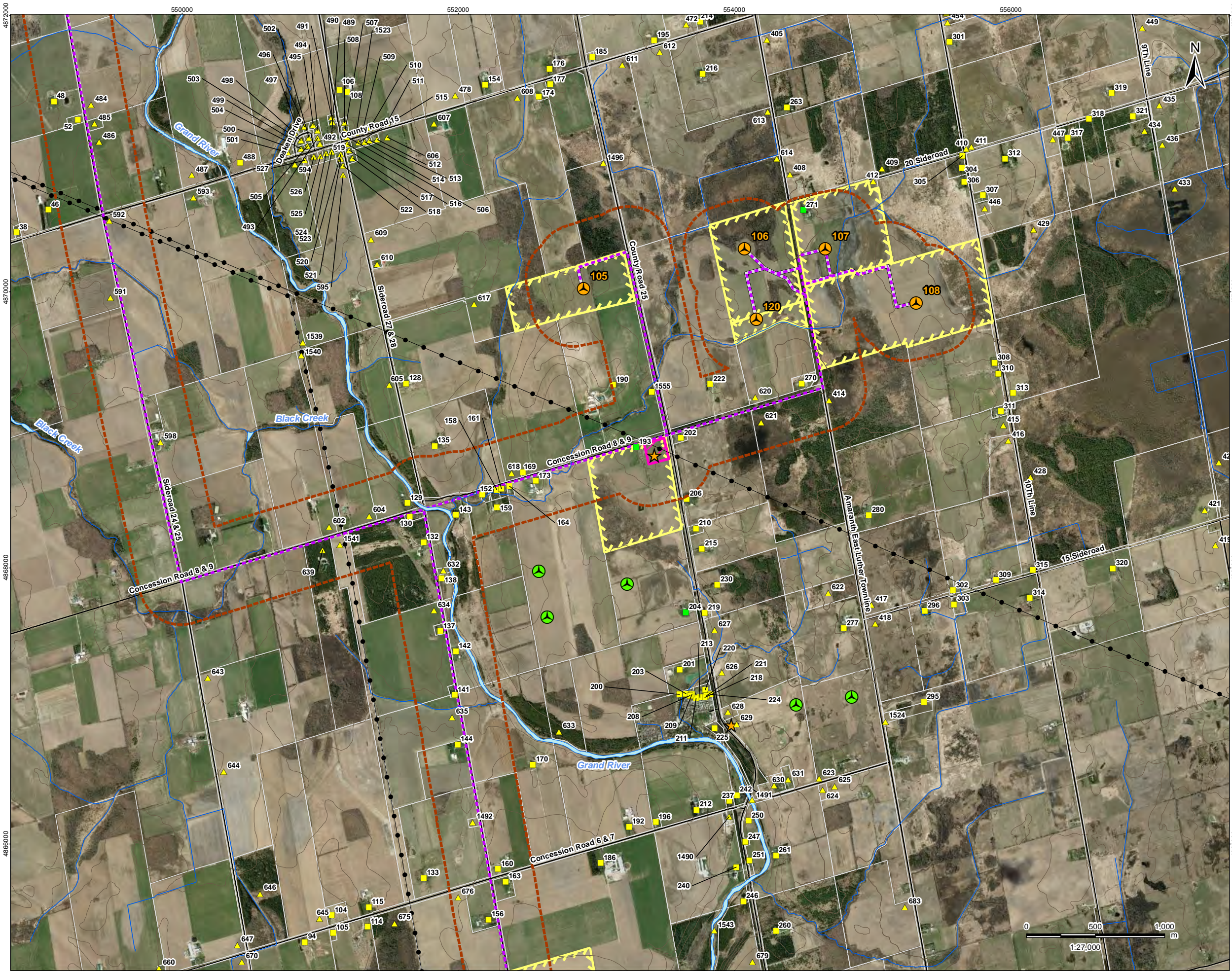
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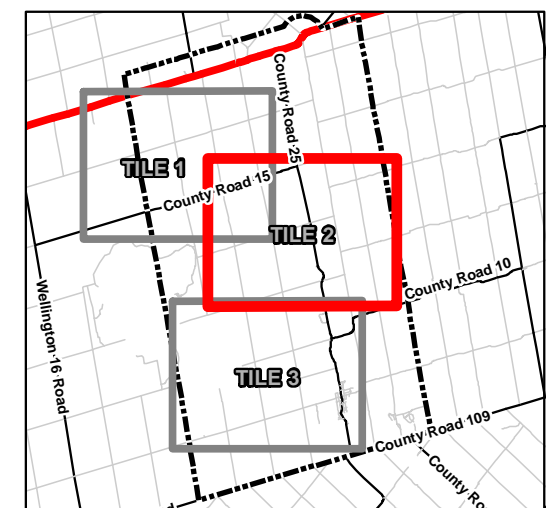
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Grand Valley Phase 3
Veresen Inc.

Figure No.
2

Title
**Project Location Mapbook
TILE 1**



- ### Legend
- 300m Zone of Investigation
 - Proposed Project Components**
 - Turbine
 - ★ Construction Trailer/ Parking Area (Previously Disturbed)
 - Access Roads
 - Collector Lines
 - Transformer Location/ HONI Connection Point/ Met Tower/ Construction Laydown
 - Participating Property
 - Other Crystallized/ Existing Turbines**
 - Grand Valley Phase 1 & 2
 - Melancthon Phase 1 & 2
 - Existing Features**
 - Hydro Line
 - Contours (5 Metre Interval)
 - Road
 - Watercourse (as per MNR base mapping)
 - Property Parcel
 - Waterbody (as per MNR base mapping)
 - Noise Receptors**
 - Participating
 - Non- Participating Occupied
 - ▲ Non- Participating Vacant
 - 483 Receptor ID



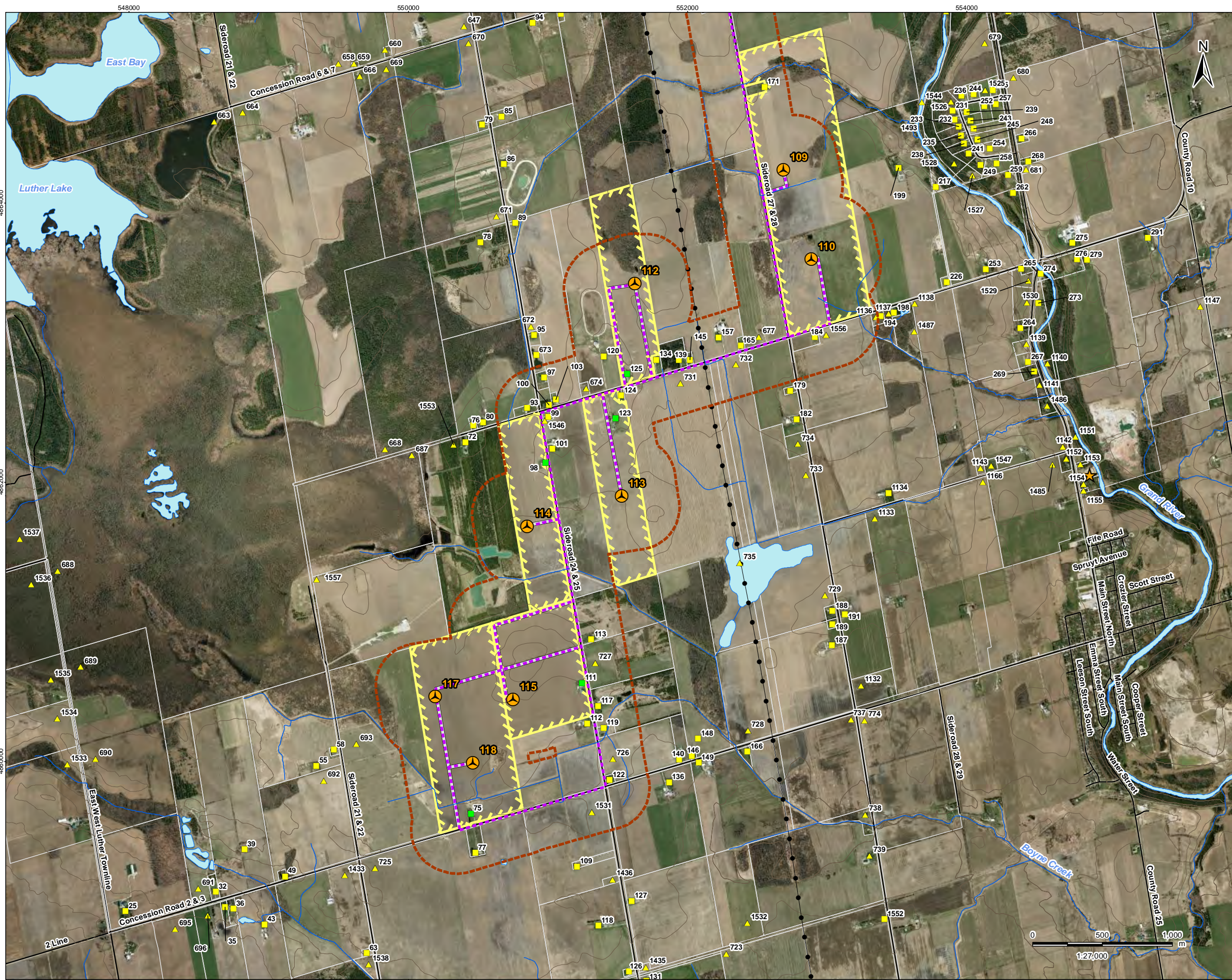
- ### Notes
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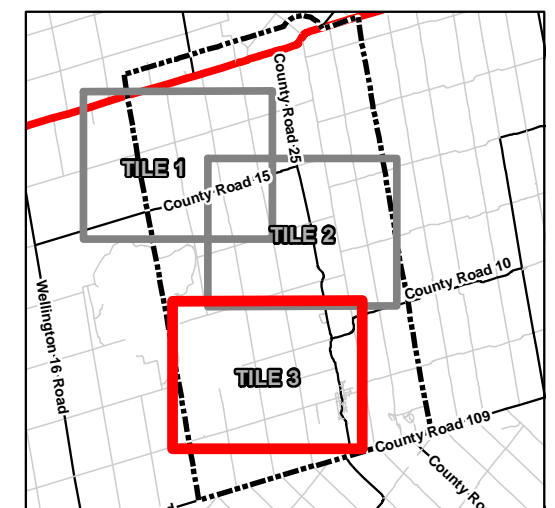
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 Grand Valley Phase 3
 Veresen Inc.

Figure No.
 2

Title
**Project Location Mapbook
 TILE 2**



- ### Legend
- 300m Zone of Investigation
 - Proposed Project Components**
 - Turbine
 - ★ Construction Trailer/ Parking Area (Previously Disturbed)
 - Access Roads
 - Collector Lines
 - Transformer Location/ HONI Connection Point/ Met Tower/ Construction Laydown
 - Participating Property
 - Other Crystallized/ Existing Turbines**
 - Grand Valley Phase 1 & 2
 - Melancthon Phase 1 & 2
 - Existing Features**
 - Hydro Line
 - Contours (5 Metre Interval)
 - Road
 - Watercourse (as per MNR base mapping)
 - Property Parcel
 - Waterbody (as per MNR base mapping)
 - Noise Receptors**
 - Participating
 - ▲ Non- Participating Occupied
 - ▲ Non- Participating Vacant
 - 483 Receptor ID



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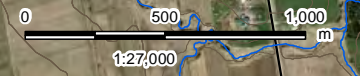
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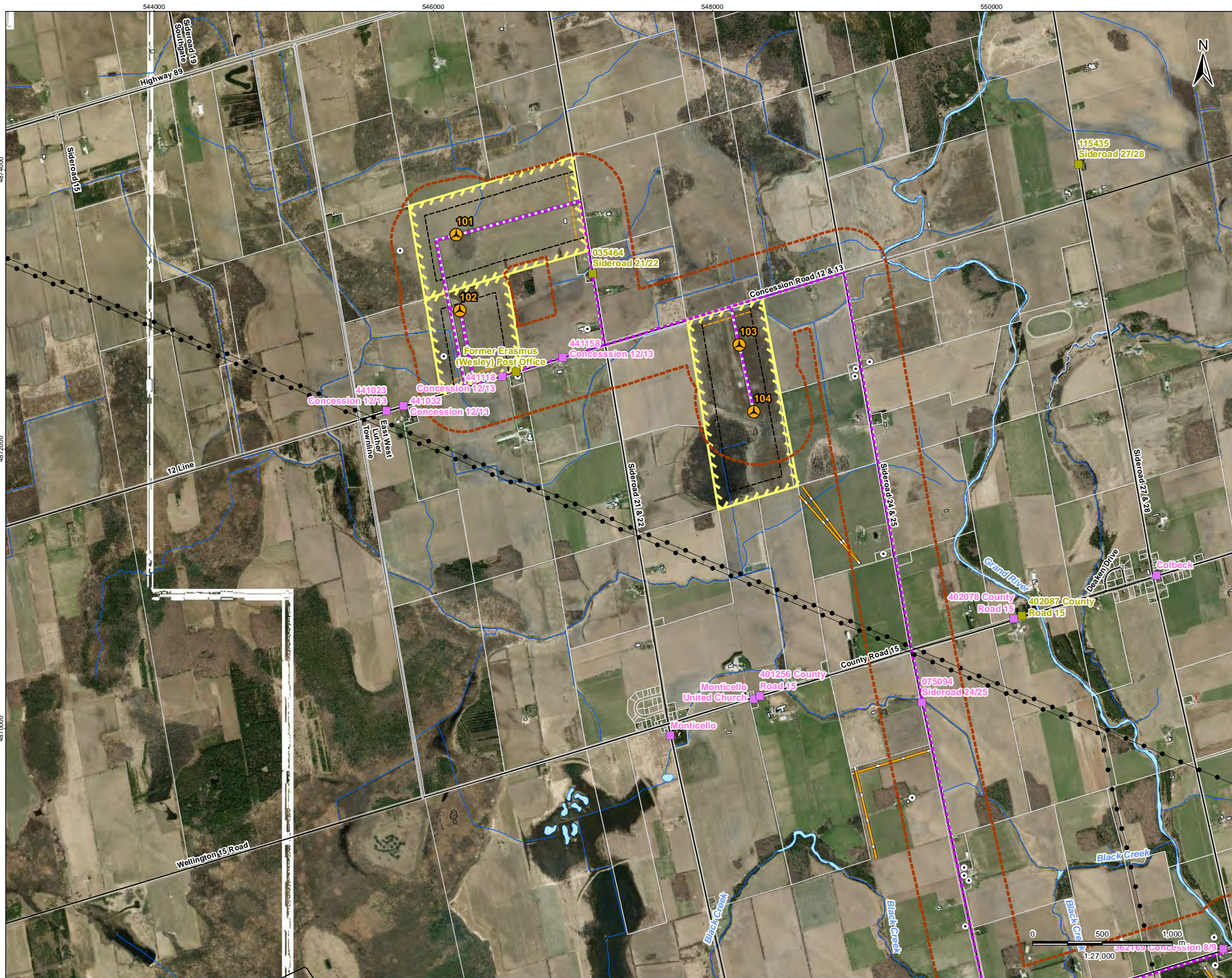
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Figure No.
2

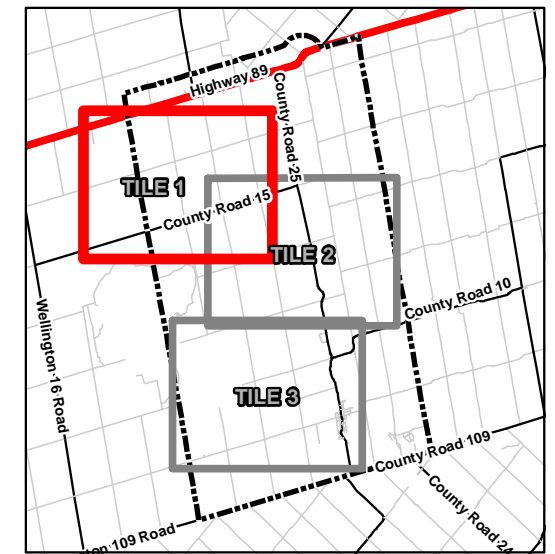
Title
**Project Location Mapbook
TILE 3**





Legend

- 300m Zone of Investigation
- Proposed Project Components**
- Turbine
- ★ Construction Trailer/ Parking Area (Previously Disturbed)
- Access Roads
- Collector Lines
- Transformer Location/ HONI Connection Point/ Met Tower/ Construction Laydown
- Participating Property
- Existing Features**
- Hydro Line
- Air Strip
- Road
- Watercourse (as per MNR base mapping)
- Buildings (as per MNR base mapping)
- Property Parcel
- Property Line - 100m Setback
- Public Road - 65.5m Setback
- Waterbody (as per MNR base mapping)
- Built Heritage Resource
- Cultural Heritage Landscape
- ▲ Landfill (MOE)
- Water Well Record (MOE)



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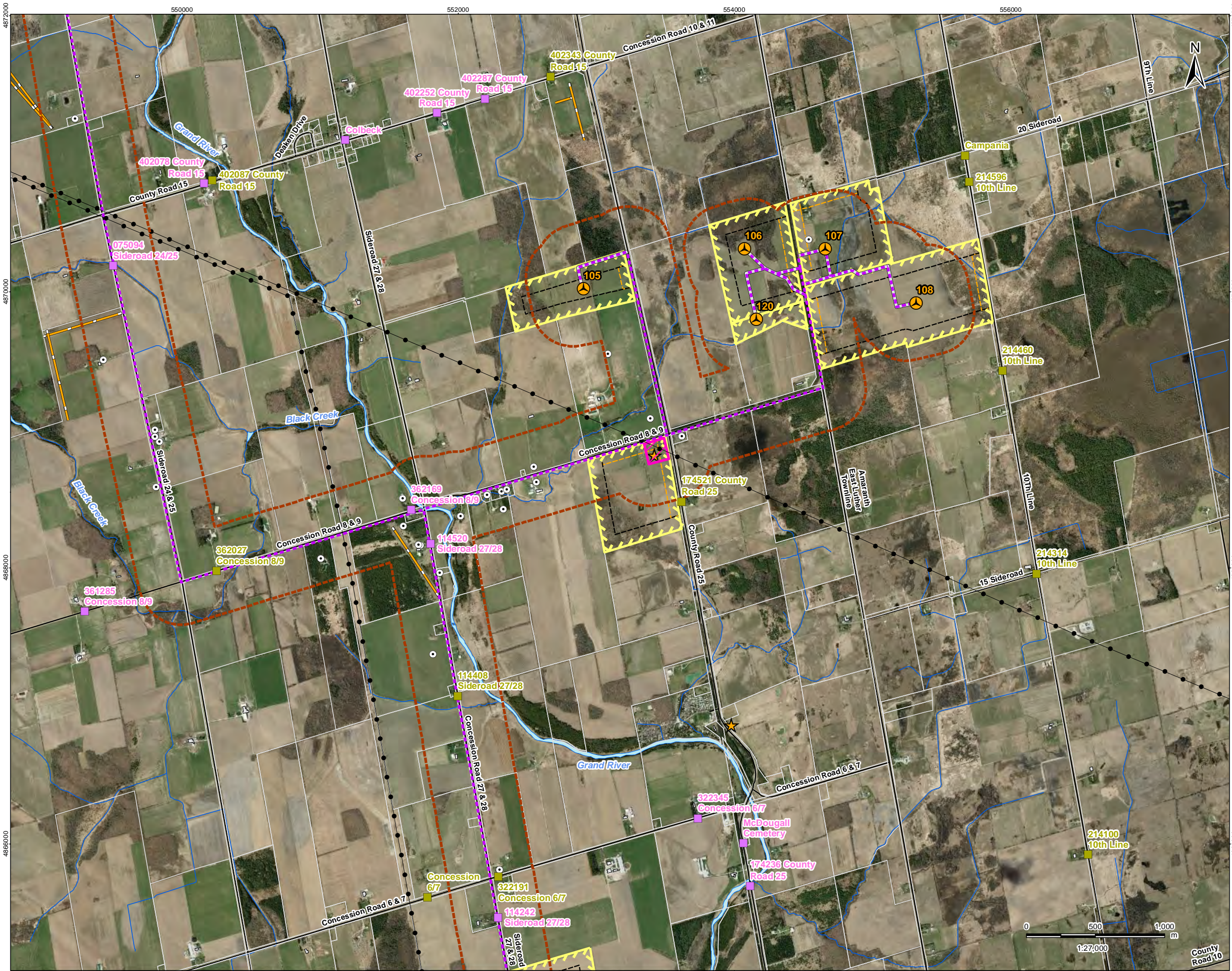
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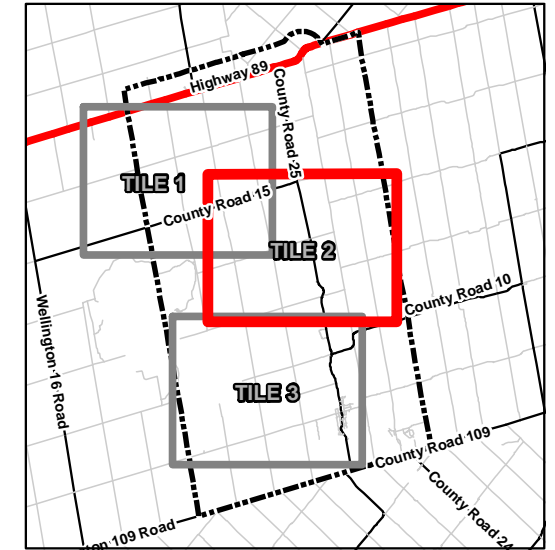
Figure No.
3

Title
**Socio-Economic Features
Mapbook
TILE 1**



Legend

- 300m Zone of Investigation
- Proposed Project Components**
- Turbine
- ★ Construction Trailer/ Parking Area (Previously Disturbed)
- Access Roads
- - - Collector Lines
- Transformer Location/ HONI Connection Point/ Met Tower/ Construction Laydown
- Participating Property
- Existing Features**
- Hydro Line
- Air Strip
- Road
- Watercourse (as per MNR base mapping)
- Buildings (as per MNR base mapping)
- Property Parcel
- Property Line - 100m Setback
- Public Road - 65.5m Setback
- Waterbody (as per MNR base mapping)
- Built Heritage Resource
- Cultural Heritage Landscape
- ▲ Landfill (MOE)
- Water Well Record (MOE)



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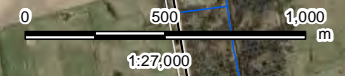
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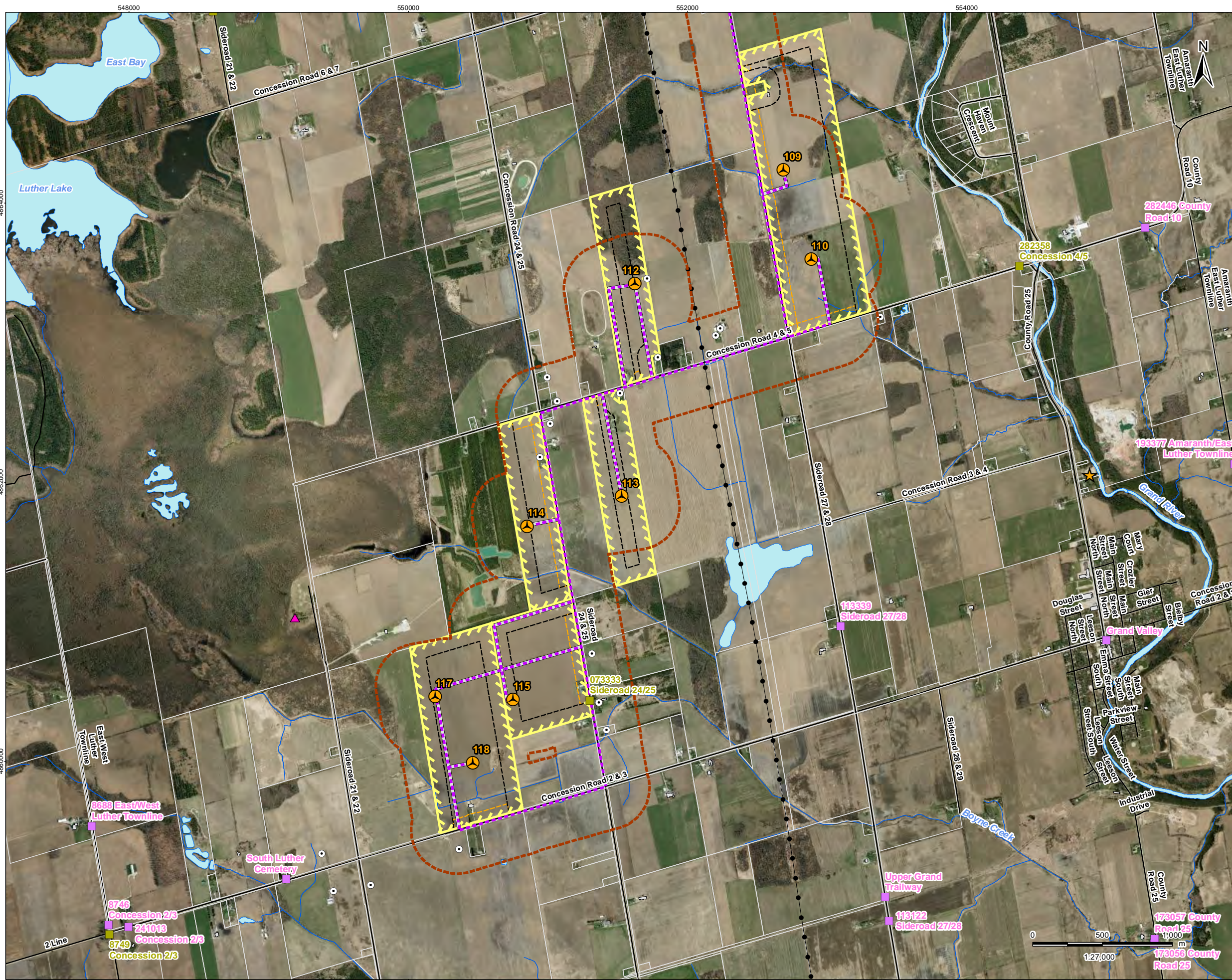
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Figure No.
3

Title
**Socio-Economic Features
Mapbook
TILE 2**





Legend

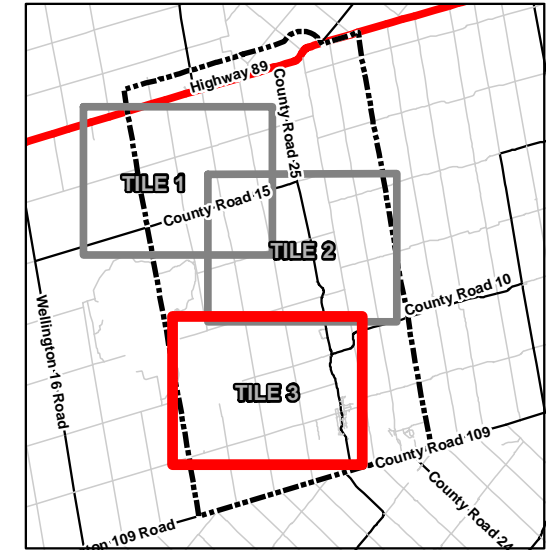
300m Zone of Investigation

Proposed Project Components

- Turbine
- Construction Trailer/ Parking Area (Previously Disturbed)
- Access Roads
- Collector Lines
- Transformer Location/ HONI Connection Point/ Met Tower/ Construction Laydown
- Participating Property

Existing Features

- Hydro Line
- Air Strip
- Road
- Watercourse (as per MNR base mapping)
- Buildings (as per MNR base mapping)
- Property Parcel
- Property Line - 100m Setback
- Public Road - 65.5m Setback
- Waterbody (as per MNR base mapping)
- Built Heritage Resource
- Cultural Heritage Landscape
- Landfill (MOE)
- Water Well Record (MOE)



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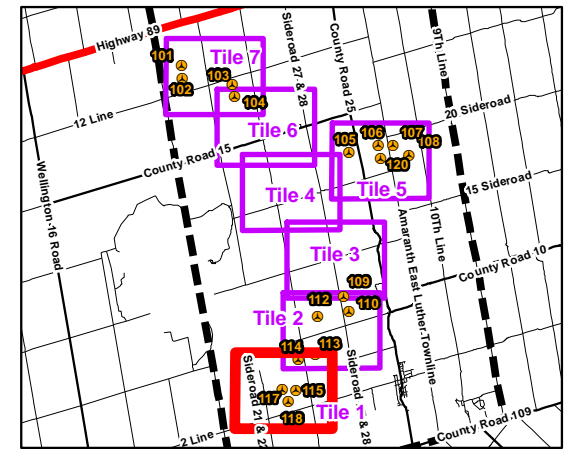
Figure No.
3

Title
**Socio-Economic Features
Mapbook
TILE 3**



Legend

- 120m Zone of Investigation
- 300m Zone of Investigation
- Proposed Project Components**
- Turbines
- Access Roads
- Collector Lines
- Collector Line ROW
- Transformer Location/
HONI Connection Point/
Met Tower/ Construction
Laydown
- Turbine Blade Reach (56.5m)
- Turbine Construction Area
- Turning Area
- Optioned Property
- Existing Features**
- Road
- Constructed Drain
- Watercourse
- Waterbody
- Natural Features**
- Candidate Significant Woodland
- Wildlife Habitat
- Wetland Feature
- Water Body Status**
- REA Water Body/ Fish Habitat
- Not REA Water Body



Notes

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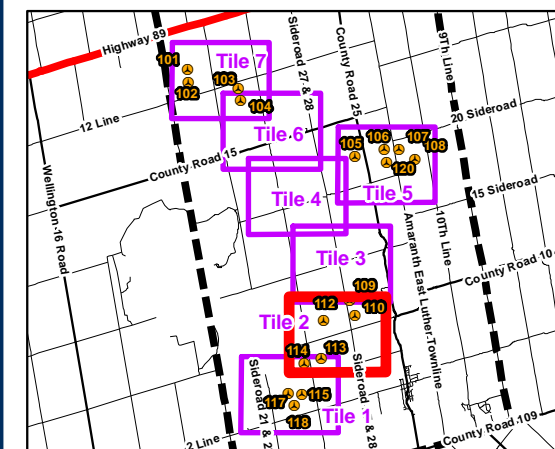
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4.1

Title
**Aquatic & Natural Heritage Features
- Field Review
Tile 1 of 7**



Legend

- 120m Zone of Investigation
- 300m Zone of Investigation
- Proposed Project Components**
- Turbines
- Access Roads
- Collector Lines
- Collector Line ROW
- Transformer Location/
HONI Connection Point/
Met Tower/ Construction
Laydown
- Turbine Blade Reach (56.5m)
- Turbine Construction Area
- Turning Area
- Optioned Property
- Existing Features**
- Road
- Constructed Drain
- Watercourse
- Waterbody
- Natural Features**
- Candidate Significant Woodland
- Wildlife Habitat
- Wetland Feature
- Water Body Status**
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- Not REA Water Body



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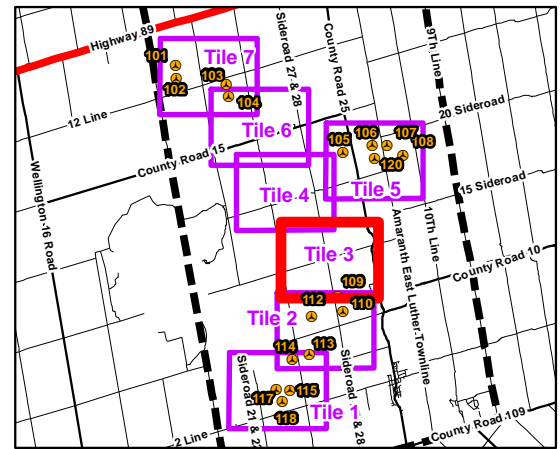
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4.1

Title
**Aquatic & Natural Heritage Features
- Field Review
Tile 2 of 7**



Legend

- 120m Zone of Investigation
- 300m Zone of Investigation
- Proposed Project Components**
- Turbines
- Access Roads
- Collector Lines
- Collector Line ROW
- Transformer Location/
HONI Connection Point/
Met Tower/ Construction
Laydown
- Turbine Blade Reach (56.5m)
- Turbine Construction Area
- Turning Area
- Optioned Property
- Existing Features**
- Road
- Constructed Drain
- Watercourse
- Waterbody
- Natural Features**
- Candidate Significant Woodland
- Wildlife Habitat
- Wetland Feature
- Water Body Status**
- REA Water Body/ Fish Habitat
- Not REA Water Body



Notes

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April 2013
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Grand Valley Phase 3
Veresen Inc.

Figure No.

4.1

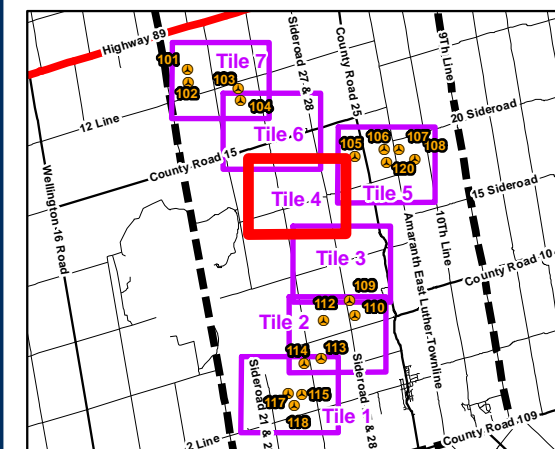
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**Aquatic & Natural Heritage Features
- Field Review
Tile 3 of 7**



Legend

- 120m Zone of Investigation
- 300m Zone of Investigation
- Proposed Project Components**
- Turbines
- Access Roads
- Collector Lines
- Collector Line ROW
- Transformer Location/ HONI Connection Point/ Met Tower/ Construction Laydown
- Turbine Blade Reach (56.5m)
- Turbine Construction Area
- Turning Area
- Optioned Property
- Existing Features**
- Road
- Constructed Drain
- Watercourse
- Waterbody
- Natural Features**
- Candidate Significant Woodland
- Wildlife Habitat
- Wetland Feature
- Water Body Status**
- REA Water Body/ Fish Habitat
- Not REA Water Body



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.
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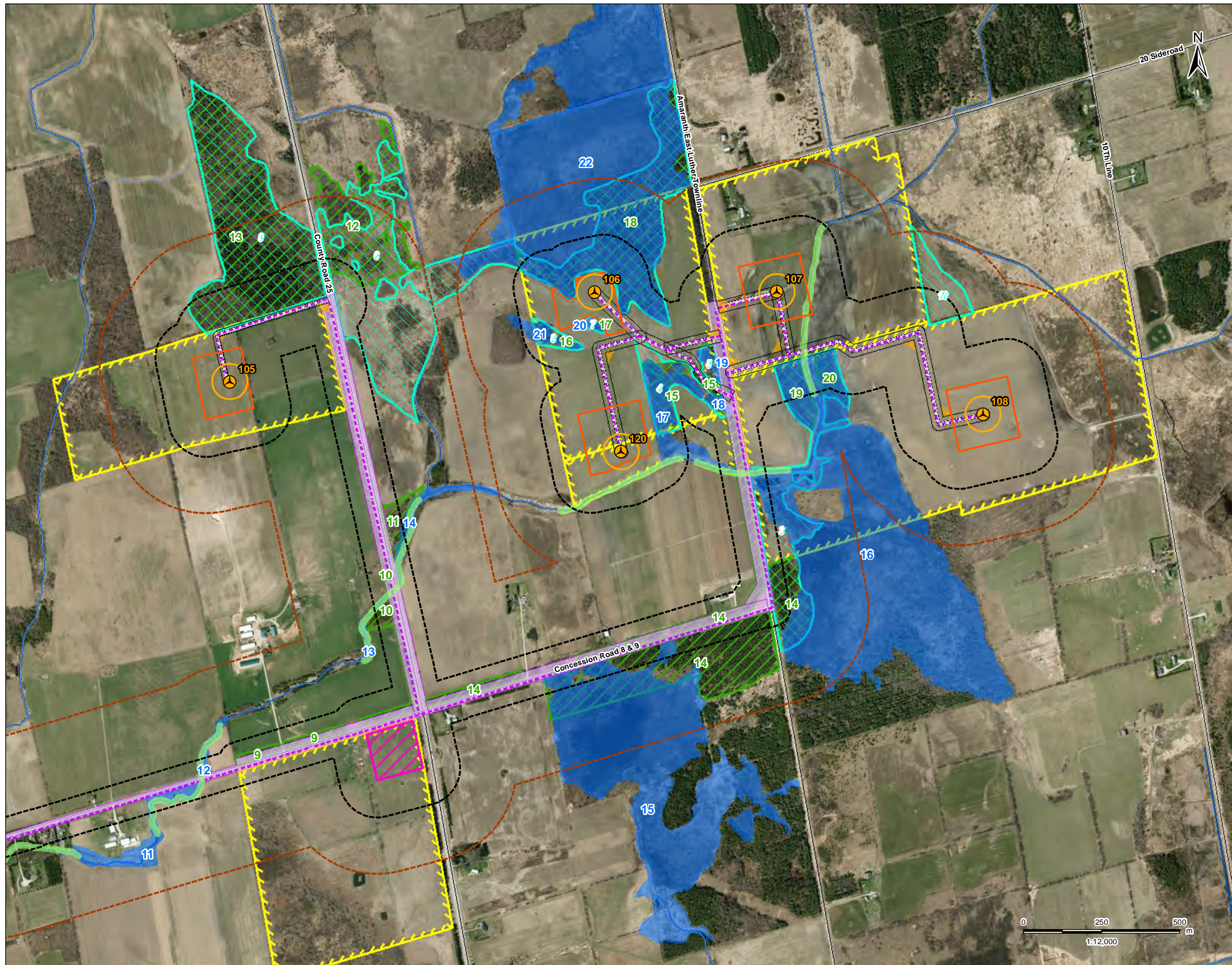
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Veresen Inc.

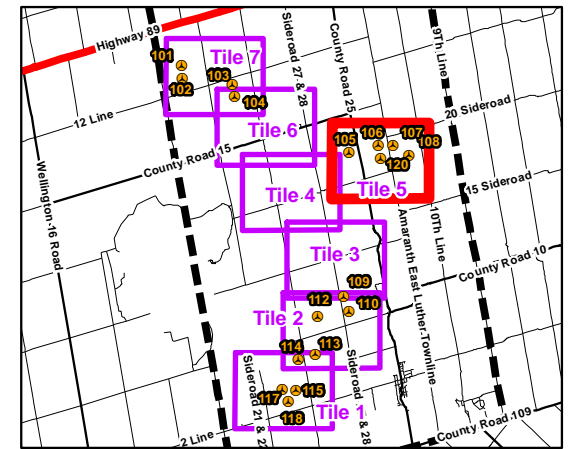
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4.1

Title
**Aquatic & Natural Heritage Features
- Field Review
Tile 4 of 7**



Legend

- 120m Zone of Investigation
- 300m Zone of Investigation
- Proposed Project Components**
- Turbines
- Access Roads
- Collector Lines
- Collector Line ROW
- Transformer Location/
HONI Connection Point/
Met Tower/ Construction
Laydown
- Turbine Blade Reach (56.5m)
- Turbine Construction Area
- Turning Area
- Optioned Property
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- Road
- Constructed Drain
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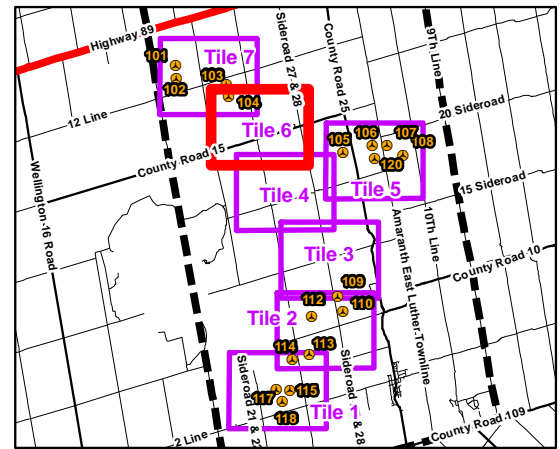
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4.1

Title
**Aquatic & Natural Heritage Features
- Field Review
Tile 5 of 7**



Legend

- 120m Zone of Investigation
- 300m Zone of Investigation
- Proposed Project Components**
- Turbines
- Access Roads
- Collector Lines
- Collector Line ROW
- Transformer Location/HONI Connection Point/Met Tower/Construction Laydown
- Turbine Blade Reach (56.5m)
- Turbine Construction Area
- Turning Area
- Optional Property
- Existing Features**
- Road
- Constructed Drain
- Watercourse
- Waterbody
- Natural Features**
- Candidate Significant Woodland
- Wildlife Habitat
- Wetland Feature
- Water Body Status**
- REA Water Body/ Fish Habitat
- Not REA Water Body



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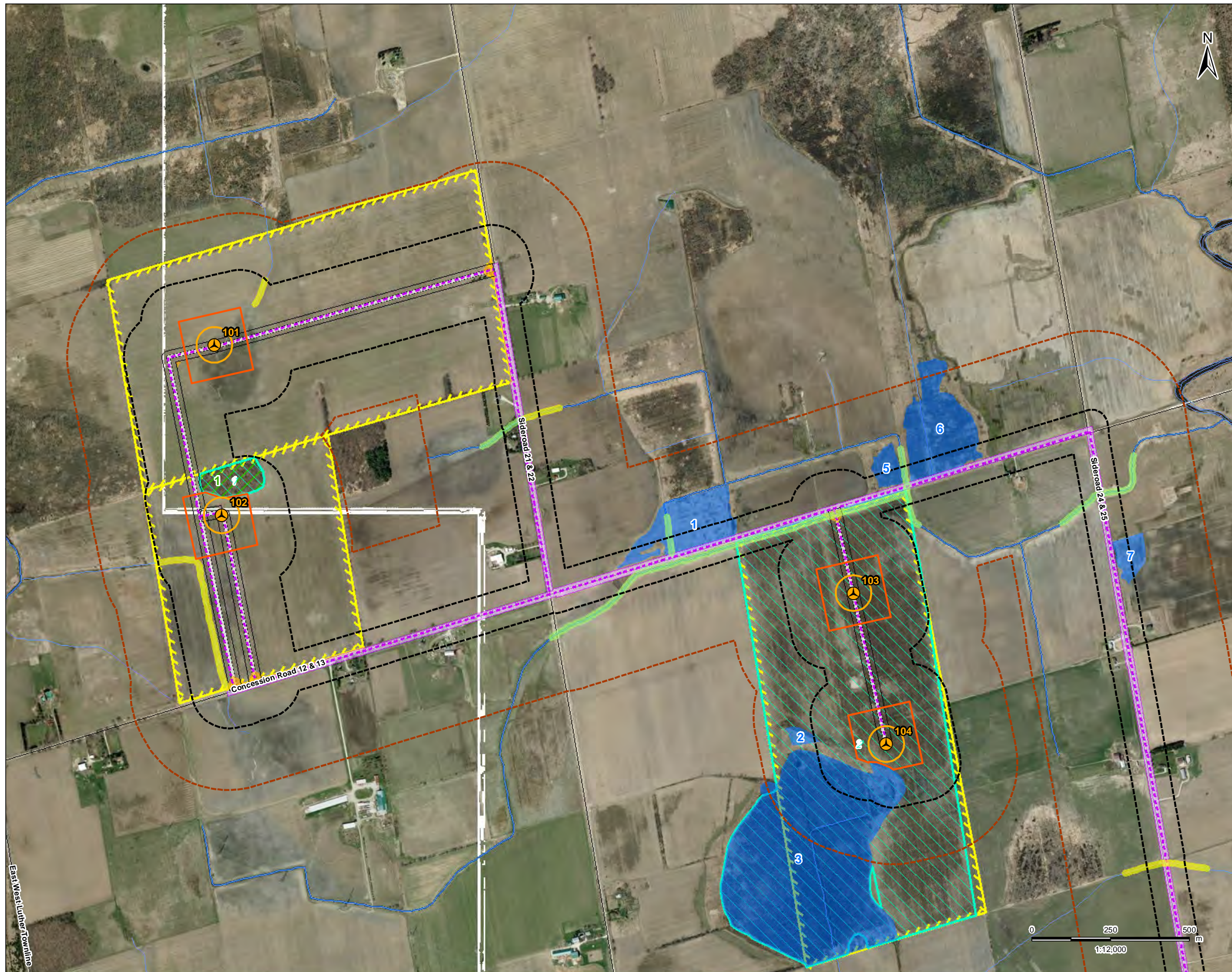
Grand Valley Phase 3
Veresen Inc.

Figure No.

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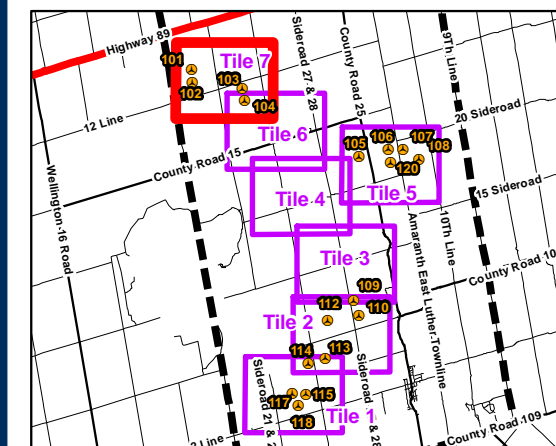
Title

**Aquatic & Natural Heritage Features
- Field Review
Tile 6 of 7**



Legend

- 120m Zone of Investigation
- 300m Zone of Investigation
- Proposed Project Components**
- Turbines
- Access Roads
- Collector Lines
- Collector Line ROW
- Transformer Location/
HONI Connection Point/
Met Tower/ Construction
Laydown
- Turbine Blade Reach (56.5m)
- Turbine Construction Area
- Turning Area
- Optioned Property
- Existing Features**
- Road
- Constructed Drain
- Watercourse
- Waterbody
- Natural Features**
- Candidate Significant Woodland
- Wildlife Habitat
- Wetland Feature
- Water Body Status**
- REA Water Body/ Fish Habitat
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Notes

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Figure No.

4.1

Title

**Aquatic & Natural Heritage Features
- Field Review
Tile 7 of 7**

Appendix B

Overview of Potential Environmental Effects

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
<i>Heritage and Archaeological Resources</i>			
Heritage Resources	<ul style="list-style-type: none"> • Potential negative impact from vibration caused by construction activities. • Potential visual impact. 	<ul style="list-style-type: none"> • Avoid construction activities within 60 m of any structures associated with identified cultural heritage resources. • A qualified engineer would determine acceptable levels of vibration for subject properties, if construction within 60 m cannot be avoided. • Monitor vibrations during sub-grade activities within 60 m of identified cultural heritage resources. • Halt activities if vibration levels exceed maximum thresholds, until a suitable solution can be identified. • Avoid travel through the cultural heritage landscapes in the communities of Grand Valley, Monticello and Colbeck to the greatest extent practicable when transporting heavy machinery and turbine components. • Avoid removal of trees in the vicinity of identified properties and cultural landscapes, and avoid damaging tree roots. • Work with the Town of Grand Valley to determine if a visual barrier (e.g. fencing, tree plantings) should be installed to protect the cultural heritage values of the cemetery. 	None
Archaeological Resources	<ul style="list-style-type: none"> • Potential discovery of archaeological resources during excavation. 	<ul style="list-style-type: none"> • Stage 1 and 2 archaeological assessments have been undertaken. • Construction Contractor would be notified of the stop work protocol should artefacts and/or human remains be encountered during excavation as described in the <u>Construction Plan Report</u>. 	None
<i>Natural Heritage Resources</i>			
Wetlands	<ul style="list-style-type: none"> • No direct loss of wetland habitat or function as a result of the Project. • Localized dust generation, soil erosion and sedimentation, root zone damage to edge trees (soil compaction), changes to wetland hydrology either by increasing or 	<ul style="list-style-type: none"> • Mitigation measures for spills and waste are detailed under 'Waste Management and Contaminated Lands'. • Disturbed areas in wetlands 6 and 7 would be reseeded with a native wetland grass mix. Reseeded areas would be monitored for one year to ensure regeneration success. • Proposed mitigation for each wetland feature can be found in the NHA/EIS, Section 5.5. • Where possible, and as appropriate, access roads would be 	None

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	<p>decreasing surficial runoff and disturbance to wetland wildlife.</p> <ul style="list-style-type: none"> • During construction, there would be increased traffic and the potential for accidental spills. 	<p>constructed at or near existing grade to maintain surface flow contributions.</p> <ul style="list-style-type: none"> • A sediment and erosion protection plan would be put in place, including identification of specific locations for material stock-piling and maintenance activities to isolate any spills from the wetland. In the event of an accidental spill, the MOE Spills Action Centre would be contacted and emergency spill procedures implemented immediately. • Installation of sediment control measures, which may include perimeter silt fencing, mud mats (access roads), check dams (rock or straw bales), and sediment bags (dewatering); • Silt barriers (e.g., fencing) would be erected along wetland and woodland community edges located within 30 m of construction areas (including staging areas and laydown areas) to minimize potential sediment transport to the significant natural features. These barriers would be regularly monitored and properly maintained during and following construction until soils in the construction area are re-stabilized with vegetation. • Where culverts are proposed within 30 m of a significant natural feature, enhanced sediment and erosion control measure (i.e. straw bales, double rows of sediment fencing, check dams) would be installed as added protection to filter runoff and further minimize potential sedimentation within the downstream features (wetland, woodland). This added protection is proposed to reduce environmental risk. • The area to be used for dewatering would be clearly marked with flagging and/or snow-fencing prior to work commencing; • During site preparation, silt fencing would be included to retain sediments on site so they do not enter any significant natural feature. All sediment control structures would be inspected regularly, and repaired/maintained as necessary; • All water pumped during dewatering activities would be directed away from significant natural features and not directly into wetlands; 	

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		<ul style="list-style-type: none"> • Sediment bags (or filter rings) would be used as appropriate to filter out suspended sediment prior to discharge. Any sediment bags or filter rings would be monitored during pumping to ensure their efficacy, with any clogging or failures to be rectified immediately; and • After the staging area and dewatering work area is no longer required, any remaining disturbed soils would be returned to pre-disturbance conditions and/or reseeded. • Where collector lines overlap wetlands, directional drill methods of installation will minimize direct loss of the feature. 	
Areas of Natural and Scientific Interest (ANSIs)	<ul style="list-style-type: none"> • Degradation and erosion of soils, loss of landscape form and potential changes to hydrological drainage patterns. 	<ul style="list-style-type: none"> • The limit of the construction area would be staked and flagged prior to construction. • Access roads would be constructed at grade. • Excavation of soils for the purpose of turbine and underground collector system installation would be filled as quickly as practicable to grade. Excess soil would be re-used on site as feasible and applicable. Where there is a risk of soil migration into a nearby watercourse, excavated soils would be stockpiled, stabilized and silt-fencing would be installed as appropriate. • After turbines have been assembled, the temporary turbine construction area would be restored to an acceptable condition to meet municipal zoning by-law requirements at the time and to the satisfaction of the landowners, as soon as practical. 	None
Valleylands	<ul style="list-style-type: none"> • Short-term, localized dust generation, soil erosion and sedimentation. • The use of construction equipment creates the potential for negative effects related to chemical and/or fuel spills. 	<ul style="list-style-type: none"> • Mitigation measures for spills and waste are detailed under 'Waste Management and Contaminated Lands'. 	None
Woodlands	<ul style="list-style-type: none"> • No direct loss of woodland habitat or function as a result of the Project. • Short-term, localized dust 	<ul style="list-style-type: none"> • Mitigation measures for spills and waste are detailed under 'Waste Management and Contaminated Lands'. • Mitigation measures for vegetation removal as outlined in Section 5.5 in the NHA/EIS. 	Indirect impacts anticipated to be minimal to none, and mitigable through the use of standard site control

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	<p>generation, soil erosion and sedimentation, root zone damage to edge trees and disturbance to wildlife.</p> <ul style="list-style-type: none"> • Soil migration associated with excavation, soil compaction from heavy equipment, potential changes in hydrological low/drainage. • Trenching, which is required to install the underground collector system, has the potential to injure roots that might extend from trees located along the edge of the woodland boundary. 	<ul style="list-style-type: none"> • Excavation of soils for the purpose of underground collector system installation would occur at the minimum distance of 5 m from the woodland boundary (drip line). • As appropriate, and prior to construction, the limits of vegetation clearing would be staked in the field. The Construction Contractor would ensure that no construction disturbance occurs beyond the staked limits and that edges of sensitive areas adjacent to the work areas are not disturbed. Regular monitoring of the limits of clearing would be implemented to ensure the objective of minimal disturbance. Should monitoring reveal that clearing occurred beyond defined limits, mitigation action would be taken that could include rehabilitation of the disturbed area to pre-disturbance conditions at the direction of a qualified ecologist (with enhancement of any disturbed areas). • To the extent practical, tree and/or brush clearing and grassland removal would be completed prior to, or after, the core nesting season for migratory birds (May 1 to July 31). Should clearing be required during the breeding bird season, prior to construction, surveys would be undertaken by a qualified biologist to identify the presence/absence of nesting birds or breeding habitat. If a nest is located, a designated buffer would be marked off within which no construction activity would be allowed while the nest is active. The radius of the buffer would range from 5 - 60 m, depending on the species. Buffer widths are based on the species' sensitivity and on buffer width recommendations that have been reviewed and approved by Environment Canada. • Prior to the start of construction activity, the topsoil/seedbank would be stripped and preserved; material would be reapplied in suitable rehabilitation areas post construction. • Excavated soil from crane pads would be re-used on site, as feasible. If not feasible, the soil would be disposed of at an approved off-site facility. Temporary laydown areas would be returned to pre-construction conditions. • Following construction, topsoil in areas of temporary 	<p>measures.</p>

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		disturbance would be replaced/restored. Disturbed areas in agricultural fields would be reseeded to an acceptable condition to meet municipal zoning by-law requirements at the time and to the satisfaction of the landowners • Additional mitigation measures can be found in the <u>Construction Plan Report</u> .	
Provincial Parks and Conservation Reserves	• No features identified within 300 m of the Project Location.	• N/A	N/A
Significant Wildlife Habitat <ul style="list-style-type: none"> • Amphibian Breeding (Wetland) • Bat Maternity Colonies • Marsh Bird Breeding • Turtle Nesting Areas • Waterfowl Stopover and Staging (Aquatic) • Waterfowl Stopover and Staging (Terrestrial) • Waterfowl Nesting Area 	<ul style="list-style-type: none"> • Short-term disturbance from construction activity, such as increased traffic and noise may also result in avoidance of habitats. • Short-term sensory disturbance to species using these areas, localized dust generation, soil erosion. • Short-term, localized dust generation, soil erosion and sedimentation. • Sedimentation and chemical or fuel spills. • Amphibians are at an increased risk from vehicle collisions in spring. • Snapping turtles are at an increased risk from vehicle collisions. • Removal of vascular plants and portions of plant communities. • Potential loss of species diversity, fragmentation of habitat, spread of invasive species and temporary disruption to movement of wildlife. 	<ul style="list-style-type: none"> • Turtle barrier fencing is proposed around the construction zone to prevent turtles and other wildlife from interacting with the Project. Provided fence is constructed to suitable specifications and maintained in good repair, direct impacts to spring-emerging turtles are very unlikely. Erosion control fencing is suitable for this purpose and also protects the aquatic feature from sediment laden runoff. • If construction is to proceed during the breeding window (approximately mid-March to early-April), the site should be cleared and barrier fencing should be established prior to March to prevent interaction with nesting waterfowl. Alternatively the site can be inspected by a qualified biologist to document any nesting activity and direct protection measures, such as spatial and timing restrictions. • Barrier fencing is proposed around the construction zone to prevent amphibians and other species from interacting with the Project. Provided the fence is constructed to suitable specifications and maintained in good repair, direct impacts to amphibians are very unlikely. Erosion control fencing is suitable for this purpose and also protects the aquatic feature from sediment laden runoff. • In the event tree and or habitat removal is required in the 54 sq. m, suitable compensation would include post-construction restoration of an equivalent area (54 sq. m) and or number of trees to support SWH1 or another feature in the Project Study Area. Any such compensation efforts should occur under the direction of a qualified ecologist. 	<ul style="list-style-type: none"> • No adverse net effects on significant wildlife and wildlife habitat are anticipated during construction of the Project. • Some limited amphibian mortality is possible. • Potential long term effects to wildlife populations are anticipated to be minimal. • Effects expected to be short-term in duration and spatially limited to the work areas and their immediate vicinity.

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		<ul style="list-style-type: none"> • Mitigation will include identification of Short-eared Owl breeding territories and curtailment of some construction activities within the breeding territories from mid-March through to end of July. Curtailment would include avoidance of the use of heavy equipment in a potential breeding territory during the early nesting stage, from mid-March through end of May. Following this period, nesting Short-eared Owls are likely to be less susceptible to disturbance. However, construction activities will be avoided at dawn and dusk, to mitigate potential avoidance impacts to hunting owls. • A qualified biologist will conduct targeted Short-eared Owl surveys in proximity to Project components to identify potential nesting territories. Where territories have been identified in the same year as construction, weekly monitoring will be undertaken to measure potential avoidance behavior by Short-eared Owls, with weekly reports of the findings to MNR. If deemed necessary, additional adaptive management will be implemented in consultation with MNR. • Where the separation distance between significant wildlife areas and the Project site perimeter is 30 m or less, the significant wildlife areas would be well demarcated with fencing such that all construction activities and personnel are excluded from these areas. • To the extent practical, vegetation clearing would be completed prior to or after the breeding season for migratory birds (May 1st to July 31st). Should vegetation clearing be required during the breeding bird season, prior to construction, surveys would be undertaken to identify the presence/absence of nesting birds. If a nest is located, a designated buffer would be marked off to ensure no construction activity would be allowed while the nest is active. The radius of the buffer widths vary and would be determined in consultation with the MNR. • Any vegetation removal required along roadside collector lines should be minimized, and occur entirely within the road right-of-way. 	

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		<ul style="list-style-type: none"> • Any accidentally damaged trees should be pruned through the implementation of proper arboricultural techniques. • Re-vegetate temporary access roads or crane paths to pre-construction conditions as soon as possible. • Maintain existing vegetation buffers around water bodies • Restore and re-vegetate entry/exit pits to pre-construction conditions as soon as possible after construction. • Additional mitigation measures can be found in the <u>Construction Plan Report</u>. 	
Water Bodies and Aquatic Resources			
Groundwater	<ul style="list-style-type: none"> • Some dewatering activity possible during excavations; would not exceed 50,000 litres (L) per day. • Potential impact to water wells. • Potential for contamination through accidental spills. 	<ul style="list-style-type: none"> • Mitigation measures for dewatering are provided in Section 3.3. • If wells are encountered during construction, the Construction Contractor may, at the landowner's request, test pre-and post-construction water quality to ensure there is no impact to well water quality. • In the event that well water quality is impacted as a result of construction, GVWF would provide a temporary potable water supply until corrective measures are taken and would comply with MOE's Guideline B-9: Resolution of Groundwater Interference Problems. • As per S.13 of the Environmental Protection Act, all spills that could potentially have an adverse environmental effect, are outside the normal course of events, or are in excess of the prescribed regulatory levels would be reported to the MOE's Spills Action Centre by the Construction Contractor. • An Emergency Response Plan would be developed and would include protocols for the proper handling of material spills and associated procedures to be undertaken in the event of a spill. 	Any potential effects would be short term in nature and have little to no effect on groundwater flow conditions or adjacent private water wells.
Surface Water, Fish and Fish Habitat	<ul style="list-style-type: none"> • Construction activities could impact watercourses, including vegetation removal, removal and reinstallation of existing culverts, installation of new culverts and 	<ul style="list-style-type: none"> • All in-water work would be completed within MNR timing windows to protect local fish populations during their spawning and egg incubation periods. A typical construction timing window for warmwater streams in Guelph District is July 1 to March 15. 	Any potential net effects would be spatially and temporally limited.

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	<p>placement of underground collector lines.</p> <ul style="list-style-type: none"> • Short-term increase in turbidity from runoff and soil erosion during construction. • Loss of shade. • Reduced bank stability. • Reduced allochthonous inputs. • Water quality and habitat disturbance effects to aquatic habitat. • Culvert installations may enclose portions of a watercourse, cause loss of bed material within the length of the culvert and cause changes to riparian vegetation within the road allowance. • Installation of underground collector lines may also cause the collapse of the punch or bore hole under a stream, and disturb riparian vegetation as well as bottom and bank substrates resulting in disturbance to fish and fish habitat. • Permanent enclosure of portions of a watercourse. • Loss of bed material within the length of the culvert. • Changes to riparian vegetation within road allowance. • Potential for accidental spills. 	<ul style="list-style-type: none"> • All materials and equipment used for site preparation and Project construction would be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the water: <ul style="list-style-type: none"> – Any stockpiled materials would be stored and stabilized away from the water; – Refuelling and maintenance of construction equipment would occur a minimum of 100 m from a water body; – As appropriate, spills would be reported to the MOE Spills Action Centre by the Construction Contractor; – Any part of equipment entering the water would be free of fluid leaks and externally cleaned/degreased to prevent any deleterious substance from entering the water; and – Only clean material, free of fine particulate matter would be placed in the water. • Silt fencing and/or barriers would be used along all construction areas adjacent to water bodies; • No equipment would be permitted to enter any water bodies beyond the silt fencing during construction; • All sediment and erosion control measures would be inspected at least weekly and during and immediately following rainfall events to ensure that they are functioning properly and are maintained and/or upgraded as required; • Topsoil stockpiles would be sufficiently distant from watercourses to preclude sediment inputs due to erosion of stored soil materials; • If the sediment and erosion control measures are not functioning properly, no further work would occur until the sediment and/or erosion problem is addressed; • All disturbed areas of the construction site would be stabilized immediately and re-vegetated as soon as conditions allow; and, • Sediment and erosion control measures would be left in place until all areas of the construction site have been stabilized, as 	

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		<p>determined by the Construction Contractor.</p> <ul style="list-style-type: none"> • Vegetation removal on the slopes of watercourses would be minimized to the extent possible • As soon as possible following completion of the construction activity, stream banks would be restored to their original grade. Seeding would be completed during favourable climatic conditions. Once sown, seed would be protected with a layer of erosion control matting that would assist in stabilizing the slope and propagation of the seed mixture. In the event that broadcast seeding is not feasible due to seasonal restrictions, hydroseeding would be considered. • If siltation to a watercourse occurs, activities would cease immediately until the situation is rectified. • As per s.13 of the Environmental Protection Act, all spills that could potentially have an adverse environmental effect, are outside the normal course of events, or are in excess of prescribed regulatory levels would be reported to the MOE's Spills Action Centre by the Construction Contractor. • Culverts would be sized according to hydrologic requirements to be determined during the detailed design / permit application stage. Other technical requirements may influence culvert size and materials; • Where fish habitat is present, culverts would be installed such that fish passage is maintained. Where a watercourse provides indirect habitat, the culvert must continue to convey flow to downstream areas; • Culverts would be designed and installed such that there is no restriction of flows through the culvert resulting in upstream pooling, no erosion at the culvert inlets and outlets, and no barriers to fish passage to upstream environments. <p>Additional mitigation measures can be found in the <u>Construction Plan Report</u>.</p>	

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
<i>Air Quality and Environmental Noise</i>			
Air Emissions	<ul style="list-style-type: none"> • The engine exhaust from vehicles represents a source of particulate and other emissions. • Traffic delays result in increased emissions from vehicles traveling slowly through construction zones. • The delivery of materials can generate emissions, especially for sites that are relatively far from material manufacturers. 	<ul style="list-style-type: none"> • Multi-passenger vehicles should be utilized to the extent practical. • Company and contractor personnel should avoid idling of vehicles when not necessary for construction activities. • Equipment and vehicles should be turned off when not in use unless required for activities and/or effective operation. • Equipment and vehicles should be maintained in good working order with functioning mufflers and emission control systems as available. • All vehicles should be fitted with catalytic converters as required by applicable regulation. • All construction equipment and vehicles would meet the emissions requirements of the MOE and MTO. • As appropriate, records of vehicle maintenance should be retained and made available for periodic review by the Contractor. • All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or replaced as soon as practicable. 	Limited to the work areas, and the magnitude of combustion emissions are limited. Any adverse net effects are anticipated to be short-term in duration and highly localized.
Dust and Odour Emissions	<ul style="list-style-type: none"> • Potential for nuisance dust effects in the immediate vicinity of the Project. • Winds may erode and disperse loose soil material, which may be a nuisance to residential properties located in close proximity to the construction sites. • Storage piles exposed to wind can be a source of fugitive dust emissions. • No odour emissions are anticipated from the Project. 	<ul style="list-style-type: none"> • The Contractor should implement good site practices which may include: <ul style="list-style-type: none"> – Maintaining equipment in good running condition and in compliance with regulatory requirements; – Protecting stockpiles of soil with a barrier or windscreen in the event of dry conditions and excessive dust; – Dust suppression (e.g. water) of source areas; and; – Covering loads of friable materials during transport. • An Environmental Management Plan would be developed by the Contractor that would include protocols for dust emission control. • GVWF would develop and implement a Communications and Complaint Response Protocol for the construction phase to address any concern from the public such as complaints about 	Any adverse net effects to air quality from dust emissions are anticipated to be short-term in duration and highly localized.

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		dust. • Additional mitigation measures can be found in the <u>Construction Plan Report</u> .	
Environmental Noise	<ul style="list-style-type: none"> • Noise would be generated by the operation of heavy equipment at each of the work areas and associated vehicular traffic on-site and on haul routes. 	<ul style="list-style-type: none"> • All engines associated with construction and decommissioning equipment would be equipped with mufflers and/or silencers in accordance with MOE and/or MTO guidelines and regulations. • Noise levels arising from equipment would also be compliant with sound levels established by the MOE. • To the greatest extent possible, activities that could create excessive noise would adhere to any local noise by-laws and any requirements of the Occupational Health and Safety Act. • Sources of continuous noise, such as portable generator sets, would be shielded as appropriate or located so as to minimize disturbance to local residents. 	Intermittent noise would increase during regular construction hours at the work areas and/or along the haul route. Any adverse net effects due to noise are anticipated to be short-term in duration and intermittent.
Land Use and Socio-Economic Resources			
Areas Protected Under Provincial Plans & Policies	<ul style="list-style-type: none"> • No areas protected under provincial plans and policies are located within 300 m of the Project Location. 	<ul style="list-style-type: none"> • N/A 	N/A
Existing Land Uses	<ul style="list-style-type: none"> • Agricultural lands where Project infrastructure is located would be changed from present land use for the duration of the Project. • There would be a temporary increase in noise and dust levels around the work and haul areas resulting in a potential effects to adjacent land uses. • Noise, air emissions and general disruption during construction/decommissioning periods. 	<ul style="list-style-type: none"> • Landowners would be compensated by GVWF for agricultural land that would be taken out of production during the lifespan of the Project through the land lease agreements. • Mitigation measures related to noise from construction and decommissioning activities are outlined in 'Environmental Noise'. • Mitigation measures related to dust are outlined in 'Dust and Odour Emissions'. • Areas impacted by the construction and operation of the Project would be restored to an acceptable condition to meet municipal zoning by-law requirements at the time and to the satisfaction of the landowner. 	Disturbance would be short-term in duration, temporary, and would be minimized through the implementation of good site practices, transportation planning, and communication with the community.

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
Recreation Areas & Cultural Features	<ul style="list-style-type: none"> No known recreation areas of cultural features are located within 300 m of the Project Location. 	<ul style="list-style-type: none"> N/A 	N/A
Agricultural Lands and Operations	<ul style="list-style-type: none"> Inconvenience to operations, including site-specific cropping patterns. Disturbance to agricultural soils. Adverse effects could occur to artificial drainage. Impacts to livestock. 	<ul style="list-style-type: none"> Siting of turbines and access roads are completed with the approval of the participating landowner. Construction activities would be restricted to the delineated construction areas. Detailed mitigation measures for impacts to agricultural lands and operations are provided in the <u>Construction Plan Report</u>. Key measures include: <ul style="list-style-type: none"> Implementing a wet soil shutdown practice; Monitoring of topsoil stripping; De-compaction of temporary workspaces to occur as required; Topsoil replacement; If Soybean Cyst Nematode (SCN) is identified in agricultural fields, the pre-construction program would include soil analysis for each agricultural row crop field to determine the extent of the SCN infestation; Artificial tile drainage would be repaired and monitored; and, Regular communication with property/livestock owners to ensure a minimum level of impact on livestock. 	Disturbances to agricultural lands and operations are expected to be temporary and spatially limited.
Mineral, Aggregate, and Petroleum Resources	<ul style="list-style-type: none"> Lands designated as tertiary significance for sand and gravel resource extraction are present within 300 m of the Project Location. Project activities are not anticipated to have any potential effects on these resources No known petroleum wells or oil 	<ul style="list-style-type: none"> N/A 	N/A

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	and gas transmission pipelines within 300 m of the Project Location.		
Game and Fishery Resources	<ul style="list-style-type: none"> • Sensory disturbance to game species may occur due to noise from construction and decommissioning activities and increased traffic and human activity. 	<ul style="list-style-type: none"> • Mitigation measures related to noise from construction and decommissioning activities are outlined in '<i>Environmental Noise</i>'. 	Construction and decommissioning noise is expected to be temporary and intermittent.
Local Traffic	<ul style="list-style-type: none"> • The increase in traffic, including excess load traffic, may result in short-term, localized disturbance to traffic patterns, increase in traffic volume, and create potential traffic safety hazards. 	<ul style="list-style-type: none"> • High traffic volume periods would be considered to reduce potential delays. • The Contractor would implement a Traffic Management Plan. • Detailed plans or agreements regarding maintenance and/or repairs of local roads damaged during construction would be developed to the satisfaction of the municipalities, acting reasonably. • The municipalities may identify the need for pre and post construction road surveys, which GVWF would conduct as necessary. 	Effects of construction on traffic are anticipated to be limited and short term.
Local Economy	<ul style="list-style-type: none"> • Direct employment during construction. • Indirect and induced employment. • Potential disruption to use and enjoyment of businesses may occur. 	<ul style="list-style-type: none"> • To the extent possible GVWF and/or the Construction Contractor would source required goods and services from local qualified suppliers where these items are available in sufficient quality, quantity and at competitive prices. • The Construction Contractor would implement a Traffic Management Plan. • Disruptions in the vicinity of local businesses would be largely due to an increase in traffic, and would be short term and are not expected to affect use of these businesses. • Mitigation measures related to reducing the impact of construction activities on agricultural lands and operations are outlined in '<i>Agricultural Lands and Operations</i>'. 	<p>A positive net effect is anticipated on the local economy.</p> <p>Traffic effects will be temporary, of short duration, and cease upon completion of the construction of the Project.</p>

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
Existing Infrastructure			
Provincial and Other infrastructure	<ul style="list-style-type: none"> • The increase in traffic, including excess load traffic, may result in short-term, localized disturbance to traffic patterns, increase in traffic volume, create potential traffic safety hazards, and/or produce abnormal wear on the roads. • There is the potential to interfere with local utilities. • Permits from the MTO may be required to facilitate the component transportation on provincial highways. 	<ul style="list-style-type: none"> • GVWF would consult with the owners of any potentially impacted major infrastructure, and would continue discussions with the Town of Grand Valley and the Township of Amaranth regarding any potential effects to municipal interests. • GVWF would also continue to consult with local utility providers, to ensure the location of all utilities is known and no potential effects would occur. • The Construction Contractor would implement a Traffic Management Plan. • Required permits and agreements will be obtained in consultation with the municipalities and MTO. • Pre and post construction road surveys are expected to form part of these plans or agreements. 	<p>Potential for accidents along the haul routes and on-site cannot be totally avoided.</p> <p>Abnormal wear on municipal roads during construction may be unavoidable.</p> <p>Net effects are anticipated to be limited and short-term.</p>
Navigable Waters	<ul style="list-style-type: none"> • The Project collector line would require crossing the Grand River, which is a navigable watercourse. • As the collector line would be installed by directional drill, no impacts would occur to navigation. 	<ul style="list-style-type: none"> • N/A 	N/A
Waste Management and Contaminated Lands			
Landfill Sites	<ul style="list-style-type: none"> • No known landfill sites are located within 300 m of the Project Location. 	<ul style="list-style-type: none"> • N/A 	N/A
Contaminated Lands	<ul style="list-style-type: none"> • Given the present and historical land-uses the potential for encountering contaminated material or soils is minimal. 	<ul style="list-style-type: none"> • In the event that previously unknown contaminated soils, such as buried tanks, drums, oil residue or gaseous odour, are uncovered or suspected of being uncovered, activities would cease in that location until the source of the contamination is further investigated. • In such an instance, GVWF would retain expert advice on assessing and developing a soil sampling, handling and 	None

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		<p>remediation plan. All contaminated material would be managed in accordance with the applicable sections of the <i>Environmental Protection Act</i> and Regulation 347.</p>	
Waste Generation	<ul style="list-style-type: none"> • Improper disposal of waste material may result in contamination to soil, groundwater, and/or surface water resources on and off the Project sites. Litter may also become a nuisance to nearby residences if not appropriately contained and allowed to blow off the site. 	<ul style="list-style-type: none"> • The Contractor would implement a site-specific waste collection and disposal management plan, which may include site practices such as: <ul style="list-style-type: none"> – systematic collection and separation of waste materials; – all waste materials and recycling would be transported off-site by private waste material collection contractors licensed with a Certificate of Approval – Waste Management System; – contractors would be required to remove their excess materials from the site; – excess materials generated during the course of construction excavations of soil would be handled in accordance with the MOE's Protocol for the Management of Excess Materials in Road Construction and Maintenance; – excess excavated soils may be reused elsewhere on the property with landowner permission; – labelling and proper storage of hazardous and liquid wastes (e.g. used oil, drained hydraulic fluid, and used solvents) in a secure area that would ensure containment of the material in the event of a spill; – dumping or burying wastes within the Project sites would be prohibited; – should contaminated soil be encountered during the course of excavations the contaminated material would be disposed of in accordance with the current appropriate provincial legislation, such as Ontario Regulation 347, the General – Waste Management Regulation; – disposal of non-hazardous waste at a registered waste disposal site(s); – if waste is classified as waste other than solid non-hazardous, a Generator Registration Number is required 	<p>Minor incremental effect on soil, groundwater, and surface water at the waste disposal site(s) depending on municipal on-site containment practices and quality of the landfill protection mechanisms.</p>

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		<p>from the MOE and the generator would have obligations regarding manifesting of waste. Compliance with Schedule 4 of Regulation 347 is mandatory when determining waste category;</p> <ul style="list-style-type: none"> – implementation of an on-going waste management program consisting of reduction, reuse, and recycling of materials; and – disposal of sanitary wastes would be the responsibility of the contracted third party and they would ensure disposal in accordance with appropriate legislation, standards and policies. – the cement provider would be responsible for ensuring that wash water from the cleaning of cement truck drums is disposed of in a sewage works designed for that purpose and approved under Section 53.(1) of the Ontario Water Resources Act, or under Part 8 of the Building Code Act. <ul style="list-style-type: none"> • Construction Waste Management Plans would be developed by the Construction Contractor. 	
Accidental Spills	<ul style="list-style-type: none"> • Some materials, such as fuel, lubricating oils and other fluids, have the potential for discharge to the on-site environment through accidental spills. 	<ul style="list-style-type: none"> • The Emergency Response Plan developed by the Contractor would include protocols for the proper handling of material spills and associated procedures in the event of a spill. Key measures include: <ul style="list-style-type: none"> – standard containment facilities and emergency response materials would be maintained on-site as required; and – refuelling, equipment maintenance, and other potentially contaminating activities would occur in designated areas. • As appropriate spills would be reported immediately to the MOE Spills Action Centre. 	None
Public Health and Safety			
Public Health and Safety	<ul style="list-style-type: none"> • Potential effects to public health and safety are largely in the form of increased traffic, dust emissions, construction noise 	<ul style="list-style-type: none"> • A detailed Traffic Management Plan, Emergency Response and Plan and Health and Safety Plan would be prepared and implemented by the Contractor. • Mitigation measures related to dust emissions is provided in 	There is minimal increased or new risk to public health and safety from construction and/or decommissioning of

Appendix B1: Summary of Potential Environmental Effects and Mitigation Strategy for Construction and Decommissioning of the Project

PROJECT PHASE: CONSTRUCTION & DECOMMISSIONING

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	and unauthorized access of the public to the work sites.	'Dust and Odour Emissions'. <ul style="list-style-type: none"> • Mitigation measures related to noise from construction and decommissioning activities are provided in 'Environmental Noise'. • Access to the construction-site would be controlled through signage and restricted to authorized personnel only. • The Construction Contractor would also employ good site safety practices during the construction phase. • Discussions would be undertaken with local emergency services personnel to familiarize them with the new facilities. 	the Project.

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
<i>Heritage and Archaeological Resources</i>			
Heritage Resources	<ul style="list-style-type: none"> • If heavy machinery or turbine components are required for maintenance activities, the use of roads through cultural heritage landscapes in the communities of Grand Valley, Monticello and Colbeck could impact cultural heritage resources should an accident occur. 	<ul style="list-style-type: none"> • Avoid travel through cultural heritage landscapes in the communities of Grand Valley, Monticello and Colbeck to the greatest extent practicable when transporting heavy machinery and turbine components. 	<ul style="list-style-type: none"> • None
Archaeological Resources	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
<i>Natural Heritage Resources</i>			
Wetlands	<ul style="list-style-type: none"> • Contamination through accidental spills. • Disturbance due to increased traffic, noise or dust during operations and maintenance. 	<ul style="list-style-type: none"> • If required, dust suppression on access roads during operation of the Project could be considered. • Storage of fuel and activities with the potential to cause contamination will occur in properly protected and sealed areas. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately. • Mitigation measures related to accidental spills are outlined in 'Accidental Spills'. • Mitigation measures related to dust emissions are outlined in 'Dust and Odour Emissions'. • Mitigation measures related to noise emissions are outlined in 'Environmental Noise'. • Further wetland mitigation measures can be found in the NHA/EIS. 	<ul style="list-style-type: none"> • The setback of more than 50 m of turbine bases from wetlands will ensure that there is no disruption of wetland function and no net loss of wetland area. • None.
Areas of Natural and Scientific Interest	<ul style="list-style-type: none"> • Contamination through accidental spills. • Disturbance due to increased traffic, noise or dust during 	<ul style="list-style-type: none"> • Mitigation measures related to wetlands are outlined in 'Wetlands'. 	None.

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	operations and maintenance.		
Valleylands and Hazard Lands	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • N/A 	N/A
Significant Woodlands	<ul style="list-style-type: none"> • Contamination through accidental spills. • Dust emissions during operations and maintenance. 	<ul style="list-style-type: none"> • If required, dust suppression on access roads during operation of the Project could be considered. • Storage of fuel and activities with the potential to cause contamination will occur in properly protected and sealed areas. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately. • Mitigation measures related to accidental spills are outlined in '<i>Accidental Spills</i>'. • Mitigation measures related to dust emissions are outlined in '<i>Dust and Odour Emissions</i>'. • Mitigation measures related to noise are outlined in '<i>Environmental Noise</i>'. • Mitigation measures related to traffic are outlined in '<i>Local Traffic</i>'. 	<ul style="list-style-type: none"> • Any adverse net effects are anticipated to be short-term in duration and spatially limited.
Provincial Parks and Conservation Reserves	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
Significant Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> • Contamination through accidental spills. • Disturbance due to increased traffic, noise or dust during operations and maintenance. • Sensory disturbance to wildlife. 	<ul style="list-style-type: none"> • If required, dust suppression on access roads during operation of the Project could be considered. • Should major maintenance activities be required, mitigation measures as outlined in the <u>Construction Plan Report</u> should be implemented. • Storage of fuel and activities with the potential to cause contamination will occur in properly protected and sealed areas. • In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately. 	<ul style="list-style-type: none"> • None

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
Vegetation	<ul style="list-style-type: none"> • Disturbance to flora and vegetation from dust emissions. • Potential for accidental spills. 	<ul style="list-style-type: none"> • If required, dust suppression on access roads during operation of the Project could be considered. • Storage of fuel and activities with the potential to cause contamination will occur in properly protected and sealed areas. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately. 	<ul style="list-style-type: none"> • Effects are anticipated to be short-term in duration and spatially limited.
Birds	<ul style="list-style-type: none"> • Direct mortality. 	<ul style="list-style-type: none"> • Mortality thresholds. 	<ul style="list-style-type: none"> • May be limited mortality.
Bats	<ul style="list-style-type: none"> • Direct mortality. 	<ul style="list-style-type: none"> • Mortality thresholds. 	<ul style="list-style-type: none"> • May be limited mortality.
<i>Water Bodies and Aquatic Resources</i>			
Groundwater	<ul style="list-style-type: none"> • Potential contamination from accidental spills. 	<ul style="list-style-type: none"> • Mitigation measures related to accidental spills are outlined in '<i>Accidental Spills</i>'. 	<ul style="list-style-type: none"> • Accidental spills would be spatially limited and of short duration and protocols to minimize their impact would be provided in the Emergency Response Plan.
Surface Water, Fish and Fish Habitat	<ul style="list-style-type: none"> • Potential contamination from accidental spills. • Erosion and sedimentation 	<ul style="list-style-type: none"> • Silt fencing and/or barriers would be used along all maintenance areas adjacent to water bodies. • No equipment would be permitted to enter any water bodies beyond the silt fencing. • All sediment and erosion control measures would be inspected at least weekly and during and immediately following rainfall events to ensure that they are functioning properly and are maintained and/or upgraded as required. • Topsoil stockpiles would be sufficiently distant from watercourses to preclude sediment inputs due to erosion of stored soil materials. • If the sediment and erosion control measures are not functioning properly, no further work would occur until the sediment and/or erosion problem is addressed. • All disturbed areas of the maintenance site would be 	<ul style="list-style-type: none"> • Any associated effects would be infrequent, of low probability, of short duration and of limited spatial extent.

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		stabilized immediately and re-vegetated as soon as conditions allow. • Sediment and erosion control measures would be left in place until all areas of the maintenance site has been stabilized. • If any damage were to occur, as soon as possible following completion of the maintenance activity, stream banks would be restored to their original grade. • Mitigation measures related to accidental spills are outlined under ' <i>Accidental Spills</i> '.	
<i>Air Quality and Environmental Noise</i>			
Air Emissions	<ul style="list-style-type: none"> • Emissions from operation and maintenance activities, including equipment and vehicles. 	<ul style="list-style-type: none"> • Operations staff would operate vehicles in a manner that reduces air emissions to the extent practical, including: <ul style="list-style-type: none"> – Using multi-passenger vehicles as possible – Avoid idling vehicles. • Equipment and vehicles would be maintained in a manner that reduces air emissions, including: <ul style="list-style-type: none"> – Using mufflers and emission control systems as available; – Using catalytic converters as required by applicable regulation; – Meet the emissions requirements of the Ministry of the Environment (MOE) and/or Ministry of Transportation (MTO); – As appropriate, records of vehicle maintenance should be retained and made available for periodic review by the Contractor; and – All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or replaced as soon as practicable. 	<ul style="list-style-type: none"> • Increased emissions would be short-term in duration and highly localized. • The Project would result in a net reduction of air emissions related to electricity generation, offsetting electricity generated by fossil fuel technologies and therefore, reducing air pollutants and greenhouse gas emissions.
Dust and Odour	<ul style="list-style-type: none"> • Dust emissions from operation and maintenance 	<ul style="list-style-type: none"> • Maintaining equipment in good running condition and in 	<ul style="list-style-type: none"> • Increased dust would be short-term in

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
Emissions	vehicles.	compliance with regulatory requirements. • Dust suppression (e.g. water) of source areas as necessary. • Covering loads of friable materials during transport.	duration and highly localized.
Environmental Noise	• Noise emitted from a turbine and/or transformer. • Noise emitted from equipment.	• Adherence to all noise setback requirements. • All engines associated with maintenance equipment would be equipped with mufflers and/or silencers in accordance with MOE and/or MTO guidelines and regulations. • Noise levels arising from maintenance equipment would also be compliant with sound levels established by the MOE. • Routine facility maintenance to ensure infrastructure is operating properly and efficiently. • To the greatest extent possible, operation activities that could create excessive noise would be restricted to regular business hours and adhere to any local noise by-laws and any requirements of the Occupational Health and Safety Act. • If maintenance activities that cause excessive noise must be carried out outside of these time frames, adjacent residents would be notified in advance and by-law conformity would occur, as required.	• Noise is anticipated to be short-term in duration and intermittent.
Land Use and Socio-Economic Resources			
Areas Protected Under Provincial Plans and Policies	• None	• N/A	• N/A
Existing Land Uses	• Lands which are occupied by facility components would be removed from their present land-use. • Temporary increase in noise and dust levels. • Potential for minor increase of	• Landowners would be compensated by GVWF for agricultural land that would be taken out of production during the lifespan of the Project through the land lease agreements. • Mitigation measures related to noise are outlined in 'Environmental Noise' • Mitigation measures related to dust emissions are	• Disturbance is anticipated to be short-term in duration, temporary, highly localized, and minimized through good site practices, transportation planning and communication with the community.

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	traffic during maintenance activities.	outlined in 'Dust and Odour Emissions'. • Mitigation measures related to traffic are outlined in 'Local Traffic'.	
Recreation Areas and Cultural Features	<ul style="list-style-type: none"> • Temporary increase in noise and dust levels. • Disturbance to the viewscape. • Potential for minor increase in traffic during maintenance activities. 	<ul style="list-style-type: none"> • Mitigation measures related to the viewscape are outlined in 'Viewscape'. • Mitigation measures related to noise are outlined in 'Environmental Noise'. • Mitigation measures related to dust emissions are outlined in 'Dust and Odour Emissions'. • Mitigation measures related to traffic are outlined in 'Local Traffic'. 	Infrastructure would be present during the life of the Project.
Agricultural Lands and Operations	<ul style="list-style-type: none"> • Land taken out of agricultural production. • Inconvenience to operations from traffic and dust. • Minimal impacts to livestock anticipated. 	<ul style="list-style-type: none"> • Landowners are being financially compensated for the lease of the private lands to offset the effect of removing the land from agricultural production. • Activities would be restricted to the delineated Project areas such as access roads and crane pads. • It is recommended that GVWF and/or the O&M Contractor and property/ livestock owners maintain regular communication in order to ensure a minimum level of impact on livestock during operation. 	• Effects to be temporary and spatially limited.
Mineral, Aggregate, and Petroleum Resources	• None	• N/A	• N/A
Game And Fishery Resources	<ul style="list-style-type: none"> • Disturbance to game species from noise. • Improperly installed culverts have potential to affect fish habitat and may impose barriers to fish passage. 	<ul style="list-style-type: none"> • Turbines would be placed in agricultural lands away from woodlands, and within the REA setback requirements. • Culverts would be designed and installed such that there is no restriction of flows through the culvert. 	• None.
Local Traffic	• Increase in traffic may result in short-term, localized disturbance to traffic patterns or increases in traffic	• There may be instances where excess loads (e.g. turbine and transformer components) would require special traffic planning, widening turning radii and road widths and the creation of new ingress/egress nodes.	• Any adverse effects are anticipated to be limited and short-term.

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
	volumes, and/or create potential traffic safety hazards.	<ul style="list-style-type: none"> As appropriate, permits will be acquired. 	
Local Economy	<ul style="list-style-type: none"> Increase in direct, indirect and induced employment over the operations period. Local economic benefits from land lease payments, municipal taxes, etc. 	<ul style="list-style-type: none"> To the extent possible GVWF and/or the O&M Contractor would source required goods and services from qualified local suppliers where these items are available in sufficient quantity and at competitive prices. 	<ul style="list-style-type: none"> Positive.
Viewscape	<ul style="list-style-type: none"> Disruption to the local viewscape from siting of project infrastructure. 	<ul style="list-style-type: none"> Landscaping at the transformer station may include tree and shrub planting where appropriate, while still maintaining site visibility and building security. 	<ul style="list-style-type: none"> Infrastructure would be present during the life of the Project.
Existing Infrastructure			
Provincial, municipal, and other major infrastructure	<ul style="list-style-type: none"> May be instances during maintenance activities where excess loads would require special traffic planning. 	<ul style="list-style-type: none"> Necessary permits would be obtained. As appropriate, for public safety all non-conventional loads would have front and rear escort or “pilot” vehicles accompany the truck movement on public roads. GVWF may notify the community and the municipalities of non-conventional load movements. Consultation with the Municipality and County regarding excess loads with potential to damage roads. 	<ul style="list-style-type: none"> No net effects are anticipated to provincial and local infrastructure during operation of the Project.
Telecommunication or Radar Systems	<ul style="list-style-type: none"> Potential to interfere with telecommunication and radar systems. 	<ul style="list-style-type: none"> In the unlikely event that signal disruption is experienced, mitigation measures may include: <ul style="list-style-type: none"> Replacing the receiving antenna with one that has a better discrimination to the unwanted signals; Relocating either the transmitter or receiver; or Switching to an alternate means of receiving the information (fibre optic or other means). In the unlikely case that a cellular provider demonstrates that its coverage has been diminished to the extent that cellular communications are no longer reliable, coverage can be restored by installation of an additional cell tower or possibly installation of one or more additional 	<ul style="list-style-type: none"> A complaint resolution system would be in place to record and investigate complaints regarding telecommunications interference. No significant adverse net effects are anticipated.

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
Aeronautical Systems	<ul style="list-style-type: none"> • Aeronautical obstruction. 	<p>antennae on the existing cell tower.</p> <ul style="list-style-type: none"> • Turbine lighting must conform to Transport Canada standards. • In order to reduce rural light pollution, lights would be synchronized, with the minimal allowable flash duration, and a narrow beam. • NAV CANADA would update all aeronautical charts with the turbine locations promptly after Project approval. 	<ul style="list-style-type: none"> • None
Waste Management and Contaminated Lands			
Waste Generation	<ul style="list-style-type: none"> • Improper disposal of waste material generated may result in contamination to soil, groundwater, and/or surface water resources on and off the Project sites. • Litter generated may also become a nuisance to nearby residences if not appropriately contained and allowed to blow off the site. 	<ul style="list-style-type: none"> • Contractors would be required to remove all waste materials from the turbine siting areas during maintenance activities. • All waste materials and recycling would be transported off-site by private waste material collection contractors licensed with a Certificate of Approval – Waste Management System. • Labelling and proper storage of liquid wastes (e.g. used oil, drained hydraulic fluid, and used solvents) in a secure area that would ensure containment of the material in the event of a spill. • As per s.13 of the <i>Environmental Protection Act</i>, all spills that could potentially have an adverse environmental effect, are outside the normal course of events, or are in excess of the prescribed regulatory levels would be reported to the MOE's Spills Action Centre; • As appropriate, spill kits (e.g. containing absorbent cloths and disposal containers) would be provided on-site during maintenance activities and at the operation and maintenance building. • Dumping or burying wastes within the Project sites would be prohibited. • Disposal of non-hazardous waste at a registered waste disposal site(s). • If waste is classified as waste other than solid non- 	<ul style="list-style-type: none"> • Minor incremental effect on soil, groundwater, and surface water at the waste disposal site(s) depending on municipal on-site containment practices.

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		hazardous, a Generator Registration Number is required from the MOE and the generator would have obligations regarding manifesting of waste. <ul style="list-style-type: none"> • Implementation of an on-going waste management program consisting of reduction, reuse, and recycling of materials. 	
Accidental Spills	<ul style="list-style-type: none"> • Some materials, such as fuel, lubricating oils and other fluids, have the potential for discharge to the on-site environment through accidental spills. 	<ul style="list-style-type: none"> • Standard containment facilities and emergency response materials would be maintained on-site as required. • Refuelling, equipment maintenance, and other potentially contaminating activities would occur in designated areas. • Spills should be reported immediately to the MOE Spills Action Centre, as appropriate. • An Emergency Response Plan would be developed by GVWF and/or the O&M Contractor and would include protocols for the proper handling of material spills and associated procedures to be undertaken in the event of a spill. 	<ul style="list-style-type: none"> • None
Public Health and Safety			
Turbine Blade and Structural Failure	<ul style="list-style-type: none"> • Collapse of turbine tower, and/or blade detachment. 	<ul style="list-style-type: none"> • Turbines must meet strict international engineering standards. • Proper training and education of staff operating the control system. • Adherence to setbacks from receptors. • Use of lightning protection systems. 	<ul style="list-style-type: none"> • None
Ice fall and Shed	<ul style="list-style-type: none"> • Accumulation of ice on turbine blades. 	<ul style="list-style-type: none"> • Adherence to setback from receptors. • Design of turbine tower reduces ice accumulation. • Automatic turbine shutdown due to weight imbalances. 	<ul style="list-style-type: none"> • None
Extreme Weather Events	<ul style="list-style-type: none"> • Potential damage to project infrastructure from extreme weather events. 	<ul style="list-style-type: none"> • Design, install, operate, and maintain turbines according to applicable industry standards/certifications. • Failsafe devices are capable of shutting down the turbine blades in the event of excessive wind conditions, 	<ul style="list-style-type: none"> • None

Appendix B2 – Summary of Potential Environmental Effects and Mitigation Strategy for Operation of the Project

PROJECT PHASE: OPERATION

Environmental Feature	Potential Adverse Effects	Mitigation Strategy	Net Effects
		imbalance, or malfunction of other turbine components. • Project components have been designed to withstand the effects from extreme events.	
Third Party Damage	• Possibility exists for accidental collision from off-road and maintenance vehicles.	• Access to towers will be restricted to avoid potential accidents to unqualified persons.	• None

Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project

Environmental Feature	Construction	Operation	Decommissioning
Heritage and Archaeological Resources			
Protected Properties and Heritage Resources	<ul style="list-style-type: none"> Monitor vibrations during sub-grade construction activities within 60m of identified cultural heritage resources to ensure that they do not exceed pre-determined limits. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
Archaeological Resources	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
Natural Heritage Resources			
Wetlands	<ul style="list-style-type: none"> Vegetation clearing activities would be conducted under constant observation and monitoring of the Construction Contractor to ensure that vegetation is cleared only from designated areas (within identified 'construction areas'). Areas outside the designated construction-sites would not be disturbed. Monitoring of construction activities is necessary to ensure terrestrial flora and fauna are protected. Reseeded areas would be monitored for one year to ensure regeneration success. Silt barriers would be regularly monitored and properly maintained during and following construction until soils in the construction area are re-stabilized with vegetation. Any sediment bags or filter rings would be monitored during pumping to ensure their efficacy, with any clogging or failures to be rectified immediately. 	<ul style="list-style-type: none"> See 'Accidental Spills' See 'Dust and Odour Emissions' 	<ul style="list-style-type: none"> Follow-up monitoring for one year after site restoration would be conducted, to allow for the Project area to experience seasonal changes and help determine if additional restoration is required, as determined by an environmental advisor. A monitoring plan would be prepared prior to decommissioning.
Areas of Natural and Scientific Interest		<ul style="list-style-type: none"> N/A 	
Valleylands and Hazard Lands		<ul style="list-style-type: none"> N/A 	
Woodlands		<ul style="list-style-type: none"> See 'Accidental Spills' See 'Dust and Odour Emissions' 	
Provincial Parks and Conservation Reserves		<ul style="list-style-type: none"> N/A 	
Other Designated Natural Areas		<ul style="list-style-type: none"> N/A 	
Significant Wildlife and Wildlife Habitat (<i>Significant Wildlife</i>)		<ul style="list-style-type: none"> Post-construction disturbance and mortality monitoring would be conducted to verify effects predictions and additional operational mitigation would be implemented if unanticipated effects occur. Environmental Effects Monitoring Plan submitted as part of the REA application would include: <ul style="list-style-type: none"> Bird mortality monitoring at all wind turbines twice-weekly between May 1 and October 31 for a period of three years following start of operations. A weekly mortality survey will be conducted at all turbines in 	
Significant Wildlife and Wildlife Habitat (<i>Amphibian Breeding and Deer Yards</i>)			
Significant Wildlife and Wildlife Habitat (<i>Area Sensitive Species and Declining Species</i>)			

Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project

Environmental Feature	Construction	Operation	Decommissioning
	<ul style="list-style-type: none"> Regular monitoring of the limits of clearing would be implemented to ensure the objective of minimal disturbance. Should monitoring reveal that clearing occurred beyond defined limits, mitigation action would be taken that could include rehabilitation of the disturbed area to pre-disturbance conditions at the direction of a qualified ecologist (with enhancement of any disturbed areas). 	<p>November to assess raptor mortality.</p> <ul style="list-style-type: none"> Bat mortality monitoring at all turbines twice-weekly between May 1 and September 30 for a three-year period following start of operations in accordance with MNR guidelines. Searcher efficiency trials seasonally and carcass removal trials monthly between May 1 and September 30. Searcher efficiency and carcass removal rates are known to be more variable for bats than for birds throughout the year and depending on habitat (in part due to the relative size of the species). Regular reporting that includes analysis and submission of results to the MNR and Environment Canada (EC). 	
Other Wildlife and Wildlife Habitat		<ul style="list-style-type: none"> See '<i>Local Traffic</i>' See '<i>Environmental Noise</i>' Post-construction disturbance and mortality monitoring would be conducted to verify effects predictions and additional operational mitigation will be implemented if unanticipated effects occur. 	
Significant Flora and Vegetation Communities		<ul style="list-style-type: none"> See '<i>Dust and Odour Emissions</i>' 	
Other Flora and Vegetation Communities		<ul style="list-style-type: none"> Recommendations of up to two years of monitoring of planted restoration or compensation works in order to recommend supplemental works or replacement plantings, if required. 	
Birds		<ul style="list-style-type: none"> See '<i>Other Wildlife and Wildlife Habitat</i>' 	
Bats		<ul style="list-style-type: none"> See '<i>Other Wildlife and Wildlife Habitat</i>' 	

Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project

Environmental Feature	Construction	Operation	Decommissioning
<i>Water Bodies and Aquatic Resources</i>			
Groundwater	<ul style="list-style-type: none"> In the event that wells are encountered during construction, the Construction Contractor may, at the landowner's request, monitor water quality and quantity in these wells over the course of construction to ensure there is no interruption or impact. In the event that well water quality is disturbed as a result of construction, GVWF would provide a temporary potable water supply until corrective measures are taken and would comply with MOE's Guideline B-9: Resolution of Groundwater Interference Problems. 	<ul style="list-style-type: none"> See 'Accidental Spills' 	<ul style="list-style-type: none"> N/A
Surface Water, Fish and Fish Habitat	<ul style="list-style-type: none"> As appropriate, a Construction Contractor representative would be on-site during installation of Project components that could potentially affect aquatic habitats to ensure compliance with specifications, site plans and permits. The Construction Contractor would monitor weather forecasts prior to the installation of Project components, particularly prior to work near aquatic habitats. Environmental monitoring following spring run-off the year after construction (first year of operations) may also be considered to review the effectiveness of the bank and slope re-vegetation (if required), to check bank and slope stability, and to ensure surface drainage has been 	<ul style="list-style-type: none"> If Fisheries Act approvals are required from DFO, some monitoring may be required, and would be stated in the DFO Authorization. Monitoring typically includes photographic records during construction and for two years after the completion of construction to ensure survival of plantings and overall function of the installation. If significant habitat enhancement or compensation measures are required, monitoring may also include assessments of the fish community and habitat use. See 'Accidental Spills' 	<ul style="list-style-type: none"> N/A

Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project

Environmental Feature	Construction	Operation	Decommissioning
	<p>maintained.</p> <ul style="list-style-type: none"> • Appropriate remedial measures will be completed as necessary and additional follow-up monitoring conducted as appropriate, under the direction of an environmental advisor. 		
Air Quality and Environmental Noise			
Air Quality	<ul style="list-style-type: none"> • As appropriate, records of vehicle maintenance would be retained and made available for periodic review by the Construction Contractor. • All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or replaced as soon as practicable from the construction area. 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • As appropriate, records of vehicle maintenance would be retained and made available for periodic review by the Contractor. • All vehicles identified through the monitoring program that fail to meet the minimum emission standards would be repaired immediately or replaced as soon as practicable from the decommissioning area.
Dust and Odour Emissions	<ul style="list-style-type: none"> • The Contractor would monitor to ensure that temporary topsoil storage piles are stabilized with appropriate means. 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • The Contractor would monitor to ensure that temporary topsoil storage piles are stabilized with appropriate means.
Environmental Noise	<ul style="list-style-type: none"> • Monitoring and maintenance of noise abatement devices on construction and support equipment would also take place to keep noise levels within acceptable construction noise standards. • All vehicles identified through the monitoring program that fail to meet the minimum noise standards will be repaired immediately or replaced as soon as practicable from the construction area. 	<ul style="list-style-type: none"> • Noise monitoring (if required), would be conducted in accordance with the REA for the Project. • Turbine shutdown in the event of a malfunctioning turbine or extreme weather event. • Routine turbine maintenance and monitoring to ensure turbines are running properly and efficiently. • Turbines will be monitored electronically twenty-four hours a day, seven-days a week, to allow operational changes to be noted and assessed quickly. • Adherence to Complaint Response 	<ul style="list-style-type: none"> • N/A

Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project

Environmental Feature	Construction	Operation	Decommissioning
		Protocol.	
Land Use and Socio-Economic Resources			
Areas Protected Under Provincial Plans & Policies	• N/A	• N/A	• N/A
Existing Land Uses	• N/A	<ul style="list-style-type: none"> • See 'Environmental Noise'. • See 'Dust and Odour Emissions'. • See 'Local Traffic'. 	• N/A
Recreation Areas & Cultural Features	• N/A	<ul style="list-style-type: none"> • See 'Environmental Noise'. • See 'Viewscape' • See 'Dust and Odour Emissions'. • See 'Local Traffic' • Adherence to Complaint Response Protocol. 	• N/A
Agricultural Lands and Operations	<ul style="list-style-type: none"> • In areas where activity on agricultural land would be for the duration of construction only, the Construction Contractor would monitor topsoil stripping to ensure that the correct depth of topsoil is removed and stockpiled in a manner that avoids mixing with subsoil material. • Where there is potential for damage during construction, the operation of the drains would be monitored during the construction phase, immediately after final clean up, and after the spring thaw the following year. • To ensure the success of measures recommended by the drainage specialist all persistent drainage problem sites would be monitored quarterly for a one year period after repair. 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • For agricultural land, potential soil problem areas including trench subsidence, soil erosion and/or stoniness would be noted. • For the Scotch Pine plantation, if revegetation occurs potential problems including dieback or disease would be noted. <p>Additional monitoring activities may also be conducted, depending upon the site conditions at the time of decommissioning. If negative impacts are noted during monitoring activities, appropriate remediation measures would be implemented as necessary, and additional follow-up monitoring would be conducted, as determined by an environmental advisor.</p>

Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project

Environmental Feature	Construction	Operation	Decommissioning
Mineral, Aggregate, and Petroleum Resources	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
Game And Fishery Resources	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • See 'Environmental Noise' • None required. 	<ul style="list-style-type: none"> • N/A
Local Traffic	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> • N/A
Viewscape	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Adherence to Complaint Response Protocol. 	<ul style="list-style-type: none"> •
Local Economy	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • None required. 	<ul style="list-style-type: none"> • N/A
Existing Infrastructure			
Provincial, Municipal and other major infrastructure	<ul style="list-style-type: none"> • For a period of one year after construction (first year of operations), roads would be monitored following a heavy rain event and following spring runoff, as defined by applicable agreements, to ensure no erosion, bank slumpage, road subsidence or major rutting has occurred as a result of construction activities. As appropriate, affected roadside ditches and drains would be repaired if required and monitored to ensure that they are functioning properly. • If adverse impacts are noted during the above post-construction monitoring, appropriate remediation measures would be developed as per applicable agreements. As appropriate, affected road substrate would be repaired and roadside ditches and drains would be re-vegetated. Additional follow-up monitoring would be conducted, as per applicable agreements, until adverse impacts are no longer 	<ul style="list-style-type: none"> • See 'Local Traffic'. 	<ul style="list-style-type: none"> • Additional monitoring activities may also be conducted, depending upon the site conditions at the time of decommissioning. If negative impacts are noted during monitoring activities, appropriate remediation measures would be implemented as necessary, and additional follow-up monitoring would be conducted, as determined by an environmental advisor.

Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project

Environmental Feature	Construction	Operation	Decommissioning
	evident.		
Navigable Waters	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
Telecommunication and Radar Systems	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Adherence to Complaint Response Protocol. GVWF would review potential incidents of telecommunications interference on a case by case basis. 	<ul style="list-style-type: none"> N/A
Aeronautical Systems	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Routine maintenance of the turbines and replacement of safety lighting in the event of malfunction. 	<ul style="list-style-type: none"> N/A
Waste Management and Contaminated Lands			
Waste Generation	<ul style="list-style-type: none"> As appropriate, records of waste generation and hauling would be maintained. Where a third party's activities are identified as non-compliant or insufficient, the Construction Contractor would seek out an alternative recycling or disposal solution. 	<ul style="list-style-type: none"> See 'Accidental Spills' See 'Emergency Response Plan'. 	<ul style="list-style-type: none"> N/A
Accidental Spills	<ul style="list-style-type: none"> Monitoring would be required following the unlikely event of contamination from an accidental spill or leak. Contaminated soils would be removed and replaced as appropriate. All such activities would follow procedures outlined in the Emergency Response Plan for the CEMP. 	<ul style="list-style-type: none"> Monitoring would be required following the unlikely event of contamination from an accidental spill or leak (method for monitoring may be developed in consultation with the Spills Action Centre of the MOE). Contaminated soils would be removed and replaced as appropriate. See 'Emergency Response Plan' 	<ul style="list-style-type: none"> N/A
Public Health and Safety			
Turbine blade and Structural failure	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Inspections of turbines would occur after extreme events and contingency measures such as turbine shutdown would be implemented in the event of structural damage. Routine turbine maintenance and 	<ul style="list-style-type: none"> N/A

Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project

Environmental Feature	Construction	Operation	Decommissioning
		<p>monitoring to ensure turbines are running properly and efficiently.</p> <ul style="list-style-type: none"> • Turbines will be monitored electronically twenty-four hours a day, seven-days a week, to allow operational changes to be noted and assessed quickly. • See 'Emergency Response Plan'. • See 'Environmental Noise and Public Health and Safety'. 	
Ice fall and shed	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Inspections of turbines would occur after extreme events and contingency measures such as turbine shutdown would be implemented in the event of structural damage and/or icing to a turbine(s). • Routine turbine maintenance and monitoring to ensure turbines are running properly and efficiently. • Turbines will be monitored electronically twenty-four hours a day, seven-days a week, to allow operational changes to be noted and assessed quickly. • See 'Emergency Response Plan' • See 'Environmental Noise and Public Health and Safety'. 	<ul style="list-style-type: none"> • N/A
Extreme Weather Events	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Meteorological sensors in the nacelle would be used to monitor meteorological data. • Turbines will be monitored electronically twenty-four hours a day, seven-days a week, to allow operational changes to be noted and assessed quickly. • See 'Emergency Response Plan' • See 'Environmental Noise and Public Health and Safety' 	<ul style="list-style-type: none"> • N/A

Appendix B3: Summary of Monitoring Plans for Construction, Operation and Decommissioning of the Project

Environmental Feature	Construction	Operation	Decommissioning
Third Party Damage	<ul style="list-style-type: none">• N/A	<ul style="list-style-type: none">• Turbines will be monitored electronically twenty-four hours a day, seven-days a week, to allow operational changes to be noted and assessed quickly.• See 'Emergency Response Plan'• See 'Environmental Noise and Public Health and Safety'	<ul style="list-style-type: none">• N/A

Appendix C

Legal Description of Project Land Parcels

Stantec**GRAND VALLEY WIND FARMS PHASE 3 WIND PROJECT****PROJECT DESCRIPTION REPORT****APPENDIX C - Legal Descriptions of Land Parcels**

April 2013

T101	N1/2 LTS 20 &21, CON 13; S/T EL9127 ELGV PIN 34059 - 0030 (L T)
T102	PT LT 20, CON 13 AS IN MF109521; ELGV PIN 34059 - 0031 (L T)
T103, T104	Lot 23, Concession 12, ELGV County of Dufferin PIN (34060-0124 (LT))
T105	Pts Lot 29 & 30, Concession 9, Pt 1, 7R3989, ELuther/GV (PIN 34062-0048 (LT))
T106	PT Lot 32 Con 9, PT 2 7R4629, ELGV, Planning Act Consent Attached to LTD16853 PIN 34062-0060 (LT)
T107	West 1/2 Lot 20, Concession 10, Except Parts 1 & 2, 7R3420; Amaranth, Subject to execution 97-0140, If enforceable PIN (34049-0041 (LT))
T108	Lot 19, Con 10 Amaranth PIN (34049-0038 (LT))
T109, T110	LOT 28, CON 5 & S 1/2 LOT 28, CON 6, EXCEPT PTS 1&2, 7R3190; ELGV PIN 34066 - 0063 (LT)
T112	W 1/2 LT 26, CON S, EXCEPT PTS 1 & 2, 7R3278; ELGV PIN 34066 - 0033 (LI)
T113	Part Lot 25, Concession 4 as in MF19949; ELGV PIN (34071-0004 (LT))
T114	PT Lot 24, CON 3 as in MF220968; ELGV PIN 34065-0033 (LT)
T115	E 1/2 Lt 24, CON 4 ELGV PIN 34065-0018(LT)
T117, T118	Lot 23, Concession 3, Except MF20155: ELGV PIN (34065-0029 (LT))
T120	Part Lot 32 Con 9 Luthur/ Grand Valley PIN 34062-0064 (LT)
Transformer Station	Part of Lot 30, Concession 8 as in MF219992; subject to MF11067; ELGV (PIN 34063-0028(LT))
Parking and Trailer	PART OF LOT 31, CONCESSION 7, AS IN MF222745 (FIRSTLY); EAST LUTHER/GRAND VALLEY (PIN 34063-0054(LT)), AND PART OF LOT 31, CONCESSION 7, AS IN MF222745 (SECONDLY)
Parking and Trailer	Con 4 Pt Lot 31 Con 3 Pt Lot 31 Des Incl RP 7R3570 Part 1; Pt Lot 31 Des Incl RP 7R3570 Part 1
Electrical Infrastructure	Part of Lot 30, Concession 8 as in MF214115 ELGV, PIN 34063-0029 (LT)