

Project Description: SUMMARY REPORT



The following is a summary of the Project Description Report for the Grand Valley Wind Farms - Phase 3 Wind Project (the Project). The Project Description Report has been written in accordance with Ontario Regulation 359/09. The purpose of the report is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an understanding of the Project, including any environmental effects that may result from engaging in the Project.



Project Location

The Project would be located on privately-owned land, where landowners have entered into a lease agreement with Grand Valley Wind Farms Inc., and within municipal road allowances in the Town of Grand Valley and Township of Amaranth, Dufferin County, Ontario. The Wind 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. All underground collector lines would be constructed on leased lands and within municipal road right-of-way (ROW), and connect to the existing Hydro One Networks Inc. electrical distribution system via a transformer substation. A map showing the Study Area is provided at the end of this document.

Project Components

The basic components of the Project includes between 14 and 17 turbines with a maximum capacity of 40 MW, a 34.5 kV underground power line collector system, fibre optic cabling laid with the underground collector lines, turbine access roads, crane pads, a transformer station, one connection point to the existing electrical system, a meteorological (met) tower, and existing operations and maintenance facilities. Temporary components during construction include work and storage areas at the turbine locations, office, parking and storage areas for the work crews. The electrical power line collector system will transport the electricity generated from the Project to the Hydro One Networks Inc. transmission system.

Project Information

Project Related Setbacks

In order to construct the Project, Grand Valley Wind Farms Inc. must obtain a Renewable Energy Approval (REA) under O. Reg. 359/09. A key component of the REA process is the establishment of common setbacks for all renewable energy facilities in the Province. The Project was designed to meet the mandatory setbacks within O. Reg. 359/09. In some cases, if these setbacks could not be met, an Environmental Impact Study (EIS) was conducted to identify potential negative environmental effects and mitigation measures.

Potential Project Effects

Potential Project effects include:

- Waste generation from construction, maintenance and decommissioning activities;
- Air emissions and dust generation from equipment and vehicles;

- Noise emissions from equipment and vehicles and aerodynamic noise from turbines;
- Hazardous materials, limited to fuels and lubricants for equipment;
- Water-taking activities, depending on groundwater levels; and,
- Potential effects to:
 - Heritage and Archaeological Resources;
 - Natural Heritage Resources;
 - Water Bodies;
 - Land Use and Socio-Economic Resources;
 - Provincial and Local Infrastructure; and,
 - Public Health and Safety.

These potential effects have been assessed in other reports prepared as part of the REA application. Impacts to these features can be mitigated with standard measures during construction, operation and decommissioning.

The Applicant

Veresen Inc. (formerly Fort Chicago Energy Partners L.P.), through its acquisition of Pristine Power Inc., obtained the majority interest in the Project in late 2010. For more information on the Project Applicant, please visit the Project website at <http://www.vereseninc.com/our-businesses/power/wind.html>.

Permits and Approvals

A number of federal, provincial, and municipal permits and approvals are required prior to construction and operation of the Grand Valley Wind Farms – Phase 3 Wind Project. These permits and approvals are applied for outside of the REA process, and Grand Valley Wind Farms Inc. will continue to work with government regulators to obtain these approvals prior to start of construction.

Project Schedule

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 MOE	Spring 2013
REA Decision	Late 2013 (anticipated)
Start of Construction	July - November 2014 (anticipated)
Commercial Operation Date (COD)	Early 2015
Repowering/Decommissioning	Approximately 20.5 years after COD

Construction Plan: SUMMARY REPORT



The following is a summary of the Construction Plan Report for the Grand Valley Wind Farms - Phase 3 Wind Project. The Construction Plan Report was prepared in accordance with O. Reg. 359/09, and is one component of the Renewable Energy Approval (REA) application for the Project. The purpose of the report is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an understanding of construction activities relating to the Project, including any environmental effects that may result from engaging in the Project.



Pre-Construction Activities

Prior to construction, a registered Ontario Land Surveyor (or equivalent) will survey and stake the Project location, which includes the footprint of the facility components, plus any temporary work and storage locations.

Wherever possible, the construction area has been reduced or moved on a site-specific basis to avoid natural features and water bodies.

Construction Activities

Construction includes site preparation, component installation and site restoration.

The basic components of the Project include:

- Between 14 and 17 turbines (currently looking at two models - Siemens SWT 2.3-113 and/or SWT 3.0-113);
- A 34.5 kV underground power line collector system;
- Fibre optic cabling laid with the underground collector lines;
- Turbine access roads;
- Crane pads;
- One connection point to the existing Hydro One Networks Inc. (HONI) electrical transmission system;
- Existing operations and maintenance facilities;
- A 34.5-44 kV/230 kV 45 MVA transformer station; and
- Meteorological (met) tower.

Temporary components during construction include:

- Construction facilities;
- Drill pits for directional drilling;
- Delivery truck turnaround areas;
- Staging areas at each turbine location; and,
- Work crew offices, parking and storage areas.

All turbines will be assembled with heavy-lift crawler and mobile cranes over a period of about 12 weeks.

A 34.5 kV/230 kV 45 MVA transformer station will be constructed for connection to the existing distribution system. The transformer station will occupy an area approximately 80 m x 165 m in size on private lands located in the immediate vicinity of the connection point to the HONI electrical transmission system. Underground collector lines would be constructed parallel to the turbine access roads, and along municipal road allowances, to the transformer station.

Materials that will be brought on site include raw materials, construction vehicles and equipment (e.g. cranes, excavators, dump trucks, water trucks, bulldozers, etc.), and other Project components. Wherever possible, local materials will be used, if sufficient quantity and quality is available at competitive prices.

All temporary work locations will be restored to pre-impact conditions at the end of the construction phase.

Potential Construction Effects & Mitigation

Cultural Heritage & Archaeological Resources

Archaeological resources could be disturbed during construction. Potential impacts to cultural heritage resources are related to vibration from construction of access roads and the underground collector line, and accidental damage travelling through cultural heritage landscapes. Potential visual impacts have also been identified for views from McDougall Cemetery.

If archaeological or historical materials or features are found, all work will be suspended and an archaeologist and appropriate Aboriginal groups will be contacted. If human remains are encountered or suspected, all work will stop immediately, and the proper authorities will be notified.

Potential mitigation measures for built heritage resources and cultural heritage landscapes include avoiding construction activities within 60 m of any structures associated with identified cultural heritage resources, avoiding travel through cultural heritage landscapes in the communities of Grand Valley, Monticello and Colbeck to the greatest extent practicable, avoiding damaging or removing trees and roots near identified properties and landscapes, and stopping activities if monitored vibration levels exceed limits.



Natural Heritage Resources

Construction activities can cause dust, sedimentation, erosion, and accidental spills. Increased traffic, on-site human activities, and environmental noise could result in avoidance, displacement, or mortality of species located near construction activities.

During construction, Grand Valley Wind Farms Inc. will obtain all applicable permits and approvals, ensure no construction disturbance goes beyond defined construction areas, and minimize vehicle movement within construction areas and access roads. Where possible, disturbed areas will be rehabilitated, and regular monitoring will occur throughout construction.

Water Bodies & Aquatic Resources

Construction could result in groundwater seepage, vegetation removal, accidental spills, downstream sediment transport, soil erosion, and a short-term

increase in surface water turbidity (cloudiness), which may affect fish and fish habitat. Some dewatering may also be required.

In-water activities will not occur during spawning season, and Grand Valley Wind Farms Inc. will work with the Ministry of Natural Resources and the Grand River Conservation Authority to determine the best timing windows for in-water work. Silt fencing will be used where required, and vegetation removal along watercourses will be minimized. Where applicable, DFO Operational Statements would be followed to protect fish and fish habitat. Stream banks will be restored following construction, and reseeded. An Emergency Response and Communications Plan will be developed, including procedures in case of accidental spills.

Air Quality & Environmental Noise

Operation of heavy equipment and construction, transportation, and delivery vehicles will result in



localized air emissions, noise, and dust during construction. High winds may result in erosion and dispersal of loose soil.

To reduce emissions, all equipment and vehicles will be maintained in good working order, with mufflers and/or silencers, and construction crews will use multi-passenger vehicles and reduce idling where possible. Crews will adhere to noise by-laws and restrict construction hours. Water will be used for dust control, and soil piles will be covered. A Construction Traffic Management Plan will be developed to outline management of traffic and delivery of materials.

Land Use & Socio-Economic Resources

The land within the Project Study Area is designated as agricultural land and environmental protection, and those lands with Project components will be changed from present use for the life of the Project. Adjacent land uses could

be impacted by the temporary increase in noise and dust levels during construction. Increases in local traffic could cause abnormal wear on local roads and traffic safety hazards. Construction may also affect soil structure and fertility, reducing soil productivity, and affect artificial drainage. Sensory disturbance to wildlife may occur as a result of increased on-site human activities.

Landowners will be compensated for land taken out of production, and the Project has been sited to minimize disturbance to existing land uses. Mitigation measures include de-compacting soil, consultation with landowners and qualified specialists, and implementing the Traffic Management Plan.

The Project is also expected to have a positive impact on the local economy by the creation of indirect and induced employment.

Waste Management & Contaminated Lands

Waste will be generated during the construction phase. Improper disposal of waste may result in contamination to soil, groundwater and/or surface water. Litter may also become a nuisance to nearby residences and there is the potential for accidental spills of materials such as fuel and lubricating oils.

Mitigation measures include proper labelling and storage of materials, refuelling and equipment maintenance only in designated areas and proper disposal of wastes. A Construction Waste Management Plan will be developed, including protocols for reuse, recycling and/or disposal of solid, hazardous and sanitary waste.

Public Health & Safety

Potential effects are largely in the form of increased construction related traffic, dust emissions, construction noise, and unauthorized access to the work sites.

Implementation of transportation planning and safety measures will help to mitigate potential adverse effects. A Health and Safety Plan and an Emergency Response and Communications Plan will be developed to provide guidance on policies and procedures during the construction phase.

Monitoring

The Construction Contractor will be responsible for implementing construction environmental effects monitoring measures in compliance with applicable municipal, provincial and federal standards and guidelines.

Design & Operations: SUMMARY REPORT



The following is a summary of the Design and Operations Report for the Grand Valley Wind Farms - Phase 3 Wind Project. The Design and Operations Report is one component of the Renewable Energy Approval (REA) application for the Project, and has been prepared in accordance with O. Reg. 359/09. The purpose of the report is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an understanding of the details of the design and operational stage of the proposed Project.



Facility Components

The basic components of the Project include between 14 and 17 turbines with a maximum capacity of 40 MW, a 34.5 kV underground power line collector system, fibre optic cabling laid with the underground collector lines, turbine access roads, crane pads, one connection point to the existing electrical system, existing operations and maintenance facilities, a 34.5 kV/230 kV 45 MVA transformer station and meteorological (met) tower.

Facility Operations Plan

Operation activities include daily monitoring of wind turbines and maintenance activities.

Scheduled maintenance during operation will include the following:

- Visual inspection;
- Inspection of mechanical components;
- Inspection of electrical components; and,
- Greasing and general maintenance.

The maintenance of turbines and inspection of the electrical collector system would be the responsibility of Grand Valley Wind Farms Inc. Through use of a Supervisory Control and Data Acquisition (SCADA) system that is connected to fibre optic cables installed

with the collector lines, the maintenance staff would be able to monitor the performance of all turbines on-line in real time. The SCADA system would identify any potential problems so that pro-active inspection and maintenance can occur. Potentially damaged turbines would be shut down until maintenance staff can perform a site inspection.

Initial visits for planned maintenance are more frequent, slowing to once every six months or more as the Project matures. Maintenance of each wind turbine usually takes five days to complete. Each turbine would have sensors to measure wind speed and direction, to determine when the turbines are operating and to control the pitch of the blades and the orientation of the nacelle.

The Project will be monitored on a 24x7 basis and necessary local operations and maintenance personnel will be put in place. An Operations and Maintenance Plan will be developed to ensure compliance with applicable municipal, provincial and federal requirements. All staff will be trained in proper techniques to ensure protection of the environment and safe operation and maintenance of Project equipment.

Potential Operation & Maintenance Effects

Natural Heritage Features

Potential effects to natural features during operation include disturbance due to increased traffic, noise, and dust, the potential for accidental spills, and direct mortality of birds and bats from collisions with turbines. Sensory disturbance to wildlife may occur during operations as a result of increased on-site human activities.

Protocols to minimize the impact of accidental spills and dust will be developed and implemented. All applicable permits and approvals will be obtained prior to operations, and all conditions contained within permits and approvals will be implemented. Post-construction monitoring for bird and bat mortality will occur. These programs are detailed in the Environmental Effects Monitoring Plan.

Water Bodies & Aquatic Resources

Potential impacts from operations and maintenance activities include accidental spills and soil erosion.

Protocols to minimize any impact of accidental spills will be provided in the Emergency Response Plan. Erosion and sediment control measures would be implemented prior to maintenance activities in proximity to watercourses.



Air Quality & Environmental Noise

Air emissions and nuisance dust effects from equipment and vehicle use will occur during operations and maintenance activities. Mechanical and aerodynamic sound will be emitted from the wind turbines during operation.

To reduce emissions from equipment and vehicles, personnel may use multi-passenger vehicles to the extent possible, avoid idling, make sure equipment and vehicles are in good working order, and repair or replace vehicles that do not meet minimum emission standards. A regular maintenance program will largely mitigate potential effects related to noise from damaged turbines. Noise levels from turbines will be compliant with provincial requirements. A Communication and Emergency Response Plan will be in place to hear any concerns from the community and address them appropriately.

Land Use & Socio-Economic Resources

During operation, there is potential for minor increases in traffic on roadways, minimal impacts to livestock, sensory disturbance to game species, and interference with telecommunication and radar systems. The presence of wind turbines will also alter the visual landscape. Mitigation measures will reduce the majority of Project effects during operations and maintenance.

Local economic benefits will include land lease payments to participating landowners, municipal taxes, and local hiring. To minimize the visual impact of the turbines, they will be painted light grey, and spread over the Project Study Area. Potential mitigation measures for effects to telecommunication and radar systems may include the replacement of the receiving antenna, relocating either the transmitter or receiver, or switching to an alternate means of receiving the information.



Waste Management & Contaminated Lands

Improper disposal of waste material generated during operations may result in contamination to soil, groundwater, and/or surface water resources on and off the Project sites. Litter generated during operations may also become a nuisance to nearby residences.

A site-specific waste collection and disposal management plan will be implemented, which will include good site practices. Refueling, equipment maintenance, and other potentially contaminating activities will occur in designated areas.

Public Health & Safety

The highly unlikely potential exists for damage or detachment of turbine parts during operation, which may result in damage to the landing area from impact. Other potential effects may result from the accumulation of ice on the turbine blades, extreme weather events and third party damage.

Modern wind turbines must meet strict international engineering standards. During high wind events or imbalances of the turbine blades due to ice accumulation, the turbines are designed to cease operation. Turbines are equipped with lightning protection systems and located at least the minimum regulated setback distance from receptors. Access to the towers will be restricted to avoid potential accidents to unqualified persons.



Environmental Effects Monitoring Plan

Environmental monitoring will continue with appropriate follow-up activities during the operation of the Project. Monitoring will provide data on key functions of the natural environment and socio-economic features that may be affected during construction or operation of the Project, and on the effectiveness of mitigation measures implemented as part of the Project.

Emergency Response & Communications Plan

The Emergency Response Plan will include a plan for the proper handling of material spills and associated procedures to be undertaken during a spill event. The plan will also specify containment and clean-up of materials and their storage locations and include general procedures for personnel training.

Ongoing stakeholder communication will occur to receive and respond to community issues on an ongoing basis.

Noise Assessment: SUMMARY REPORT



Stantec



The following is a summary of the Noise Assessment Report for the Grand Valley Wind Farms - Phase 3 Wind Project. The report has been prepared in accordance with O. Reg. 359/09 to meet all requirements related to wind project noise for a Renewable Energy Approval (REA), and the MOE's 2008 Noise Guidelines. The purpose of the report is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an assessment of the potential Project-related noise impacts in the Project Study Area, and to confirm compliance with Provincial requirements for turbine noise levels.

To be conservative, two turbine models were assessed as part of the REA process – the SWT 2.3-113 and the SWT 3.0-113. Noise Assessments have been completed for both turbine models as part of the REA process.

Site Investigation



Description of Receptors

Receptors were identified as participating, non-participating, or vacant lot receptors. Receptors were identified through mapping, discussions with municipalities, aerial photographs, and on-site surveys of the area. Typically, for this area non-participating receptors are residential dwellings of individuals and families not associated with the wind project. Participating receptors are dwellings occupied by landowners who receive financial compensation for the placement of project components on their properties or who sign an option/lease contract. All receptors and vacant lots within 1.5 km of any Grand Valley - Phase 3 turbine have been included in the assessment. All receptors are designated as rural, and noise generated by the turbines must therefore be below 40 dBA at all times.

Methods

Cumulative turbine and transformer station sound levels were estimated at each of the receptors as specified in the 2008 MOE Noise Guidelines. Noise levels were modeled at 1.5 m, 4.5 and 7.5 m heights, accounting for the first, second and third floor of a residence, at wind speeds of 6-10 metres per second.

The calculation of cumulative receptor noise levels from wind turbines takes into consideration the following data:

- Locations, types, and heights of each of the receptors;
- Neighbouring wind turbines;
- Turbine characteristics (including hub-height, and octave band source sound power levels);
- Ambient air temperature;
- Ambient barometric pressure;
- Ambient humidity;
- Source ground factor;
- Middle ground factor; and,
- Receptor ground factor.

Conclusions

The noise impact assessment for the proposed Grand Valley Wind Farms - Phase 3 Wind Project determined that the estimated sound levels at receptors and vacant lot receptors comply with the MOE sound level limits. Sound levels will be below 40 dBA at all receptors and all turbines are more than 550 m from non-participating receptors. Detailed data on sample calculations can be found in the [Noise Assessment Report](#), an Appendix of the [Design and Operations Report](#).

Decommissioning Plan: SUMMARY REPORT



The following is a summary of the Decommissioning Plan Report for the Grand Valley Wind Farms - Phase 3 Wind Project. The Decommissioning Plan Report is one component of the Renewable Energy Approval (REA) Application for the Project. The purpose of the report is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an understanding of the closure plan for the Project at the end of its useful life, and to describe restoration of the Project Location to an acceptable condition for its intended use following Project closure.



Decommissioning During Construction

If Grand Valley Wind Farms Inc. cannot complete construction of the Project, the rights to the Project (and any associated liabilities and obligations) would be sold and the Project would be successfully constructed by the purchasing developer.

If the sale of the Project is delayed, Grand Valley Wind Farms Inc. would be responsible for protecting the environment at the Project site. If the Project is not sold to another developer, Grand Valley Wind Farms Inc. will be responsible for decommissioning.

Decommissioning Procedures

Decommissioning After Ceasing Operation

Project components are expected to be in service for the term of the 20 year Ontario Power Authority (OPA) Feed-In Tariff contract. At that point, Grand Valley Wind Farms Inc. could either seek a new contract from the OPA, or decommission the Project. Decommissioning includes removing Project components and restoring the land to an acceptable condition for its intended use.

During decommissioning and restoration, general environmental protection and mitigation measures, according to regulatory requirements at the time of decommissioning, would be implemented.

A temporary staging area at each turbine location would be used for storage of the turbine components, parking, and the foundation spoil pile. All decommissioning activities will occur within the designated areas and temporary erosion and sedimentation control measures will be implemented based on industry best management practices.

The turbines would be dismantled, in the reverse sequence of steps as during construction, using a crane. All materials would be removed for recycling, reuse, reconditioning, or disposal.

Underground collector lines on optioned properties and in municipal road right-of-way would



likely remain in place, with both ends that come to the surface excavated to approximately 1.0m below grade, in consultation with the landowner or municipality and in accordance with the land lease agreements.

All crane pads and turbine access roads would be returned to their original pre-construction state, unless the landowner wishes to keep them intact. Culverts would be removed if requested by the landowner. Such removal will be done in consultation with the municipality, Grand River Conservation Authority (GRCA) and/or Fisheries and Oceans Canada.

As the operations and maintenance building is currently leased for joint use with the existing Grand Valley Wind Farms Phase 1 and Phase 2 projects, decommissioning of the facility will not be required as a part of the present Project.

The transformer station will be removed for reuse, recycling or disposal. The area would be restored to pre-existing conditions at the end of the decommissioning phase and the operator of the Project will develop a Rehabilitation Plan, designed to restore habitat in areas affected by Project-related equipment.

Any proposed decommissioning works within or near watercourses and/or aquatic habitats will be discussed with the GRCA to determine any site specific mitigation and/or remediation plans.

Site Rehabilitation/ Restoration

The operator of the Project will develop a Rehabilitation Plan, in consultation with appropriate agencies, which is expected to cover agricultural and cultural areas, as well as crane pads, access roads and areas for turbine staging.

Areas that may have compacted due to facility operation or decommissioning would be decompacted. Any agricultural tile drains capped during construction, or damaged during decommissioning, would be repaired. Topsoil taken from the surrounding land would be added to a similar depth as surrounding areas. All areas would be graded to pre-construction conditions and restored appropriately, in consultation with the landowner.

The Project should not result in any long term decommissioning effects. The costs will be the responsibility of the Project owner or the purchaser of the reusable materials.

Managing Excess Materials & Waste

Prior to dismantling and demolition, Grand Valley Wind Farms Inc. or the Project operator would complete a waste audit. All wastes would be managed according to relevant regulations and specifications in effect at that time.

Major pieces of equipment may be recyclable or reusable, resulting in minimal residual waste for disposal.

Monitoring

Follow-up monitoring would take place for one year after site restoration, to allow for seasonal changes and to determine if additional restoration is required. A monitoring plan would be prepared prior to decommissioning.



Health and Safety

The Project's Emergency Response and Communications Plan would be in effect for all phases of the Project, including decommissioning.

As appropriate, the decommissioning firm will develop a staff training program for decommissioning activities, including environmental, health, and safety procedures, and the emergency response plan.

Notification

As part of the Emergency Response and Communication Plan, actions will be taken prior to and during decommissioning to inform the public, Aboriginal groups, Dufferin County, the Town of Grand Valley, and the Township of Amaranth regarding activities occurring at the Project site. Notification of decommissioning will be provided prior to decommissioning works commencing. Notification may be in the form of letters, newspaper notices, updates on the Project or company website, or direct communications.

Wind Turbine Specifications: SUMMARY REPORT



The following is a summary of the Wind Turbine Specifications Report for the Grand Valley Wind Farms - Phase 3 Wind Project (the Project). The Wind Turbine Specification Report has been written in accordance with Ontario Regulation 359/09 for a Class 4 Wind Facility. The purpose of the report is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an overview of the turbine technology to be used for the Project.

The Project consists of between 14 and 17 Siemens wind turbine generators with a maximum installed nameplate capacity of 40 MW. To be conservative, two turbine models were assessed as part of the Renewable Energy Approval (REA) process - the SWT 2.3-113 and the SWT 3.0-113. For the noise assessment, both turbine models were assessed. The technical specifications for both turbine models are shown below.



Basic Wind Turbine Specifications: SWT 2.3-113 - SWT 3.0-113		
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 turbine locations are:

Turbine #	UTM Easting (X)	UTM Northing (Y)
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

Natural Heritage Assessment & Environmental Impact Study: SUMMARY REPORT



The following is a summary of the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS) for the Grand Valley Wind Farms - Phase 3 Wind Project. The Natural Heritage Assessment and Environmental Impact Study was prepared in accordance with O. Reg. 359/09, and is one component of the Renewable Energy Approval (REA) application for the Project. The purpose of the report is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an assessment of potential Project-related negative impacts on natural environment features in the Project Study Area.



A Natural Heritage Assessment is required to determine whether any of the following features exist in and/or within the Zone of Investigation (120 m for turbines, and 50 m for collector lines and transformer station) of the Project Location:

- Wetlands;
- Coastal Wetlands;
- Life Science Areas of Natural and Scientific Interest (ANSIs);
- Earth Science ANSIs (within 50 m);
- Valleylands;
- Woodlands;
- Wildlife habitat; and,
- Provincial parks and conservation reserves.

If there is Project infrastructure within the Zone of Investigation of any significant features, an Environmental Impact Study (EIS) is required that identifies and assesses any negative environmental effects and identifies mitigation measures.

Records Review

Documents reviewed and agencies contacted included Environment Canada, MNR, the Grand River Conservation Authority (GRCA), the Town of Grand Valley, and the Township of Amaranth.



Site Investigation

The Grand Valley Wind Farms - Phase 3 Wind Project is primarily sited within actively farmed agricultural fields and has been sited outside the majority of natural features in the Study Area.

A site investigation was required to confirm the presence and delineate the boundaries of the natural features identified through the records review, and to identify any additional natural features in or within the Zone of Investigation of the Project Location.

Methods & Results

Site investigations were completed with the purpose of confirming the status and boundaries of natural features identified through the Records Review and identify additional features. Field investigations delineated the boundaries of existing natural heritage features in the Zone of Investigation, including wetlands, the Luther Marsh Life Science ANSI, woodlands, and candidate significant wildlife habitat features.

These features were evaluated to determine if they are provincially significant, significant, not provincially significant or not significant. Based on background information and on-site field investigations, further assessment was required for significant wetlands, significant woodlands, significant wildlife habitat, and candidate significant wildlife habitat.



Environmental Impact Study (EIS)

An EIS is required to identify and assess any negative environmental effects and develop mitigation measures for significant features within the 120 m Zone of Investigation of the Project Location.

The Project is sited predominately within actively cultivated agricultural land with minimal natural habitat removal required. Several modifications were made to the site plan design in order to avoid placing the Project in natural features to the extent possible, including relocating turbines and collector lines to avoid the Luther Marsh Provincially Significant Wetland (PSW) and ANSI, unevaluated wetlands, woodlands and candidate significant wildlife habitat, and other natural and naturalized communities.

Significant Wetlands

Two provincially significant wetland and twenty-eight unevaluated wetlands are located within the 120 m Zone of Investigation. Substantial effort was allocated to the design of the final layout to ensure that Project components on private land were sited outside of all identified significant wetland boundaries. Some additional design work is required to locate collector lines in the municipal right-of-way; this work will avoid wetlands to the extent possible.

Indirect impacts from construction activities during construction could involve dust, noise, sedimentation, erosion, increased traffic and the potential for accidental spills. All effects are expected to be short term, temporary and mitigable.



Significant Woodlands

There are twenty-two woodlands within the 120 m Zone of Investigation that were evaluated as significant. Most turbines are sited more than 50 m from significant woodlands, and no direct removal of significant woodlands is required.

Indirect impacts resulting from construction activities may include dust, noise, sedimentation and erosion and the potential for accidental spills. These indirect impacts are expected to be short term and temporary in duration and mitigation is available through the use of standard site control measures.

Significant Wildlife Habitat

The following significant wildlife habitats were identified within the 120 m Zone of Investigation:

- Waterfowl stopover and staging areas (terrestrial);
- Waterfowl stopover and staging areas (aquatic);
- Raptor wintering areas;
- Turtle overwintering area;
- Colonial nesting bird sites – ground (Brewer's Blackbird);
- Waterfowl nesting area;
- Woodland raptor nesting areas;
- Amphibian breeding habitat (woodland);
- Amphibian breeding habitat (wetland);
- Marsh breeding bird habitat;

- Woodland area-sensitive breeding bird habitat; and
- Open country breeding bird habitat.

All habitats have not been evaluated and are treated as significant in this report. They will be evaluated prior to construction.

Twenty-two features contain candidate significant wildlife habitat within the 120 m Zone of Investigation. The majority of Project components occur outside the identified habitat features.

Indirect impacts from construction activities may include disturbance or disruption to wildlife, dust, sedimentation and erosion, and the potential for increased traffic and accidental spills. These effects may be greatest if disturbance occurs during critical life stages such as courtship, breeding and or nesting behaviour. These disturbance impacts will be temporary and short term in duration.

Proposed Mitigation

- No development is permitted within wetland, woodland or significant wildlife habitat boundaries;
- Construction timing will consider peak activity periods for wildlife, such as breeding seasons for birds and amphibians, and will avoid interaction during these periods whenever possible;

- Construction vehicles and personnel will stay within designated construction areas;
- Refueling will occur well away from wetlands and generalized significant wildlife habitat;
- In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately;
- Silt barriers will be erected along feature edges that occur within 30 m of construction work;
- Construction machinery should be checked daily;
- Any wildlife found within the work zone should not be handled prior to contacting the MNR; and
- Fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.

Monitoring

A post-construction monitoring program for birds and bats has been developed in consultation with the MNR, including mortality monitoring and regular reporting at turbines for a period of three years after start of operations. The monitoring program should be reassessed by the MNR and Grand Valley Wind Farms Inc. at the end of each monitoring year.

Water Assessment & Water Body: SUMMARY REPORT



The following is a summary of the Water Assessment and Water Body Report for the Grand Valley Wind Farms - Phase 3 Wind Project (the Project). The Water Assessment and Water Body Report was prepared in accordance with O. Reg. 359/09, and is one component of the Renewable Energy Approval (REA) application for the Project. The purpose of the report is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an assessment of potential Project-related negative impacts on water features in the Project Study Area.



Methods

The Water Assessment included a records review and site investigation to determine the presence and boundaries of water bodies, as defined in O. Reg. 359/09, within the 120 m Zone of Investigation (ZOI) of the Project Location. The "Project Location" refers to any land, structure or air space in, on or over which part of a renewable energy project is proposed. For the purposes of this Project, the Project Location includes the footprint of the facility components, plus any temporary work and storage locations.

Once the Project layout and locations of water bodies were confirmed, a general aquatic habitat assessment was conducted. A combination of background data and results of Stantec's 2012 surveys were used to determine the presence or absence of fish habitat within the 120 m Zone of Investigation.

Existing Conditions & Predicted Impacts



Site Investigation

While on site, the field crews confirmed the presence or absence of potential water bodies within 120 m of the Project Location.

Water Features

The Study Area and Project Location fall within the jurisdiction of the Grand River Conservation Authority. The Project Location is situated south of the Grand River headwaters and immediately east of Luther Marsh. The Upper Grand River Watershed falls within the Project Location.

Within the Project Location, water-courses consist predominately of municipal drains. There are fifteen reaches of thirteen water bodies present within the 120 m Zone of Investigation:

- Galbraith Extension Drainage Works
- Galbraith Drain
- No. 21 Drainage Works
- No.16 Drainage Works
- Grand River

- Palmer Drain
- Bruce Drainage Works
- Gajtani Drainage Works
- No. 7 Drainage Works
- Potter Drain
- Atkinson Drainage Works
- No. 1 Drain
- No. 2 Drainage Works

Permits and Approvals

The federal *Fisheries Act* governs the protection of fish and aquatic habitat, including the harmful alteration, disruption or destruction (HADD) of fish habitat, and the deposition of damaging substances into fisheries waters.

All required permits and approvals will be obtained in consultation with the Grand River Conservation Authority and the Department of Fisheries and Oceans (DFO).

Potential Impacts

Three watercourses will be crossed by access roads, requiring permanent culverts. Installation of the underground collector lines will also cross watercourses. The potential impacts of the Project to watercourses could include short-term increases in turbidity (cloudiness) from runoff, soil erosion, loss of shade, reduced bank stability, reduced allochthonous inputs and water quality and aquatic habitat disturbance during construction. Installation and maintenance of culverts and access roads may cause disturbance to aquatic biota and habitat, permanent enclosure of portions of watercourses, loss of bed material within the length of the culvert and changes to riparian vegetation within road allowance. Potential impacts related to the installation of underground collector lines include erosion and sedimentation, collapse of punch or bore hole under the stream, disturbance to riparian vegetation, and disturbance to bottom and bank substrates.

General Mitigation Measures

General mitigation measures for construction activities near a watercourse in the Zone of Investigation include:

- All in-water work would be



- completed within MNR seasonal timing windows to avoid impacts to spawning species;
- Proper operation and storage of materials and equipment will prevent harmful substances from entering the water; and,
- Sediment and erosion control by silt fencing prior to construction will prevent sedimentation of the water.

Monitoring

A Construction Contractor would be on-site during construction

to ensure compliance with specifications, site plans and permits and prevent impacts to fish and fish habitat. Following construction, the bank, bed, and floodplain will be restored to pre-construction conditions, where possible.

During operations, the site will be restored as necessary, and appropriate actions will be taken if an accidental spill and/or leak occurs.

Archaeological Assessment: SUMMARY REPORT



Stantec



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The following is a summary of the Stage 1 Archaeological Assessment and Stage 2 Archaeological Assessment reports for the Grand Valley Wind Farms - Phase 3 Wind Project (the Project). Archaeological assessments are provided to the Ministry of Tourism, Culture and Sport (MTCS) for review in advance of submission as part of the Renewable Energy Approval application. The purpose of the Archaeological Assessment Reports is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an understanding of the archaeological potential within the Project Study Area, and identify any archaeological features that would require removal prior to construction activities relating to the Project.

Methodology

The Stage 1 Archaeological Assessment was composed of a program of background research and visual assessment to determine the archaeological potential of the Study Area. A Stage 1 Property Inspection was conducted in order to gain first-hand knowledge of the geography, topography and current conditions of the Study Area.

The Stage 2 field assessment was conducted in December 2012 in accordance with the *Ontario Heritage Act* (OHA) and the MTCS's *Standards and Guidelines for Consultant Archaeologists* (2011). At each of the turbine locations, the Stage 2 assessment focused on the work spaces required to accommodate the permanent turbine base, permanent crane pad, permanent access road and temporary turn-around areas. All turbine locations have been surveyed and staked. Archaeological monitors from the Saugeen Ojibway Nation, Six Nations of the Grand River, and the Haudenosaunee Development Institute (on behalf of the Haudenosaunee Confederacy Council) participated in the field programs.

Either pedestrian or test pitting surveys were conducted as appropriate for the field conditions on turbine locations, access roads, collector cables, the transformer station, and all other Project infrastructure. The municipal road right-of-ways where underground cable is proposed were also photo-documented and assessed.

Study Area

The Project falls within the Town of Grand Valley and Township of Amaranth, Dufferin County, Ontario. The 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. All underground collector lines would be constructed on leased lands and within municipal road right-of-way (ROW). The study area is located within the Dundalk Till Plain physiographic region of southern Ontario. This region forms the watershed serving as the headwaters of the Saugeen, Maitland, Grand and Nottawasaga Rivers. The Project Location specifically falls within the Grand River watershed.

Stage 1 Archaeological Assessment



A Stage 1 Archaeological assessment was conducted by Archaeological Services Inc. in 2012. The background study determined that no archaeological sites have been previously registered within 1 km of the Study Area. A review of the geographic and historic context suggested that the Study Area has potential for the identification of Aboriginal and Euro-Canadian archaeological resources. The Stage 1 property inspection was conducted in November 2012, and determined that the majority of the Grand Valley 3 study area exhibits archaeological potential but sections of land do not retain archaeological potential due to permanently low and wet conditions.



The results of the Stage 1 Archaeological Assessment recommended: conducting a Stage 2 Archaeological Assessment where there is archaeological potential; no further archaeological assessment required for the remaining lands that do not retain archaeological potential; and should the proposed work extend beyond the current study area then further Stage 1 assessment must be conducted to determine the archaeological potential of the surrounding lands.



Stage 2 Archaeological Assessment



The Stage 2 Archaeological Assessment was conducted by Stantec Consulting Ltd. in December 2012 and January 2013. Fieldwork consisted of a test survey and/or pedestrian survey of proposed lands.

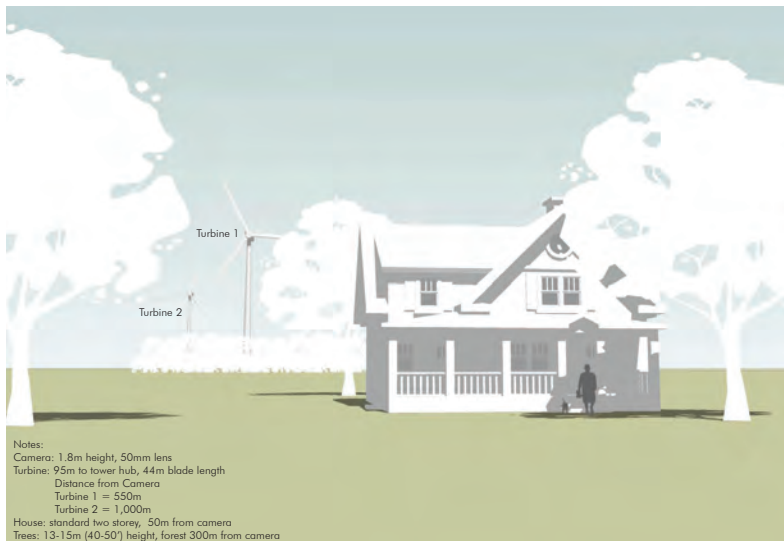
Three archaeological sites were found during the Stage 2 investigations. Two of the sites are historic Euro-Canadian artifact scatters that do not require any further assessment. The third site is a pre-contact Aboriginal findspot. Following Saugeen First Nation archaeological protocol, the site's cultural heritage value or interest still requires further investigation, and the site is being recommended for a Stage 3 Assessment prior to construction.

Stantec advised that should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ontario Ministry of Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

Cultural Heritage Assessment: SUMMARY REPORT



The following is a summary of the Heritage Assessment Report for the Grand Valley Wind Farms - Phase 3 Wind Project. The Heritage Assessment Report is one component of the Renewable Energy Approval (REA) Application for the Project, and has been prepared in accordance with O. Reg. 359/09. The purpose of the report is to provide the public, Aboriginal groups, municipalities, and regulatory agencies with an understanding of any significant cultural heritage resources within the Project Study Area, and, if present, identify any potential impacts to these resources from construction, operation, and decommissioning of the Project.

Methodology

The Heritage Assessment involved archival research, consultation with relevant groups and authorities and a visual survey of the Study Area to identify cultural heritage resources and landscapes which meet the criteria under Ontario Regulation 9/06 for determining Cultural Heritage Value or Interest (CHVI). A visual survey was conducted in November and December, 2012 to document the general cultural landscape of the Study Area, to record the context and condition of previously identified resources, and to determine the existence of any previously unidentified built heritage resources or cultural heritage landscapes within and adjacent to the Project location.

Protected Properties

No protected properties, as described in the table in O.Reg.359/09 Section 19 have been identified within or adjacent to the Project Location.

The Grand River, designated a Canadian Heritage River in 1994, intersects the southeast portion of the Study Area. A collector line will cross the Grand River at the corner of Concession Road 8 & 9 and Sideroad 27 & 28. The collector line will be installed using horizontal directional drilling and, as a result, no negative Project-related impacts on the cultural heritage values of the river have been identified.

Significant Heritage Resources

During the course of the assessment 196 potential cultural heritage resources were recorded. Of those, a total of 28 built heritage resources (BHR) and 37 cultural heritage landscapes (CHL) were identified which meet the criteria under Ontario Regulation 9/06 for determining Cultural Heritage Value or Interest (CHVI).

Impacts & Mitigation

The Ministry of Tourism, Culture and Sport outlines seven potential negative impacts on heritage resources:

- Destruction;
- Alteration;
- Shadows;
- Isolation;
- Direct or indirect obstruction;
- A change in land use; and,
- Land disturbances.

Potential negative impacts were identified for five significant built heritage resources and seven significant cultural heritage landscapes:

- 114408 Sideroad 27/28;
- 073333 Sideroad 24/25;
- Former Erasmus (Wesley) Post Office;
- 322191 Concession 6/7;
- 322191 Concession 8/9;
- 114242 Sideroad 27/28;
- 114520 Sideroad 27/28;
- 0750894 Sideroad 24/25;
- McDougall Cemetery;
- 441158 Concession 12/13;
- 441118 Concession 12/13; and
- 362169 Concession 8/9.



The most common potential negative impact is vibration caused by construction activities. It is recommended that construction activities be avoided within 60 m of identified cultural heritage resources. Where construction within 60 m cannot be avoided, it is recommended that maximum acceptable vibration levels, or peak particle velocity (PPV) levels, should be determined by a qualified engineer prior to any construction activities. Construction within the 60 m should be monitored to ensure that acceptable PPV levels are not exceeded.

Potential visual impacts have been identified for views from McDougall Cemetery. It is recommended that Grand Valley Wind Farms Inc. work with the Town of Grand Valley to determine if a visual barrier such as fencing or tree plantings should be installed to protect the cultural heritage values of the cemetery.

As a general recommendation, roads travelling through cultural heritage landscapes in the communities of Grand Valley, Monticello and Colbeck should be avoided to the greatest extent practicable when transporting heavy machinery and turbine components. Avoiding these roads will minimize the potential for accidental or indirect damage to the high concentration of narrowly setback cultural heritage resources and landscapes within those communities.



Stantec

Project Information



To learn more about the Project or to communicate concerns please contact:

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The following draft Project reports are available for the Grand Valley Wind Farms – Phase 3 Wind Project:

- Project Description Report
- Construction Plan Report
- Design and Operations Report
- Noise Assessment Report
- Decommissioning Plan Report
- Wind Turbine Specifications Report
- Natural Heritage Assessment and Environmental Impact Study
- Heritage Assessment Report
- Water Assessment and Water Body Report
- Archaeological Assessment Reports

Please visit the Project website at: <http://www.vereseninc.com/our-businesses/power/wind.html>

