

The Project reports for Summerhaven Wind Energy Centre are shown below. This summary outlines the Construction Plan Report. The reports presently available for review are:



- Project Description Report
- Construction Plan Report**
- Design and Operations Report
- Decommissioning Plan Report
- Wind Turbine Specifications Report
- Natural Heritage Report
- Water Assessment Report
- Heritage Assessment Report
- Noise Study Report
- Archaeological Assessment Report
- Site Plan Report

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The following is a summary of the Construction Plan outlined in the Summerhaven Wind Energy Centre Construction Plan Report. Construction of the Project will include site preparation, assembling and installing wind turbines, power lines, buildings and roads, which may have some environmental impacts. For more detailed information please refer to the Construction Plan Report.

SITE PREPARATION

To prepare for construction, the boundaries of turbine sites will be staked and any underground pipes or lines will be located and marked. Access roads will be built so that construction equipment and turbine parts can be delivered to the site.

Temporary laydown areas and crane pads will be created beside each turbine site. When equipment is delivered to the site, it will be stored on the laydown areas until the construction and assembly crews are ready to use it.

EQUIPMENT INSTALLATION

Each of the up to 61 wind turbines will need a foundation made of formwork, rebar and concrete. Most of the foundation will be underground, except the tower base. Each foundation will require a large hole measuring 20 metres squared and 3 to 5 metres deep. The turbine tower will then be anchored to the foundation by large bolts set in concrete.

The operations building will be 465 m2 with an adjacent parking lot, and will include washrooms, mess facilities, a storage area and a parking lot. Adjacent to the operations building a transforming substation will be built. The substation will include an isolation switch, circuit breaker, step-up power transformer, transmission switch gear, instrument transformers, and grounding and metering equipment. The electrical collection system will consist of a mixture of underground cable, overhead lines, and junction boxes. Ploughing and trenching will be used to install the underground cables.

POST-INSTALLATION ACTIVITIES

Once construction is finished, clean up and reclamation will occur. All vehicles and equipment will be removed from the area. Excavated soil will be replaced and disturbed areas will be re-seeded. All electrical, mechanical and communications systems will be tested and inspected during this time to ensure the turbines are ready for operation.



POTENTIAL CONSTRUCTION EFFECTS

AIR AND NOISE

Increased traffic and the use of heavy machinery could be a nuisance to humans and animals by creating dust, and noise.

A Dust Management Plan will be implemented, utilizing dust suppressants and wind fences to decrease the amount of dust that is created. Construction equipment will be operated to minimize noise and dust emissions. Nuisance will also be minimized by scheduling construction during regular business hours.

WATER

Some vegetation will be cleared during construction. This may increase storm water run-off. Soil compaction from traffic and heavy machinery could also increase storm water run-off to local streams. To reduce sedimentation, soil and gravel stockpiles will be covered with plastic sheets and silt fencing will be used to protect water courses and wetlands from sedimentation.

Soils will be ploughed and revegetated after construction to reduce compaction. Streams will be monitored during construction by an Environmental Compliance Monitor to check for increased flow rates

SOIL

During construction soil will be excavated and backfilled in a way that ensures the original soil make-up and soil horizons are maintained.

Any soil excavated during construction will be stored in stockpiles. These stockpiles will be covered to prevent erosion and loss of soil. Once construction is complete the soil will be replaced in the reverse order that it was removed and the land will be reclaimed and revegetated with appropriate species.

NATURAL HERITAGE

Most of the Project area is on agricultural land; however, some tree removal and stream crossings are planned. Significant natural features will be avoided wherever possible to make sure that the least amount of disruption to wildlife habitat occurs.

Tree removal could affect animal movement in and around the Project. Fish spawning areas could be affected by access roads that are built across streams. Existing roads will be used wherever possible to minimize the impacts to plants and animals.



ARCHAEOLOGY AND HERITAGE

Buildings with cultural value may be affected by construction dust and vibration. Construction excavations and land clearing could have negative effects on archaeological resources in the Project area. If artifacts or features are discovered in areas where construction is planned, they will be preserved either by changing the Project layout or removing and archiving them.

Archaeological and Heritage Assessment Reports will be submitted to the Ministry of Tourism and Culture for approval before construction begins.

TRANSPORTATION AND WASTE

Transportation of heavy turbine components on local roads may cause minor damage to roads and slow the movement of traffic.

A Traffic Management Plan will be created by the construction contractor with Haldimand County, that will determine which roads are better able to accommodate heavy loads, and to avoid traffic flow disruptions.

Construction waste volumes will be estimated before construction begins, and the capacity of local landfills will be evaluated to determine what quantities and types of materials can be disposed of locally.

ACCIDENTAL SPILLS

Accidental spills of fuel or oil could potentially occur during construction equipment refueling, maintenance or operation, which could contaminate soils. Fueling up in designated areas will reduce the potential for spills. Should a spill occur, construction workers will be trained in spill response and will keep the spill from spreading using spill kits kept at the construction sites.

HEALTH AND SAFETY

All construction workers will be trained to avoid safety hazards related to operating heavy machinery. Excavated trenches will be fenced off to avoid injury.

Warning signs and road closures will be put in place to keep the construction area secure.



DECOMMISSIONING PLAN

REPORT SUMMARY

Fall 2010

The Project reports for Summerhaven Wind Energy Centre are shown below. This summary outlines the Decommissioning Plan Report. The reports presently available for review are:



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The following is a summary of the Decommissioning Plan described in the Summerhaven Wind Energy Centre Decommissioning Plan Report. Decommissioning of the Project will include taking apart and removing wind turbines, power lines, buildings and other Project infrastructure. Roads will be required to access the sites with heavy equipment and cranes used to dismantle the turbine and other components. Once all the infrastructure has been removed, roads will also be removed according to agreements with specific landowners. For more detailed information please refer to the Decommissioning Plan Report.

PROJECT LIFE

The Ontario government has awarded NextEra Energy Canada a Feed-In Tariff contract for the Summerhaven Wind Energy Centre. This contract includes an agreement that the province will buy electricity produced by the Project. The Operations Phase is projected to last for 25 years. After 25 years, the condition of the wind turbines will need to be assessed and depending on their condition and reliability will either have to be refurbished, taken down and resold, or dismantled and disposed of at an acceptable facility.

LAND RECLAMATION

The Project will be located on predominantly agricultural lands that are privately owned. After the wind turbines and other components are removed, the goal will be to restore the land to its prior land-use. Reclamation will take about 6 months and is planned to begin in 2038.

Reclamation will include ploughing compacted soil, re-grading, spreading new topsoil, and re-seeding. On land that is not used for farming, re-vegetation will occur using species acceptable for the end land use. Aboriginal communities could provide advice as to what types of plants they would like to see used.

The meteorological towers built to monitor the weather in the Project Area could be left in place to be used by Haldimand County or local aviation groups if agreed to, or otherwise they will be removed. Wind turbine foundations and cabling below 1m depth will remain after decommissioning, as they are inert and because removing them would result in greater environmental impacts.



PROJECT COMPONENTS

WIND TURBINES

Large cranes will be used to take the wind turbines apart. The turbine pieces will be stored in temporary laydown areas, then trucked off-site to be refurbished, resold or taken to a scrap metal facility.

Part of each turbine foundation will be left underground and then backfilled with soil. The foundations are up to 3 metres below ground and only the top 1 metre will be removed. The holes will be filled to match original soil conditions and to ensure the land can be farmed.

POWER LINES

The Project will include overhead and underground power lines. Overhead power lines and transmission poles that are not shared with Hydro One or Haldimand Hydro will be removed and recycled or reused where possible.

Underground power lines will be dug up at connection points using a backhoe. The cables will be cut at 1m depth and the ends will be buried at every connection point to avoid disturbing large areas of land. The buried lines are inert and are not expected to have any significant negative effects on the soil or the environment.

BUILDINGS AND ROADS

Unless they can be sold, the transforming substation and operations buildings will be taken down and removed. The building foundations will be dug out, crushed and removed. Any gravelled parking areas will also be removed. Substation electrical equipment will be sold or sent to an acceptable waste facility.

Once the trucking is finished the roads will be removed as agreed to with individual landowners. Where roads are to be removed, the top will be stripped, soil will be ripped and clean topsoil will be used to fill these areas.

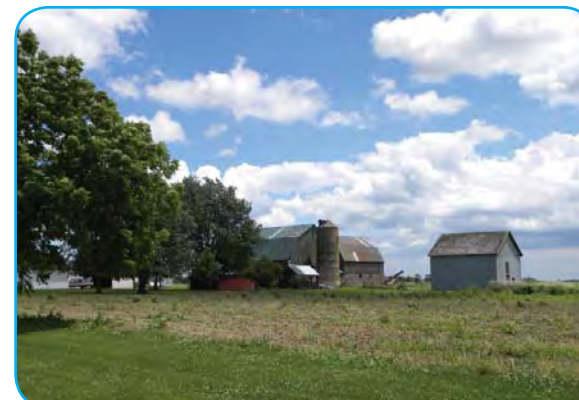
WASTE DISPOSAL

Waste generated by the Project is expected to include:

- Oils, fuels and lubricants
- Transmission poles
- Plastic, concrete, wood and metal building materials

These materials will be reused or recycled wherever possible. Wind turbines that are still in good condition after decommissioning will be carefully disassembled and sold for reuse.

POTENTIAL EFFECTS



WATER

Building and removing the turbines will require the use of heavy machines such as cranes and trucks. When heavy machinery is used, the soil underneath them can be made very hard and dense, or compact. Compacted soil can make it harder for the land to absorb moisture and this can affect drainage. Compacted soil will be ploughed to make it less dense, more absorbant, and suitable for planting.

Increased stormwater run-off can result in negative changes or disruptions to vegetation and species on land and in water. To minimize these effects, exposed soil will be covered with tarps or plastic sheets. A fence that acts as a soil filter, called a "silt fence", will also be built around streams or wetlands to protect them from soil run-off.

SOIL

It is important to make sure that the soil is clean and ready for farming after the project is decommissioned. Soil contamination could occur if oils, fuels and lubricants leak or spill on to the earth. Fueling up in designated areas will reduce the potential for spills. Should a spill occur, construction workers will be trained in spill response and will keep the spill from spreading using spill kits.

Soil on Project lands will be tested for contaminants to make sure that farmers are able to grow healthy crops suitable for human consumption.

AIR QUALITY

Exposed soil can also cause an increase in airborne dust. Dust can be harmful to people, vegetation, and wildlife. Putting plastic sheets on soil piles will reduce dust emissions and avoid the build up of silt in streams or rivers. Water trucks will also be used to control dust during dry periods.



SITE PLAN REPORT SUMMARY

Fall 2010

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The following is a summary of the Site Plan Report for the Summerhaven Wind Energy Centre. The Report provides the Site Plan diagram which shows details of Project infrastructure, land uses, and natural features within the Project Area. It also describes the two substation and transmission line options currently being considered for the Project. For more detailed information please refer to the Site Plan Report.

PROJECT OVERVIEW

The goal of the Summerhaven Wind Energy Centre is to generate electricity from the wind using up to 61 wind turbines. Each turbine is designed to produce 2.221 megawatts (MW) of electricity. The nameplate capacity of the entire Project, or the maximum amount of electricity that the wind turbines can produce, is 135.5 MW.

Other Project components include a substation, which increases the electrical voltage and the transmission line that carries the electricity to the Hydro One corridor and an operations and maintenance building, which will be located beside the substation. Access roads will allow personnel and equipment to access turbines, underground and overhead cables will connect the turbines to each other, and two weather towers will monitor wind speeds for Project operations.

SUBSTATION AND TRANSMISSION LINE OPTIONS

Substation Option 1 is shown on the main map, and Substation Option 2 is shown on the map inset (see map on next page). The two options have different locations for the substation (and operations building), different routes for the transmission line to carry power to the Hydro One corridor, and differences between the number of cables (and how much power they will carry) along these routes.



SUBSTATION OPTION 1

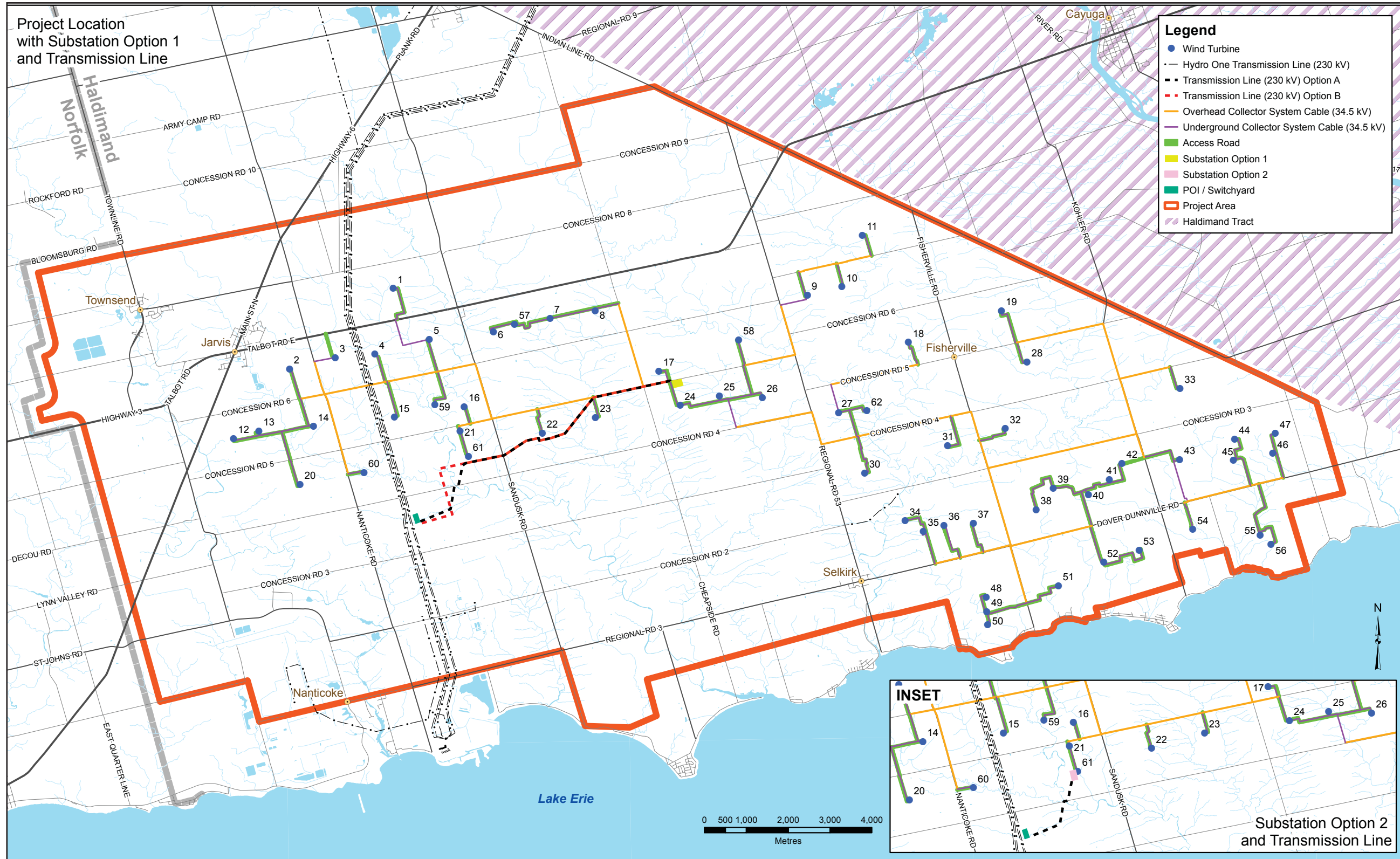
Substation Option 1 has the substation located further to the east, and 230 kV transmission line will carry power from the substation west and southwest to a point where it then has two potential routes to connect to the Hydro One corridor.

SUBSTATION OPTION 2

Substation Option 2 has the substation located further to the west, where the 230 kV transmission line that would be coming from the other proposed substation (Substation Option 1) would instead be several 34.5 kV cables feeding power into this substation. The Substation Option 2, the 230 kV transmission line (option A) would carry power to the south and west to connect to the Hydro One corridor.



SITE PLAN MAP



The Project reports for Summerhaven Wind Energy Centre are shown below. This summary outlines the Stage 1 Archaeological Assessment Report. The reports presently available for review are:



- Project Description Report
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REPORT SUMMARY

A Stage 1 archaeological background study was conducted for the Summerhaven Wind Energy Centre and submitted to the Ministry of Tourism and Culture for review in August 2010. We expect The Ministry to provide a letter accepting the report recommendations, which will be included as part of the Project application. The findings of the Stage 1 background research are summarized in the following pages.

The Stage 1 Archaeological Assessment Report found that there was moderate to high potential for archaeological resources within the Project Study Area, and recommended further studies take place in the form of a Stage 2 Assessment. The Stage 2 assessment is ongoing and the Ministries of the Environment; of Tourism and Culture; and of Energy and Infrastructure have agreed to allow the Stage 2 assessment to be completed after the Project application is submitted.

ARCHAEOLOGICAL POTENTIAL

The following five factors were examined to determine the potential for archaeological resources in the Project Study Area:

- Topography
- Soil texture and drainage
- Distance to water sources
- Ancient beach lines and water sources
- Known sites already in the area

TOPOGRAPHY AND SOIL

The Project Study Area is a level lake plain consisting mostly of silty clay from the Haldimand and Smithville series. The topography and soil types would be suitable for pre-contact Aboriginal agricultural practices.

WATER SOURCES

The Project Study Area is near several water sources. Lake Erie is the largest water body south of the Project Study Area. The Grand River is also a large source of potable water directly to the east of the Project Study Area. There are a number of creeks within the Project Study Area including:

- Nanticoke Creek
- Sandusk Creek
- Stoney Creek
- Hemlock Creek

KNOWN SITES

An archaeological site represents the remains of past human use in an area. This could include a village, an ancient cemetery or something as small as one piece of a stone tool. There are 41 previously known archaeological sites in the Project Study Area. Thirty-two of the sites are pre-contact Aboriginal sites, five are historic Euro-Canadian sites, and four are multi-component, or mixed, sites.



ABORIGINAL

The Stage 1 background research found 32 Pre-contact Aboriginal sites registered in the Project Study Area. The large number of sites attests to the long history of human occupation in Haldimand County.

Outcrops of chert (a stone used for tool-making) along the Lake Erie shoreline provided a useful natural resource that also likely contributed to the presence of Aboriginal people in the area. The existing sites include artifacts from three different time periods, as detailed below.

First Nations monitors and/or field technicians from Six Nations and Mississaugas of New Credit First Nations participated in all field studies.

PALEO-INDIAN

9000 to 8000 B.C.

The Paleo-Indian time period featured caribou hunters using spears. Southern Ontario had an Arctic-like environment during this period, and people lived in small groups and travelled frequently according to the season.

ARCHAIC

8000 to 950 B.C.

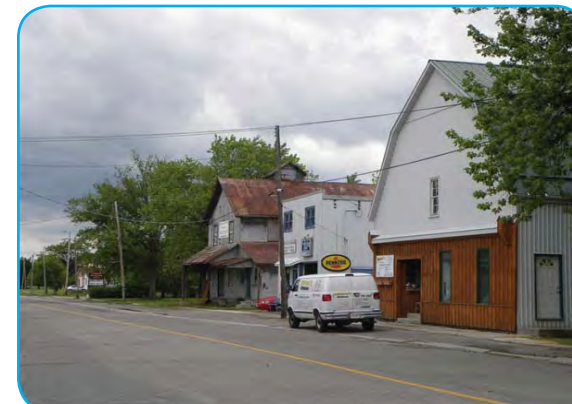
By the Archaic time period, the environment in Southern Ontario had changed to be similar to how it is now. The early Archaic time period was characterized by slow population growth and a lifestyle similar to the Paleo-Indians. But by the late Archaic time period, the population was growing, cemeteries had started being used, and bows had started being used for hunting.

WOODLAND

950 B.C. to 1650 A.D.

The Woodland time period saw the introduction of pottery and corn harvesting, and settlements had started becoming permanent year round. By the end of the woodland time period, there were large villages based on agriculture longhouses, and tribal warfare and displacement between bands.

EURO-CANADIAN



The Project is located in Haldimand County, named after Sir Frederick Haldimand, a British military officer and Governor of Quebec in the 18th century. The land grant extending 6 miles on each side of the Grand River, also named for Haldimand, was given to the Six Nations as thanks for their loyalty to the Crown during the American Revolutionary War. Historically, Haldimand County was divided into 10 townships. The Project Study Area is within the geographic townships of Walpole and Rainham.

WALPOLE TOWNSHIP

Walpole Township was first surveyed in 1780. By 1879, Jarvis was the one principle village of Walpole Township within the Project Study Area. Jarvis was the result of Plank Road (now Highway 6) being built in 1834 to connect Port Dover to Hamilton. Another early road in Walpole Township was the Talbot Road, now known as Highway 3. In addition to houses, Walpole Township included a brickyard, churches, a hotel, and schools within the Project Study Area.

RAINHAM TOWNSHIP

Rainham Township was surveyed in 1829. In addition to houses, schools and churches, Rainham Township featured cemeteries and mills within the Project Study Area. A few of the churches and cemeteries still stand, but many of the 19th century buildings no longer exist. An archaeological assessment would also be needed to determine if there are any remains that would be affected by the Project.

NEXT STEPS

A Stage 2 Archaeological Assessment has begun and is scheduled to be completed by the end of 2010. The goal of this stage is to identify archaeological resources by doing a land survey of areas where potential ground disturbance may occur. As of September 2010, over 600 sites have been recorded, however most of these sites will be avoided during Project construction.

If the Stage 2 surveys discover a site with important archaeological value in the Project Study Area, a Stage 3 assessment will be conducted. Stage 4 work is also possible, and includes developing conservation strategies for archaeological sites. NextEra will continue to work with First Nations monitors and Aboriginal communities to share information and ensure respectful treatment of all artifacts.



19th century ceramics



Late-archaic spear points



HERITAGE ASSESSMENT REPORT SUMMARY

Fall 2010

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The following is a summary of the Heritage Assessment Report that describes the historical context, cultural heritage landscapes and heritage resources in the Project Study Area. For complete information please refer to the Summerhaven Wind Energy Centre Heritage Assessment Report.

HERITAGE ASSESSMENT REPORT

A Heritage Assessment Report was completed based on:

- Historical research
- Consultation with local heritage organizations
- Field surveys

The Report provides a historic background of the Project Study Area and describes its historic resources. The resources are evaluated against the criteria outlined in the Ontario Heritage Act, and potential impacts of the Project on cultural heritage resources are identified.

PHYSICAL SETTING

The Project Study Area is located in Haldimand County, between the Niagara Escarpment and Lake Erie. The County's Official Plan allows for the protection of significant vistas along the shorelines of Lake Erie and the Grand River.

The County has also partnered with local agencies including the Grand River Conservation Authority and the Lower Grand River Land Trust to protect the Grand River as a heritage river.

EARLY SETTLEMENT

Early land surveys were completed in order to grant land to United Empire Loyalists including Treaty Surveys for land grants to Six Nations. These surveys established the road patterns and location of farmsteads, and had profound effects on the cultural heritage landscape of the Project Study Area. Many of the original boundary lines are still visible today as fences and hedgerows.



CULTURAL HERITAGE LANDSCAPES

A cultural heritage landscape tells a story about an area's past. This includes natural landscapes, man-made or altered landscapes or lands that have evolved to have special religious, artistic, cultural, or natural significance.

Cultural landscapes were evaluated by researching the pre-historical and historical pasts to describe the history of human occupation and how the landscapes in the Project Study Area have evolved over time. Two types of cultural heritage landscapes are represented within the Project Study Area. A rural cultural heritage landscape which tells the agricultural history of the region, and the traditional cottage landscape which exists along the Lake Erie shoreline.

HERITAGE RESOURCES

A heritage resource is a building, structure, landscape or specific feature that is determined to have cultural heritage value, or is protected under the Ontario Heritage Act.

Cultural Heritage Value or Interest refers to the cultural meaning of a site. The Ontario Heritage Act sets out specific criteria for determining Cultural Heritage Value. A site may have cultural heritage value because it has artistic value or is a rare or representative example of a particular design style; it may be associated with an important person or event; or a site may be recognized as a landmark or help to define the character of an area.

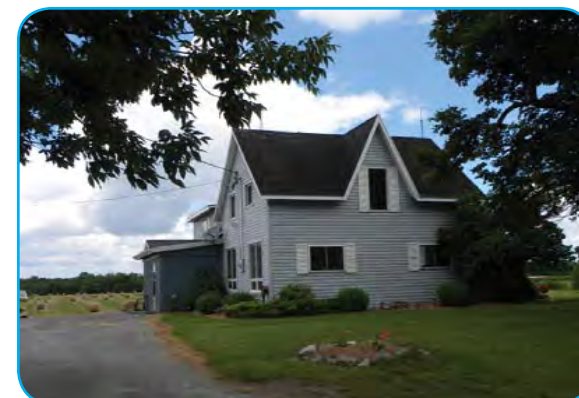
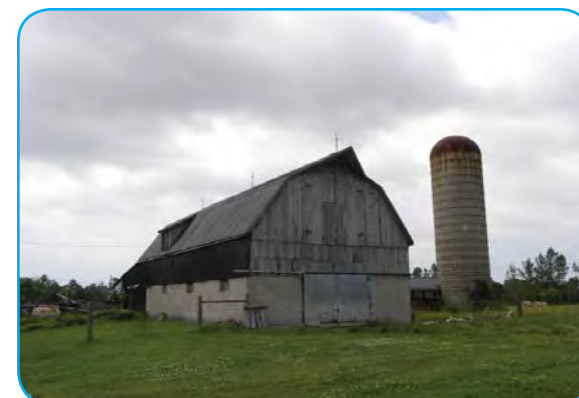
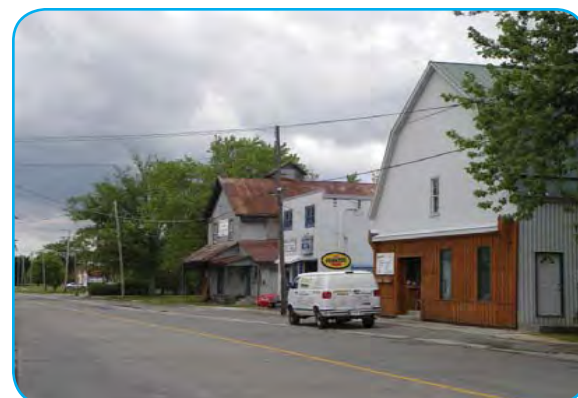
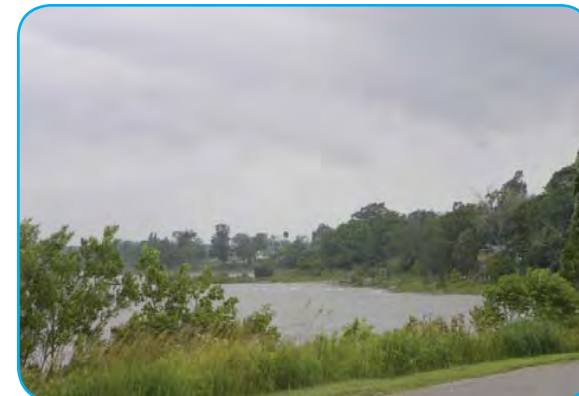
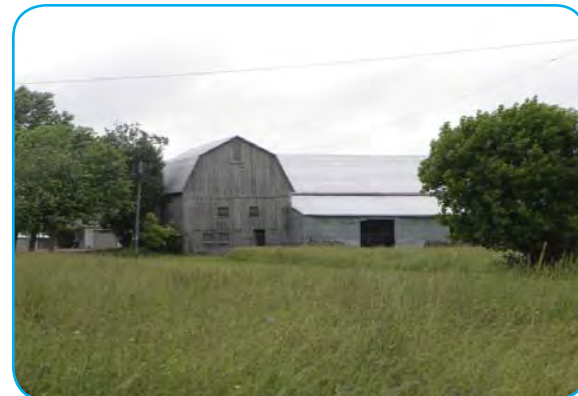
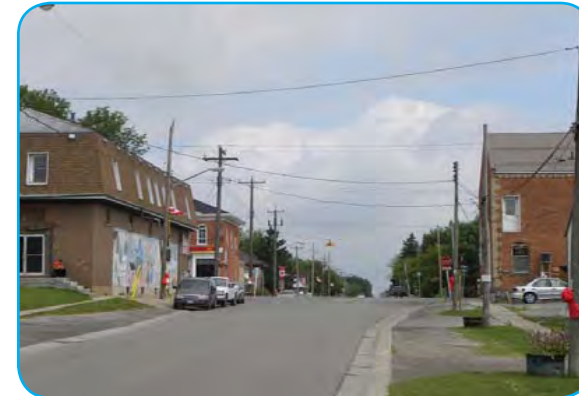
In the Project Study Area, 54 houses and 37 barns were identified to be greater than 40 years old. When evaluated against the Criteria for Determining Cultural Heritage Value or Interest none of these structures was determined to be significant enough to proceed with further investigation. The heritage resources will likely not be impacted by the Project. As a result no strategies for monitoring have been recommended.

PROTECTED SITES

There are four properties located within the Study Area that have been designated under the Ontario Heritage Act, however none of these properties are located at the Project Location.

- Cooper-Fess Residence, 27 Erie Street South, Selkirk
- Charles Reicheld House, 601 Regional Road 12, Fisherville
- Cottonwood Mansion, 740 Regional Road 53, Selkirk
- Hoover Log House, 59 Concession Road 4, Fisherville

The Hoover Log House is located on a property adjacent to the Project Location, however because it was dismantled and moved to this site in the late 20th century, further impact analysis is not required.



AGRICULTURE

Agricultural development in the Project Study Area is divided into four historical phases:

- Pioneer farming from the early 1800s
- Wheat growing for export from about 1840 to the 1860s
- Mixed farming beginning in the 1860s, and
- Agricultural specialization beginning in the 1940s.

Presently, much of the land continues to be used for agricultural purposes, including crops of corn, soybeans and wheat as well as hayfields and pasture.

INDUSTRY

The earliest industries of Haldimand County were saw and grist mills constructed on the nearby rivers and creeks. The earliest mill was constructed in 1802. By 1897 there were 3 mills operating within the Project Study Area. No remnants of these mills were evident during field survey.

Natural gas is an important local industry and was first struck outside of Dunnville, spurring early development around Dunnville, Cayuga and the Grand River. By 1910 the historic townships of Rainham and Walpole were also determined to be rich sources of natural gas. Gas wells were dug throughout the townships, including some that still exist today.

TRANSPORTATION

Old Talbot Road, Plank Road, and Rainham Road, were some of the earliest roads constructed in this region and dictated the layout and survey patterns of the County. Lakeshore Road may have originally been a path travelled by First Nations people. The route was used by the earliest European settlers to the County as they travelled from the Niagara Peninsula.

Two historic railway lines run through the Project Study Area. The Hamilton and Lake Erie was established in 1869 and was used until the 1930s. This line intersected with the Great Western Loop Line, completed in 1870. This railway was eventually taken over by Canadian National Railway and continued to run as a freight line into the 1950s.



NOISE STUDY REPORT SUMMARY

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WHAT IS A NOISE RECEPTOR?

A noise receptor is a location, at which sound emitted from the project (turbines and substations) is received. There are four types of noise receptors defined, which identify if the landowner is participating in the project, and/or if there is an existing building on the lot.

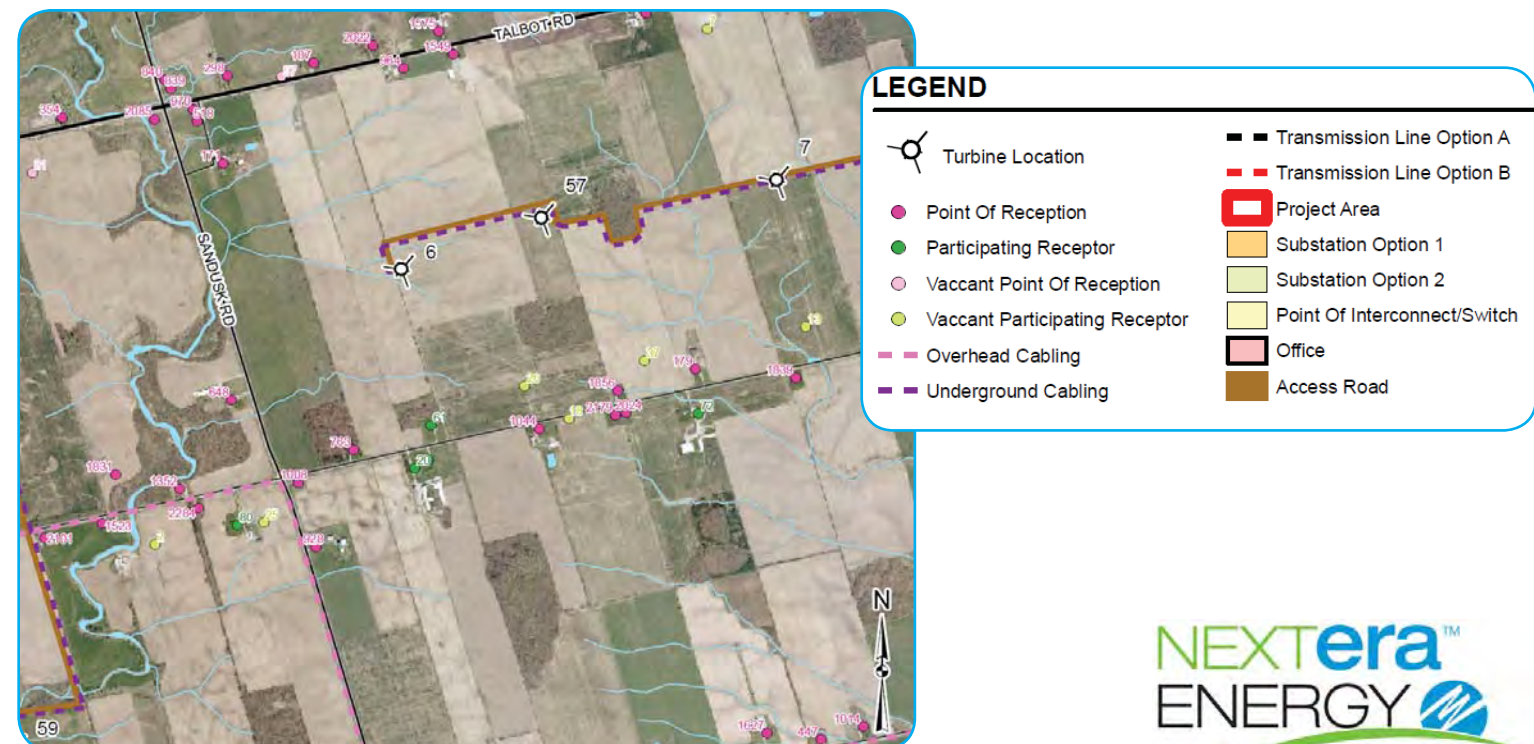
Point of Reception: the centre of buildings or structures used for overnight accommodation or those used as an educational facility, day nursery, or place of worship.

Participating Receptor: an existing building or structure that is participating in the Project, for example a home whose owner has optioned their property for Project use.

Vacant Participating Receptor: a property whose owner is participating in the Project, and does not have a building or structure on it.

Vacant Points of Reception: a property whose owner is not participating in the Project, and does not have a building or structure on it, but could be developed in the future.

The map below shows noise receptors identified for a small portion of the Project Study Area. As shown, each receptor is given a unique number and is colour-coded depending on its type. For a full list of receptors please see the complete Noise Study Report.



NOISE MODELLING

Noise modelling was used to develop a final layout for the Project and ensure that noise levels met Ministry guidelines at all points of reception. The process followed the following four steps.

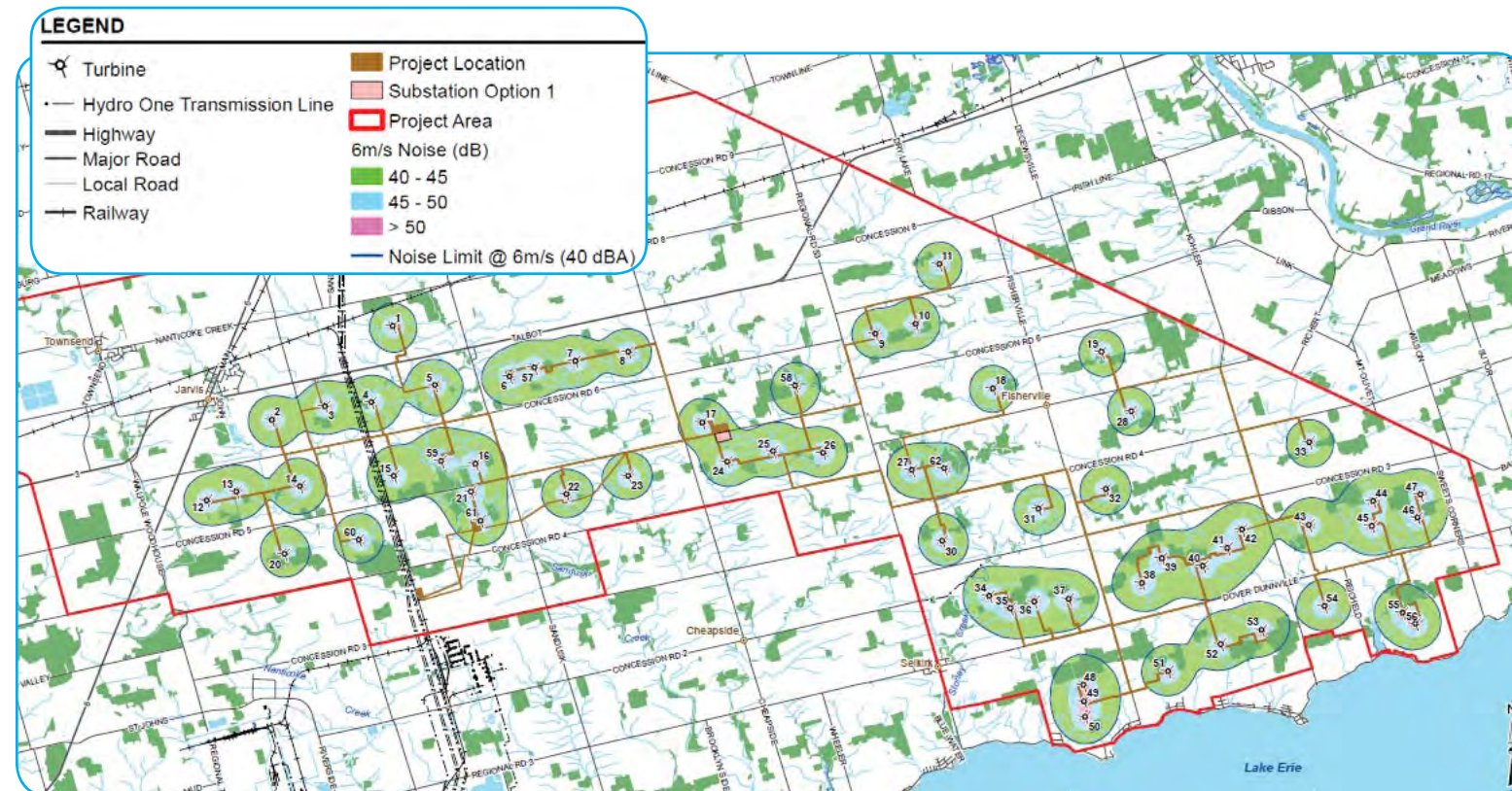
- 1. Identify Receptors:** The first step is to identify receptor locations that can receive sounds emitted from the Project. Receptors were identified using satellite imagery and site visits.
- 2. Determine Project Details:** The second step is to obtain the turbine specifications from the manufacturer. A wind turbine manufacturer warrants a specific noise performance level for their turbine. The sound a turbine makes depends on wind speed and the specific design and model of the wind turbine.
- 3. Model the Noise Levels:** The third step is to add the turbine and substation locations and sound power levels to a model. Overall noise levels from all Project turbines and substations.
- 4. Adjust the Layout:** Turbines locations are often moved around several times during modelling to minimize noise levels at identified receptors. The final layout cannot be decided until we can ensure that, in addition to other Project constraints, noise guidelines are met.

RESULTS

Satellite imagery and site visits confirmed the following receptors within the Project Study Area:

- 2,365 Points of Reception
- 90 Participating Receptors
- 48 Vacant Participating Receptors
- 125 Vacant Points of Reception

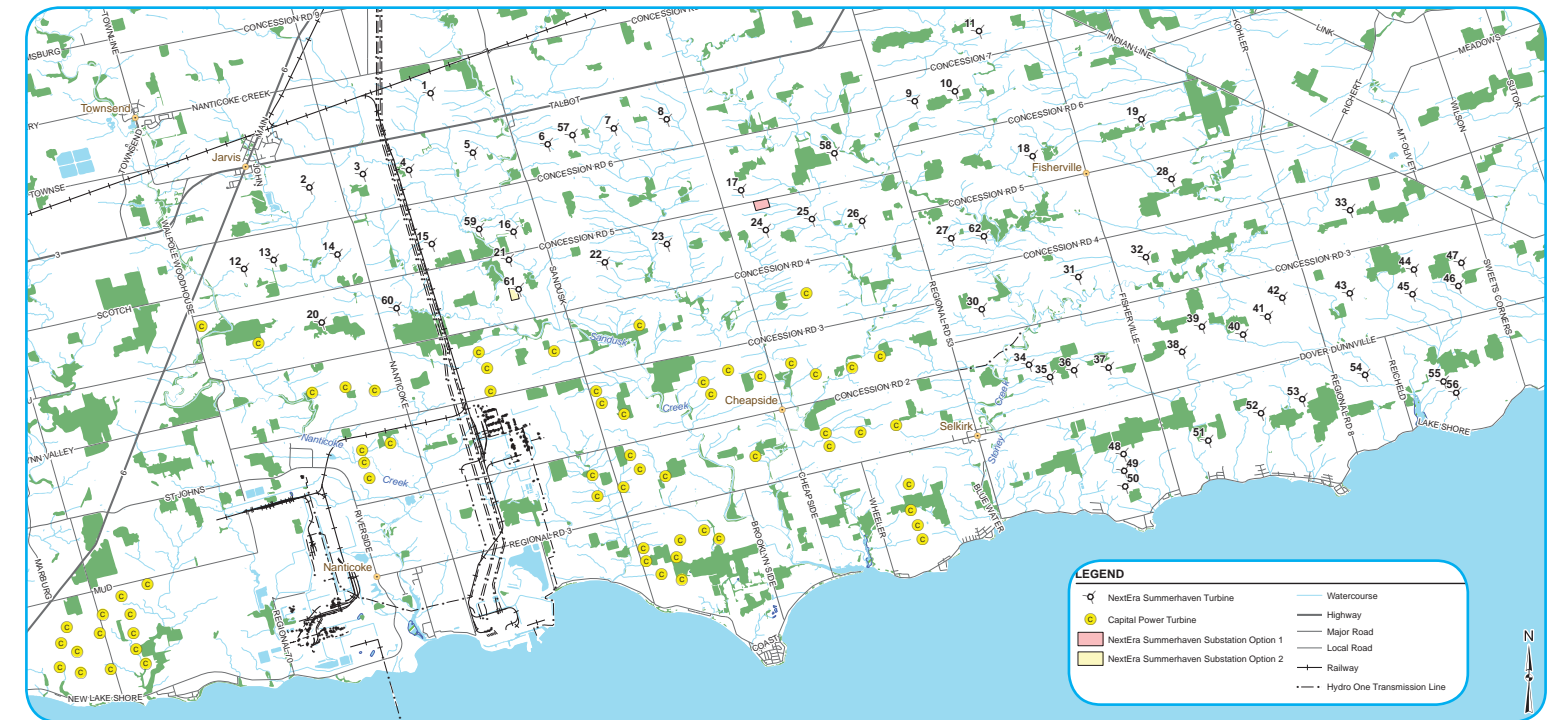
The map below shows an example of noise contours resulting from turbine and substation operations. This map is the end result of modelling and shows that Ministry guidelines are met.



CUMULATIVE IMPACTS

All other planned wind projects within a 10 km buffer of the Project Study Area must be considered in the Noise Study Report. One project was identified within the buffer. The Capital Power Corporation Port Dover and Nanticoke Wind Project is planned to include 62 Vestas turbines and have a nameplate capacity of up to 111.6 MW.

Capital Power and NextEra Energy compared site layouts, including turbine and substation locations so that additional noise modelling could be completed. Cumulative noise modelling was conducted, which included both planned projects operating at the same time. The results of the modelling showed that noise guidelines can be met with both projects operating.



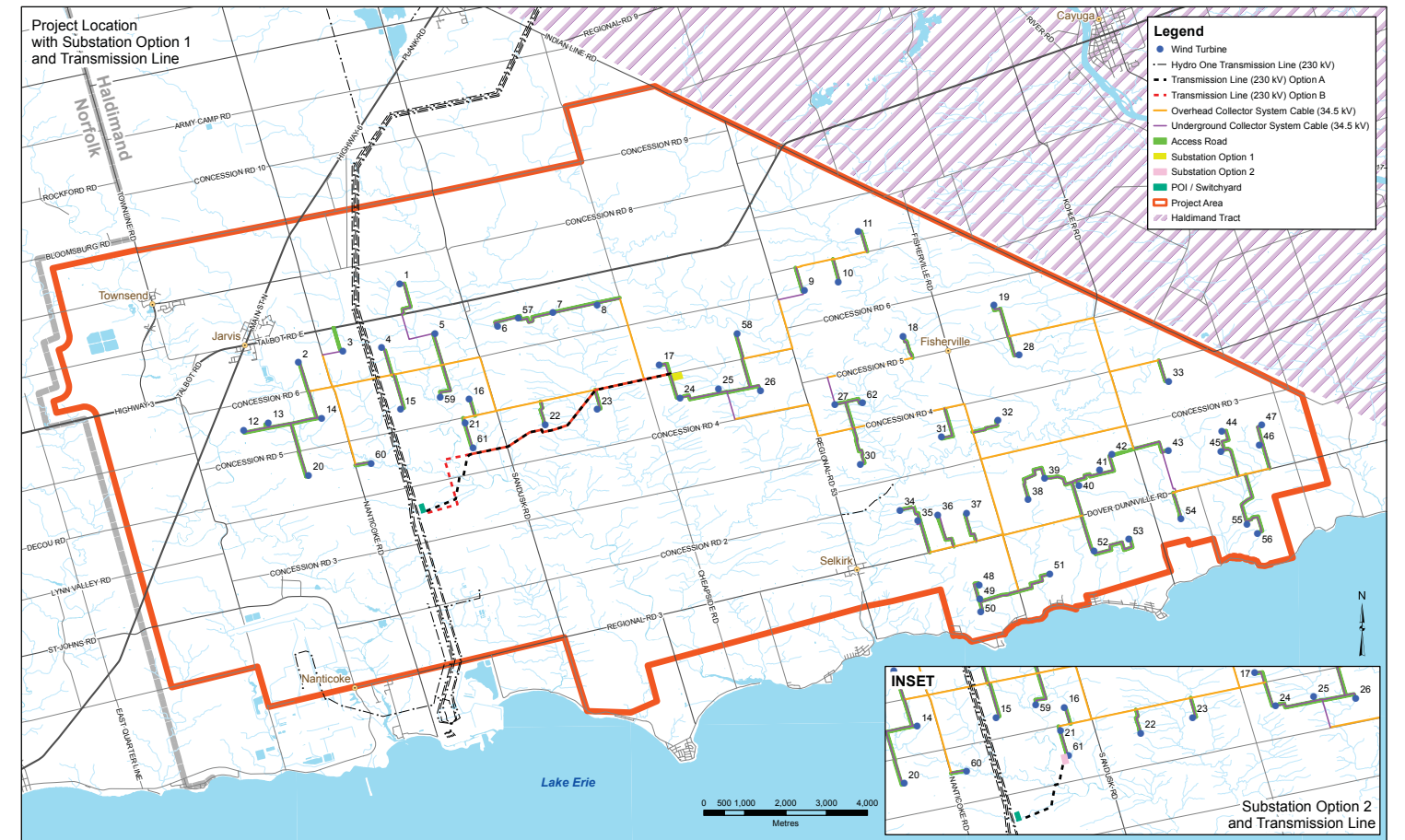
DESIGN AND OPERATIONS REPORT SUMMARY

Fall 2010

The Project reports for Summerhaven Wind Energy Centre are shown below. This summary outlines the Design and Operations Report. The reports presently available for review are:



- Project Description Report
- Construction Plan Report
- Design and Operations Report**
- Decommissioning Plan Report
- Wind Turbine Specifications Report
- Natural Heritage Report
- Water Assessment Report
- Heritage Assessment Report
- Noise Study Report
- Archaeological Assessment Report
- Site Plan Report



The following is a summary of the Design and Operations Report for the Summerhaven Wind Energy Centre. The Report describes the location, operation and maintenance of the wind turbines, as well as potential environmental effects and health and safety concerns that may arise. For more detailed information please refer to the Design and Operations Report.

DESIGN PLAN

The Project area covers approximately 22,583 hectares of private land and public right-of-way near Nanticoke in Haldimand County. There will be up to 61 wind turbines, shown as the blue dots on the map above. Each turbine will have three blades and will stand 80 metres high, which is similar to a 26-storey building. The wind turbines will be built on concrete foundations that will go up to 3 meters below the ground. The green lines on the map show the 54 km of gravel access roads that will be needed to access the wind turbines. Underground power cables are identified by the purple lines on the map and above ground power cables are the orange lines. The Project will also include two weather towers to monitor wind conditions and a substation, which will increase the electrical voltage for distribution through the Hydro One Transmission Line.

DESIGN OPTIONS

There are two substation and transmission line options currently being considered for the Project. The final decision on which option will be used will be made before submitting the final Renewable Energy Approval (REA) Application. This decision will be based on discussions with Haldimand Hydro, outcomes of consultation process, and predicted environmental effects.



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OPERATIONS AND MAINTENANCE

The Project will be ready to produce electricity in 2012 and will operate for about 25 years. Six to eight full-time workers will maintain and operate the turbines. Each turbine will have automated control systems that report how they are functioning. Weather conditions and turbine operations will be monitored remotely by a Project employee. Maintenance of turbines is scheduled once every 6 months during operations. The wind turbines do not need fuel to run, but they do need oil to make sure the parts work properly, just like a car's engine. Oil and lubricants in the gearboxes and hydraulic systems will be changed regularly. The turbines will also be inspected and tested regularly, and parts may need to be replaced and tightened periodically.

WIND AND STORMS

The wind turbines are built to deal with storms that include high winds and lightning. If wind speeds are faster than 47 km per hour, the blades will feather out of the wind to minimize the pressure being put on the wind turbines.

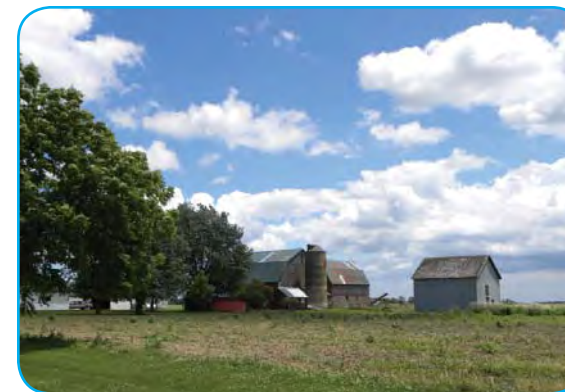
The turbines are also equipped with lightning protection and detectors. If a turbine is hit by lightning, the electricity will be directed away from the blades so they are not badly damaged. The detectors attached to each blade will record information about the lightning strike, such as which blade was hit and how powerful the lightning was.

EMERGENCY RESPONSE

In the rare instance that the wind power facility exceeds operational parameters or there is an emergency, the appropriate regulatory agencies, Haldimand County, local residents and Aboriginal communities will be notified using the procedures outlined below. Aboriginal communities will be contacted to assign a key contact for emergency purposes and information will be posted in the local band office.

Haldimand County, the Ministry of the Environment and Aboriginal communities will be contacted by NextEra Energy Canada within 8 hours of an emergency. A hard copy incident response report will be provided to the Ministry of the Environment within 24 hours of the emergency.

In the case of an emergency requiring First Responders (e.g., fire department, emergency medical services), NextEra Energy Canada will contact the appropriate First Responder directly upon discovery of the emergency, following the Emergency Action Plan developed for the Project.



NATURAL HERITAGE

Wind turbines may disturb wildlife in the area. Birds could fly away and abandon their nests or have trouble breeding. Birds and bats may also fly into the turbine blades, although evidence shows that this is less likely for birds.

The Project layout was designed to avoid significant natural features. Bird and bat migration patterns and breeding surveys were used to help develop the Project layout and to choose the turbine lighting. Mortality rates for birds and bats will be monitored during the first two years of operations to ensure that rates are not higher than predicted.

NOISE

The wind turbines will emit sound to the environment that will range between non-perceptible over background to levels associated with distant traffic. To minimize the potential noise effects, the turbines and substation will be located at least 550 m from the closest non-participating homes. The sound made by the turbines and any related complaints by local residents will also be monitored. NextEra is committed to investigating any potential complaints, and will make a call-in number available for local residents with concerns.

COMMUNICATIONS

Local residents and Aboriginal communities will be notified of Project activities through periodic updates. A telephone number will also be provided to contact operations staff. Relevant communications will be tracked and the Ministry of the Environment will be notified of concerns related to Project operations.



PROJECT DESCRIPTION REPORT SUMMARY

Fall 2010

The Project reports for Summerhaven Wind Energy Centre are shown below. This summary outlines the Project Description Report. The reports presently available for review are:



Project Description Report

Construction Plan Report

Design and Operations Report

Decommissioning Plan Report

Wind Turbine Specifications Report

Natural Heritage Report

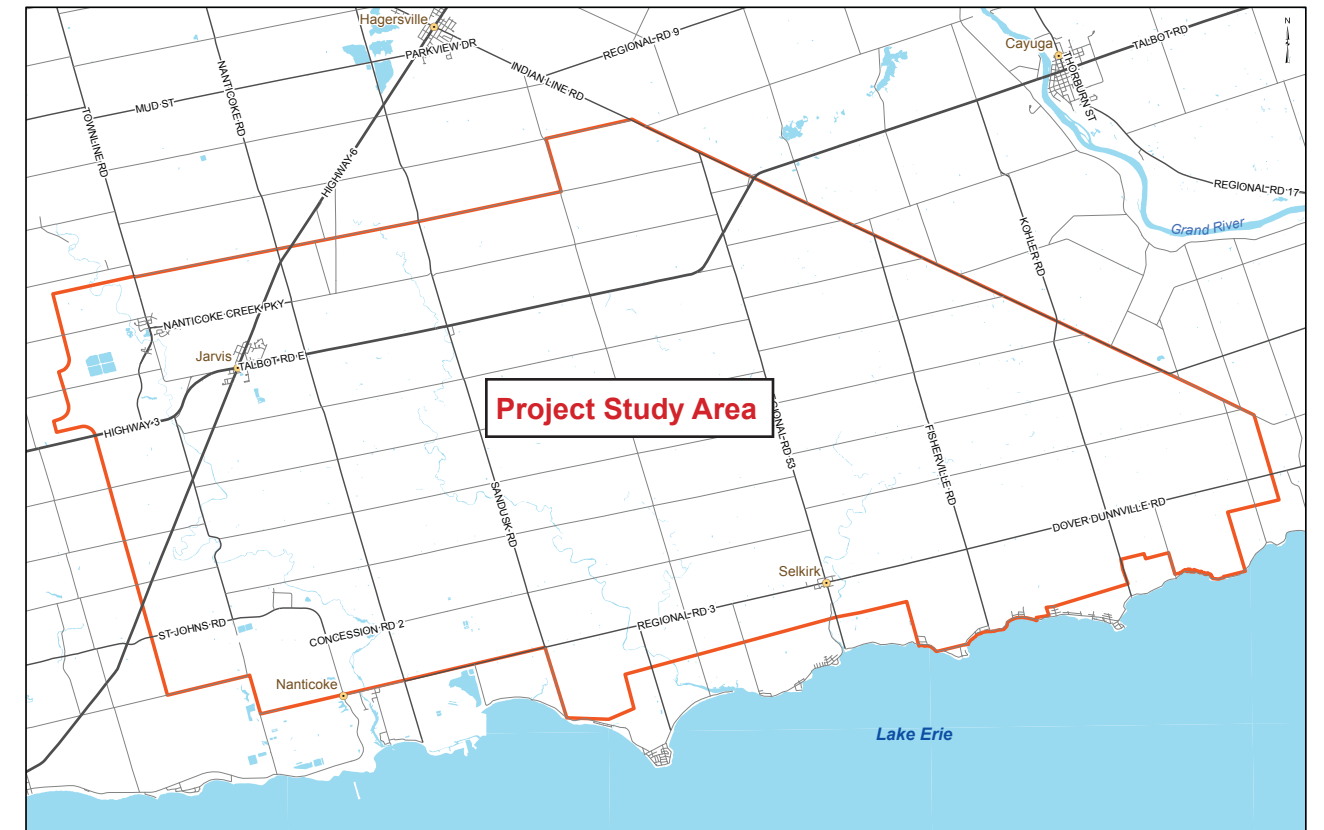
Water Assessment Report

Heritage Assessment Report

Noise Study Report

Archaeological Assessment Report

Site Plan Report



The following is a summary of the Project Description Report for the Summerhaven Wind Energy Centre. The report describes the Project location, Project phases and potential environmental effects. For complete information please refer to the Summerhaven Wind Energy Centre Project Description Report which can be found at the Haldimand County municipal office and on our website at www.CanadianWindProposals.com.

PROJECT OVERVIEW

The goal of the Summerhaven Wind Energy Centre is to generate electricity from the wind using up to 61 wind turbines. Each turbine is designed to produce 2.221 megawatts (MW) of electricity. The nameplate capacity of the entire Project, or the maximum amount of electricity that the wind turbines can produce, is 135.5 MW.

Other Project components include a substation, which increases the electrical voltage and the transmission line that carries the electricity to the Hydro One corridor and an operations and maintenance building, which will be located beside the substation. Access roads will allow personnel and equipment to access turbines, underground and overhead cables will connect the turbines to each other, and two weather towers will monitor wind speeds for Project operations.

PROJECT LOCATION

The Project Study Area includes 22,583 hectares of private land and country road easements in Haldimand County. The Project Study Area is primarily rural, agricultural land. The general area was chosen because of good wind conditions, and because Haldimand County's Official Plan supports renewable energy projects, economic investment and the creation of a green economy.

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NEXTERA ENERGY CANADA

A LEADER IN CLEAN ENERGY

The Summerhaven Wind Energy Centre is being proposed by NextEra Energy Canada, ULC, formerly known as FPLE Canadian Wind, ULC. NextEra Energy Canada is one of North America's largest wind energy owners and operators. NextEra Energy Resources has approximately 18,000 MW of generation capacity including over 9,000 wind turbines operating across North America.

Canadian wind farms currently owned and operated by NextEra Energy Canada include Pubnico Point (30.6 MW) in Nova Scotia and Mount Copper (54 MW) in Quebec. The headquarters for NextEra Energy Canada is located in Burlington, Ontario.

FACTS AT A GLANCE

- Largest generator of wind power in North America
- Largest generator of solar power in North America
- Approximately 4,500 employees
- Nearly 90 facilities in operation in 25 states and provinces in Canada
- Over 18,000 megawatts of generating capacity in operation

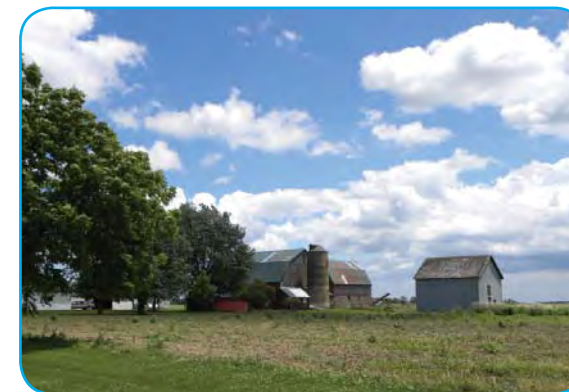
HISTORY OF THE PROJECT

The Project was originally two separate projects, namely the Air Energy TCI Inc (AET) "Nanticoke Wind Farm" and the Next Era Energy Canada, ULC (NextEra Energy Canada) "Summerhaven Wind Farm". The new combined Project, is called the "Summerhaven Wind Energy Centre". Both former projects had published a Notice of Commencement, prior to the regulations changing in September 2009.

In November 2009, AET sold all rights to the former Nanticoke Wind Farm Project to NextEra Energy Canada; effectively transferring ownership of the Project and merging the two projects.



NEXTERA ENERGY RESOURCES' NORTH AMERICAN PORTFOLIO



AIR QUALITY

Wind energy is considered a form of clean energy as there are almost no emissions from the turbines while they are in operation. Increased traffic and the use of heavy machinery during construction could be a nuisance to humans and animals by creating dust and noise. Dust suppressants will be used on roads to decrease the amount of dust that is created. Where possible, exposed soil piles will be covered with plastic sheets to reduce dust emissions and avoid transport of dust to waterbodies or vegetation. However, dust and noise generated during construction is not expected to be greater than that generated by large agricultural equipment.

WATER

A minor amount of vegetation will be cleared during construction and soil may be compacted by traffic and heavy machinery. When soil is cleared or compacted, rain water absorption will be reduced nominally. Stormwater run-off can cause adverse changes or disruptions to vegetation and species on land and in water. To minimize these effects, exposed soil will be covered with tarps or plastic sheets. A fence that acts as a soil filter, called a "silt fence", will also be built around streams and wetlands to protect them from soil run-off. Soils will be revegetated after construction to reduce overland sediment transport. Following a monitoring plan, streams will be monitored by an Environmental Compliance Monitor to check for increased flow rates and sediments. For further details please refer to the Water Assessment Report.

HERITAGE AND ARCHAEOLOGY

Construction excavations and land clearing could have negative effects on archaeological resources in the Project area. If artifacts or features are discovered in areas where construction is planned, they will be preserved either by changing the Project layout or removing and archiving them. Extensive archaeology work including Stage 1, Stage 2 and Stage 3 surveys are being conducted for this Project. First Nations monitors and/or field technicians from Six Nations and Mississaugas of New Credit First Nations participated in all field studies.

Archaeological and Heritage Assessment Reports will be submitted to the Ministry of Tourism and Culture for approval before construction begins. For further details of the work completed to date please refer to the Archaeological Assessment Report and the Heritage Assessment Report.



HEALTH AND SAFETY

CONSTRUCTION SAFETY

All construction workers will be trained to assess safety hazards and manage risks related to operating heavy machinery. Holes and trenches will be fenced off to avoid injury. Warning signs and temporary road closures will be put in place to keep construction areas secure following a Traffic Management Plan devised by the selected contractor.

TRANSPORTATION AND WASTE

Transportation of heavy turbine components on local roads may cause minor damage to roads and can slow down moving traffic. A Traffic Management Plan will be created by the construction contractor and approved by the County. This will determine which roads are better able to accommodate heavy loads, how to avoid traffic flow disruptions, and steps that will be taken to repair any damage.

Construction waste will be managed, and consultation with licensed landfills will be undertaken to determine the nearest acceptable facility that can accept the waste.

ACCIDENTAL SPILLS

Accidental spills of fuel or oil could potentially occur during construction equipment refueling, maintenance or operation, which could contaminate soils. Fueling up in designated areas will reduce the potential for spills. Should a spill occur, construction workers will be trained in spill response and will keep the spill from spreading using spill kits kept at the construction sites.



NOISE

The wind turbines will emit sound to the environment that will range between non-perceptible over background to levels associated with distant traffic. To minimize the potential noise effects, the turbines and substation will be located at least 550 metres from the closest non-participating homes, and from schools and places of worship. The sound made by the turbines and any related complaints by local residents will also be monitored. NextEra is committed to investigating any potential complaints, and will make a call-in number available for local residents with concerns.

For further details please refer to the Noise Study Report.

STORMS AND LIGHTNING

The wind turbines are designed to withstand storms that include high winds and lightning. If wind speeds are faster than 47 km per hour, the blades will feather out of the wind to minimize the pressure being put on the wind turbines.

The wind turbines are also equipped with lightning protection. If a wind turbine is hit by lightning, the electricity will be directed away from the blades so they are not damaged. The detectors attached to each blade will record information about the lightning strike, such as which blade was hit and how powerful the strike was.

This information is automatically relayed to the operations building and operations staff so that potential damage can be assessed.

EMERGENCY RESPONSE

An emergency response plan will be created to deal with any emergencies at the Project location. The Plan will be given to the appropriate regulatory agencies, Haldimand County, local residents and Aboriginal communities and will provide contact information, evacuation procedures, an incident response plan, a spill response plan, and information regarding turbine operations, safety features and what emergency workers can expect when they arrive on site.

NATURAL HERITAGE

The Natural Heritage Assessment included a records review of natural features such as woodlots, water bodies, and wetlands within the Project Area, site investigations, and evaluations of natural features that are within 120 m of the Project area. In order to reduce potential negative environmental effects, the results of the records review and field surveys were used to develop the Project layout.

Most of the Project Area is open field; however, some land may have to be cleared for construction of access roads and cable systems. The protection of existing woodlots and other significant natural features was a key consideration in turbine and road siting. Existing roads will be used wherever possible to minimize disruption to wild plants and animals. Where watercourses are crossed by cables or temporary culverts or bridges, the approach will follow requirements of Fisheries and Oceans Canada and the Long Point Region Conservation Authority in order to protect aquatic life and water.

Wind turbine operation has the potential to displace some wildlife as a result of sensory or habitat disturbance, and there is potential that birds and bats could run into the turbine blades and be killed. Results of bird migration studies, breeding surveys, and monitoring of bat routes and maternity areas were considered closely in the development of the Project layout. Mortality rates for birds and bats will be monitored during the initial years of operations, following a monitoring plan agreed to by the Ministry of Natural Resources. For further details please refer to the Natural Heritage Report.

SOIL

During construction soil will be excavated and backfilled in a way that ensures the original soil make-up and soil horizons are maintained.

Any soil excavated during the Construction Phase will be stored in stockpiles. These stockpiles will be covered to prevent erosion and loss of soil. Once construction is complete the soil will be replaced in the reverse order that it was removed and the land will be reclaimed and revegetated with appropriate species.

During the Decommissioning Phase soil on Project lands will be tested for contaminants to make sure that farmers are able to grow healthy crops suitable for human consumption. Additional soil will be brought in to fill in excavated areas so that the land can be returned to its original use.



PRE-CONSTRUCTION

The pre-construction phase includes optioning lands, design and engineering, site surveys of the finalized turbine locations, purchasing Project equipment, and obtaining government permits.

CONSTRUCTION

The first step in construction will be to finalize geotechnical studies. A centralized area for construction field offices and temporary storage will be created. Gravel access roads will also be created and existing roads will be upgraded to access the turbine locations. Temporary storage facilities and laydown areas near each turbine site will be constructed, to use as work spaces. The turbine foundation holes will be dug and reinforced foundation structures will be built inside the excavations. Foundations will be poured concrete and covered with soil.

The turbines will be trucked to the site in sections and erected piece by piece using 3 cranes. Underground cables will connect turbines to each other and to the substation. Overhead transmission lines will connect the substation to the Hydro One corridor at the point of interconnect.

Before operations begin, construction materials and debris will be collected and disposed of properly, equipment and vehicles will be removed and disturbed soil will be reclaimed. Finally, the turbines will be tested and inspected to make sure that the electrical, mechanical and communications systems are ready for operations.

OPERATIONS

The turbines will generate electricity for approximately 25 years, beginning in 2012. The turbines will be monitored and maintained by a full time staff of 6 to 8 people. Scheduled service visits will include changing oil, cleaning and lubricating gearboxes and replacing worn parts. Routine maintenance visits will occur as required by the manufacturer and will involve temporarily removing the individual turbines from service and windsmiths ascending the tower to carry out maintenance activities.

DECOMMISSIONING

At the end of their operational life, all above ground turbine components will be removed and the top 1m of foundations will be removed and backfilled with earth to a depth that can once again be used as farmland. All underground cables will be cut and their ends buried below 1m depth, because they are inert and completely removing cables would result in a large amount of disturbance to the land. The substation and above ground cables will be removed, and access roads will be removed and land restored to the pre-construction land use as agreed to with individual landowners. Components that continue to have use or market value will be refurbished and reused or recycled, where possible, following applicable regulations and guidelines.



SCHEDULE*

PRE-CONSTRUCTION

June 2007
to June 2011

COMMISSIONING

January 2012

CONSTRUCTION

July 2011
to January 2012

OPERATIONS

January 2012 to
December 2037

DECOMMISSIONING OR REPOWERING

January 2038

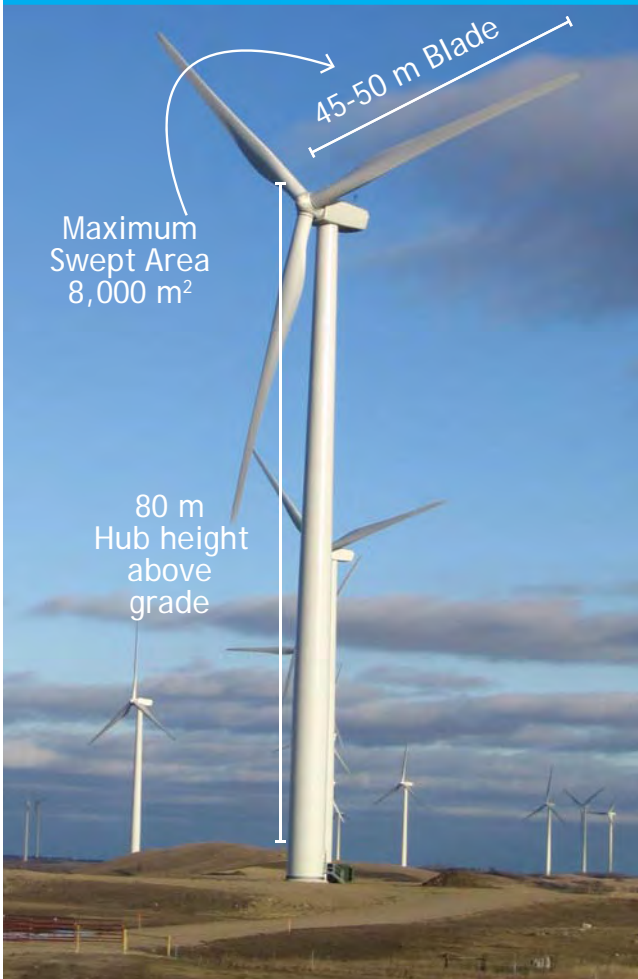
* Subject to Obtaining
Renewable Energy Approval
from Director of MOE

WIND TURBINE SPECIFICATIONS

REPORT SUMMARY

Fall 2010

PROPOSED WIND TURBINES: SIEMENS 101 2.221 MW AND SIEMENS 93 2.221 MW MODELS



Turbine Blades

The Siemens 101 model has 50 metre long blades, while the Siemens 93 model has 45 metre blades. Both models have three blades. The distance from the tip of one blade to the tip of the other is about 100 metres, the same length as a football field. The turbine blades will cover a total swept area of 8,000 square-metres for the Siemens 101 and 6,800 square-metres for the 93.

Lightning Protection

The turbine is equipped to be protected from lightning storms. All components are grounded and the tower acts as a conductor from the nacelle to the earth.

Nacelle

The nacelle houses the turbine and gearbox. It is climate controlled and is constructed from steel and fibreglass. The nacelle weighs approximately 82 tons.

Tower

Standing 80 metres high, the turbines will be as tall as a 26-storey building. The tower weighs approximately 162 tons.

Foundation

Geotechnical studies will be conducted at each turbine location. The foundations will be 290 square metres and are made of rebar and formwork filled with cast in place concrete. Foundations typically extend to a depth of 3m or less and only a small portion of this will be visible after the foundation is backfilled with earth.

PRODUCING ELECTRICITY

Each turbine has a maximum capacity to produce 2.221 megawatts (MW) of electricity, however, wind turbines do not spin constantly. They are designed to produce electricity at a specific range of wind speeds.

The cut-in wind speed is the minimum amount of wind needed for turbines to start producing electricity. The turbines used in the Project have a cut-in wind speed of 4 metres per second (10 km per hour). Cut-out wind speed refers to the maximum amount of wind the turbines can handle while they are operating. The turbines used in the Project have a cut-out wind speed of 25 metres per second (90 km per hour). If the wind is stronger than this, the turbines will turn off so they will not be damaged.

The rated wind speed of the turbines is 12 to 13 metres per second (45 km per hour). This is the wind speed that will generate the highest amount of power. The wind turbines that will be used in the Summerhaven Wind Energy Centre have a maximum sound power rating of 105 dBA while in use.



The Project reports for Summerhaven Wind Energy Centre are shown below. This summary outlines the Wind Turbine Specifications Report. The reports presently available for review are:



Project Description Report

Construction Plan Report

Design and Operations Report

Decommissioning Plan Report

Wind Turbine Specifications Report

Natural Heritage Report

Water Assessment Report

Heritage Assessment Report

Noise Study Report

Archaeological Assessment Report

Site Plan report

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WATER ASSESSMENT REPORT SUMMARY

Fall 2010

The Project reports for Summerhaven Wind Energy Centre are shown below. This summary outlines the Water Assessment Report. The reports presently available for review are:



- Project Description Report
- Construction Plan Report
- Design and Operations Report
- Decommissioning Plan Report
- Wind Turbine Specifications Report
- Natural Heritage Report
- Water Assessment Report**
- Heritage Assessment Report
- Noise Study Report
- Archaeological Assessment Report
- Site Plan Report

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The following is a summary of the Water Assessment Report for the Summerhaven Wind Energy Centre Project. The Report identifies defined water bodies and addresses potential negative effects from the Project. The Regulation requires that:

- No turbine or transformer station be located within 30 m of a water body
- Distance from the turbine to water body is measured from the turbine blade tip
- When infrastructure is placed or ground disturbance occurs within 120 m of a water body a report must be prepared that assesses the environmental effects, identifies mitigation and details monitoring.

In order to determine the presence of water bodies and their distance to the Project, a records review and site investigation were conducted. For complete information please refer to the Summerhaven Wind Energy Centre Water Assessment Report.



RECORDS REVIEW

Water bodies were first identified using the Natural Resources and Values Information System base data. GIS was used to determine instances of a Project component occurring within 120 m of a water body. Regulation limit mapping was also acquired from the Long Point Region Conservation Authority.

SITE INVESTIGATION

The site investigation confirmed the information collected during the records review with a field program that took place from June to September 2010.

The site investigation discovered that a large number of the water features identified in the records review did not meet the regulatory definition of a water body. For example, a grassed waterway or temporary surface drainage channel is not considered a water body under the regulation. Water bodies such as these can have a turbine located within 120 m of them without requiring a full assessment of potential effects.

The investigation found 28 water bodies within 120 m of the Project Location; 18 of which had water and were presumed to be permanent and the remainder dry or intermittent.



IMPACT ASSESSMENT

WATER QUANTITY

The Project will result in a small increase in paved areas and gravel roads within the Project Study Area. This increase will result in a small increase in stormwater runoff, or the quantity of water leaving the Project Study Area during rain storms. The largest increase will be during construction and is estimated to be 0.34% more than the existing amount.

WATER QUALITY

Water quality could be affected by increased soil erosion from vegetation removal. Soil could be washed into watercourses from soil stockpiles or from mud that is tracked onto roads by construction equipment. All watercourse crossings of cable lines and roads will follow Department of Fisheries and Oceans (DFO) Operational Statements wherever possible. The Operational Statements are available on the DFO website and are intended to inform Canadians about how to protect fish and fish habitat and comply with the Fisheries Act by providing “bottom line” advice for different types of low risk activities.

Construction will occur during dry conditions where possible. Temporary dams and pumping will take place where needed. Where required, stormwater runoff will pass through silt fences and culvert inlet sediment traps before leaving the construction site. Soil stabilization Best Management Practices, including temporary and permanent seeding, mulching, nets and baskets, plastic covering and dust control, will prevent soil particles from being transported in stormwater runoff during the construction and the duration of the Project.

DIRECT DISTURBANCE

Direct disturbances to water courses could occur from soil compaction and vegetation removal during construction. Punch and bore crossings will be used where underground cables must cross streams. Some clear span bridge structures will need to be built for access to road stream crossings. All activities will follow Department of Fisheries and Oceans Operational Statements and employ agency acceptable Best Management Practices to ensure minimal disturbance.

Machine exclusion zones will be established to protect special areas from construction by setting them aside as off-limits for vegetation removal. These areas include: stream buffers, forest conservation areas, wetlands, springs, steep slopes and environmental areas.



ACCIDENTAL SPILLS

Accidental spills are possible, but appropriate response measures will be in place, including

- Good housekeeping
- Preventative maintenance
- Spill prevention and control plans
- Erosion and sediment control
- Best Management Practices

Risk of contamination of surface or ground water will be managed through proper materials identification, transport and disposal daily construction meetings coupled with good housekeeping will ensure that the site is kept clean, well organized and free of debris and that any concerns are addressed promptly.

MONITORING

An Environmental Compliance Monitor will be on-site for the duration of construction activities to ensure that environmental regulations are being adhered to by construction contractors. The Monitor can stop work on site if regulations are not being met until conditions are improved.

Drainage inspections will take place after storm events and will be visually monitored for increased levels of erosion and sedimentation. If turbidity increase is observed, samples will be taken and compared to criteria for aquatic life.

Drainage will be monitored on a daily basis for spills or oily residue. Spills will be contained immediately following practices required by the Ministry of the Environment. Following an accidental spill, a response plan will be implemented, including containment and remediation of the contaminated area.

The Project reports for Summerhaven Wind Energy Centre are shown below. This summary outlines the Natural Heritage Report. The reports presently available for review are:



- Project Description Report
- Construction Plan Report
- Design and Operations Report
- Decommissioning Plan Report
- Wind Turbine Specifications Report
- Natural Heritage Report**
- Water Assessment Report
- Heritage Assessment Report
- Noise Study Report
- Archaeological Assessment Report
- Site Plan Report

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The following is a summary of the Natural Heritage Report for the Summerhaven Wind Energy Centre. Significant natural features may not be disturbed without completing an Environmental Impact Statement (EIS) that identifies and describes: potential negative effects, mitigation measures, and outlines an environmental effects monitoring plan. Natural features were identified through a records review and site investigations. The significance of natural features were evaluated and an EIS was completed where required. For more detailed information please refer to the complete Natural Heritage Report.

RECORDS REVIEW

A records review involves finding, reviewing and summarizing existing information about natural heritage features that have boundaries within 120 m of the Project. Types of records reviewed relate to natural features, species at risk, water bodies, mineral resources and petroleum resources. Some key sources for information about the Project Study Area were:

- Ministry of Natural Resources
- Natural Heritage Information Centre
- Land Information Ontario
- Long Point Region Conservation Authority
- Haldimand County
- Scientific reports and unpublished literature
- Members of the Public and Aboriginal communities



SITE INVESTIGATIONS

Site investigations include planning and undertaking field work, then compiling and reporting the results. This entails a physical investigation of the air, land and water within 120 m of the Project location, and determines:

- If any additional natural features exist
- If the mapped boundaries of natural features are correct
- The distance between the Project and nearby natural features
- The function, form and attributes of the natural features

EVALUATION

Using information from the records review and site investigation, observations were compared against Ministry of Natural Resources accepted standards, guidelines and literature to make an informed decision about the overall value, or significance of each natural feature within 120 m of the Project. Natural feature attributes which contribute to the evaluation of significance include:

- Whether a drainage features meets the regulatory definition of “water body”
- Classification of fish habitat potential in water bodies
- Presence of species at risk or species of conservation concern
- Significance of woodlands based on woodland area, species composition and number of different sized trees
- Significance of wildlife habitat
- Presence and significance of wetlands
- Presence and significance of valleylands



FIELD SURVEYS

BIRDS

Avian use surveys for Tundra swans, waterfowl and raptors were conducted by Golder throughout the winter, breeding season and fall migration period of 2008 and spring migration period of 2009. Surveys included roadside counts and covered all natural habitats. Additional bird surveys were completed by Dave Martin, an independent biologist in 2009.

Thousands of individual birds and 150 different bird species were recorded during the surveys. The most common species observed were red-winged blackbird, common grackle, common merganser, European starling, Canada goose, snow bunting and rock pigeon. Eight different species at risk birds were also observed during the field studies. For a complete list please refer to the Natural Heritage Report.

For all bird species and seasons combined, 72 % of all flying birds, were below the rotor-swept height, 27 % were within the rotor-swept height, and 1 % were observed flying above the rotor-swept height.

BATS

Bat field surveys used a three step approach:

- Desktop community classification
- Daytime habitat assessment
- Bat Use Survey at sunset during June

Three bat communities within 120 m of turbines were classified during the daytime community classification to be "candidate maternity roost communities." Species identified included big brown/silver-haired, myotis, red bat and hoary bat.

POTENTIAL EFFECTS

Potential effects of the Project are expected to be minimal and ongoing environmental monitoring will take place to confirm expectations. Sensory disturbance during construction is likely to have the largest impact, however other potential effects include bird and bat mortality, corridor habitat disturbance, turtle nesting, habitat disturbance and raptor breeding disturbance.

MITIGATION

Most potential negative effects will be mitigated by following Best Management Practices. Additional measures will include:

- Scheduling construction to avoid breeding season
- Conducting nest surveys before construction
- Environmental Compliance Monitors

SIGNIFICANT FEATURES

WOODLANDS

There are 84 vegetation communities that have boundaries which are within 120 m of the Project location, including disturbance areas. These range in size from less than 0.01 hectare to almost 72 hectares, with the average size being 2.8 hectares. Of the 84 woodlands within the Project Location, 50 have been determined to be significant, based on Golder's preliminary evaluation. The majority of the Project is located outside of woodlands and negative effects to woodlands are not expected.

VALLEYLANDS

A valleyland is defined as a natural area that occurs in a valley and has water flowing through or standing for some period of the year. Information on existing valleylands did not exist. Golder used the County Hazard Lands map to determine possible valleylands, as suggested by the Ministry of Natural Resources. There were a total of 38 valleyland locations, of which 16 were classified as potentially significant according to the criteria set out in the Natural Heritage Reference Manual. Some work in and across valleylands will take place, but negative effects are not expected.

WETLANDS

No Provincially Significant Wetlands were located within 120 m of the Project Location. One wetland that has been evaluated by the Ministry of Natural Resources as a non-provincially significant wetland is within 120 m of the Project Location at two locations. An additional 6 wetlands were identified during the site investigations. Careful construction planning and Best Management Practices will protect wetland plants and animals, and connections between surface water and groundwater.

WATERBODIES AND FISH HABITAT

Of the 252 drainage features that were assessed, 28 were determined to be water bodies. By following Operational Statements issued by the Department of Fisheries and Oceans (DFO), the net loss of fish habitat or harm to fish themselves can be avoided. Five locations will require permanent or temporary water crossings and will require further consultation with DFO and the Long Point Region Conservation Authority to determine if an authorization under the Fisheries Act will be required.

