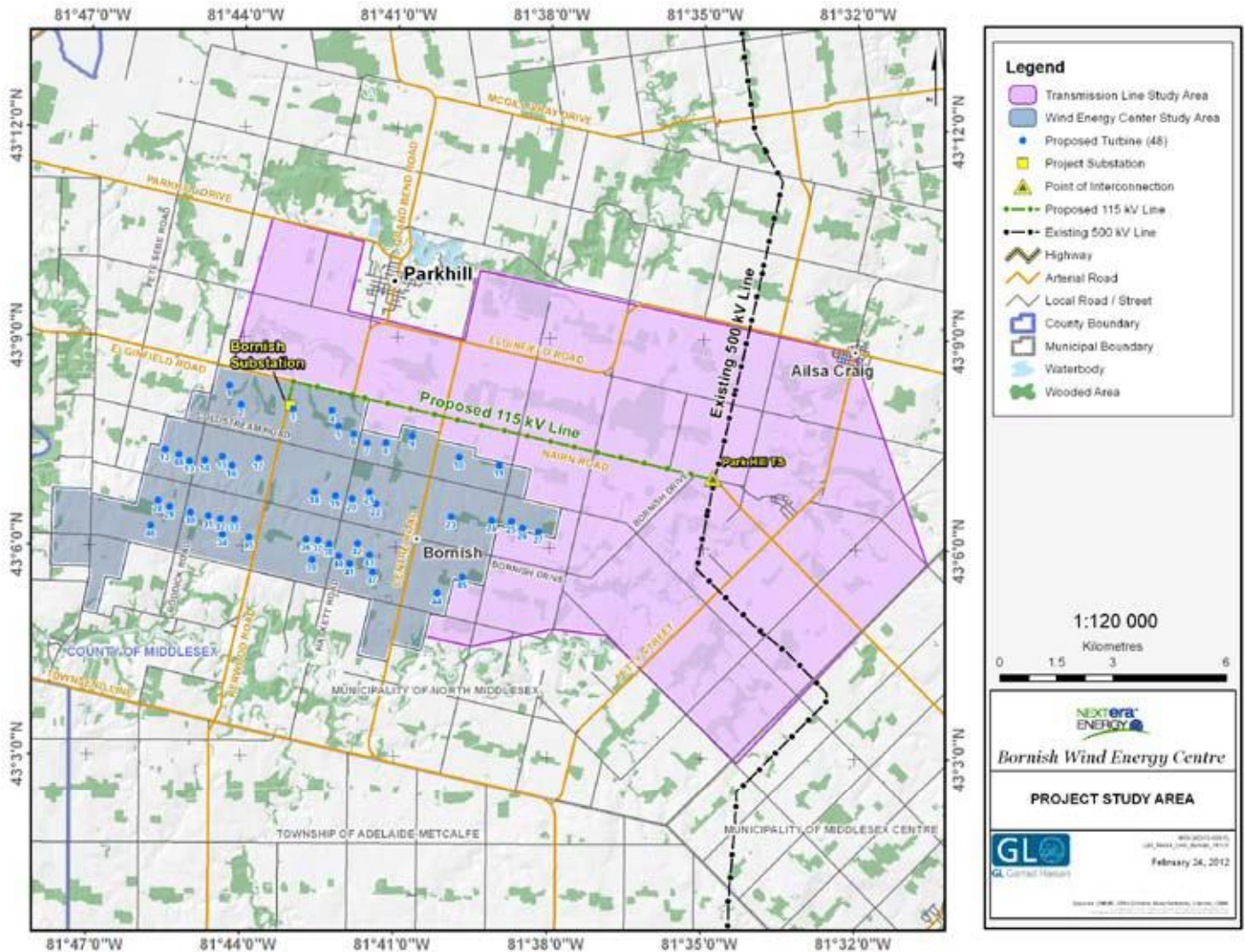


# BORNISH WIND ENERGY CENTRE

## Project Description Report Summary



### Have A Question?

We hope you find this Plain Language Summary helpful. In case you would like additional information or have any questions, please contact us directly:

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# BORNISH WIND ENERGY CENTRE

## Water Assessment and Waterbody Report Summary

APRIL 2012

Bornish Wind LP is proposing to develop the Bornish Wind Energy Centre (the "Project"). Bornish Wind LP is a wholly-owned subsidiary of NextEra Energy Canada ULC. The parent company of NextEra Energy Canada ULC is NextEra Energy Resources, LLC, with a current portfolio of nearly 8,500 operating wind turbines across North America. The Project is located in the Municipality of North Middlesex and will consist of 45, 1.62 MW turbines with a total nameplate capacity of 72.9 MW, though 48 turbine locations will be permitted.

The purpose of the Water Assessment and Water Body Report is to first identify water bodies within 120 metres (m) of the proposed Project Location (the Project Location is defined as outer limit of where disturbance will occur due to construction or operation of the Project), and then to identify potential effects, mitigation measures and residual effects, if any. Residual effects are "left over" effects once mitigation measures have been applied for these water bodies.



# BORNISH WIND ENERGY CENTRE

## Water Assessment and Waterbody Report Summary

### RECORDS REVIEW

Information gathered under this stage of the process was used to determine if there are any water bodies in the Project Location or within 120 m of the Project Location. This involved contacting the Ministry of Natural Resources, the Ministry of the Environment, the local Conservation Authority and the Municipalities to obtain any records they keep of water bodies within the Study Area.

The results of the Records Review identified 27 potential water body crossings and 47 potential water bodies present within 120 m of the high water mark of a permanent or intermittent stream (excluding those indicated as crossings).

### SITE INVESTIGATION

Following the Records Review, Site Investigations were conducted to confirm that the findings of the Records Review were correct, to identify any additional water bodies not documented in the Records Review, and finally to define the boundaries of the water bodies.

During the Site Investigations, an overall assessment of the water body was conducted based on a number of criteria including stream measurements, quality of fish habitat and the surrounding land uses (for example agriculture uses and any type of livestock, adjacent houses, roads, meadows or wetlands, etc.). Findings of the site investigations confirmed the presence of 17 water body features within the project area. A total of 21 sites within these features were identified as occurring within 120 m of a project component. No lakes, Lake Trout lakes, or seepage areas were identified within 120 m of the Bornish Wind Energy Centre project location.

### DESCRIPTION OF ENVIRONMENTAL EFFECTS

For each water body identified through the Site Investigation, potential effects were assessed and mitigation measures proposed depending on the type of project infrastructure affecting the feature.

Below is a summary of some of the potential effects, mitigation measures and monitoring commitments from the effects assessment. For the full effects assessment, please refer to the Water Assessment and Water Body Report.

### POTENTIAL EFFECTS FROM CONSTRUCTION/DECOMMISSIONING

- ✦ Erosion and sedimentation (i.e. increase in soil in watercourse) from clearing vegetation. To avoid or mitigate these effects, an erosion and sediment control plan will be developed before construction. Erosion blankets, erosion control fencing and straw bales will be used, where necessary to control erosion and prevent soil from entering the watercourse.



# BORNISH WIND ENERGY CENTRE

## Water Assessment and Waterbody Report Summary

- ✦ Degradation of fish habitat from access roads crossing water courses. To avoid or mitigate these effects, culverts will be designed and installed in a way that prevents barriers to fish movement, the culverts will be embedded below the stream bed to maintain water flow and the culverts will be regularly maintained to ensure debris does not build-up.
- ✦ Soil compaction which could increase water runoff into watercourses. To avoid or mitigate these effects, changes in land contours and natural drainage will be minimized and temporary storage basins will be installed to allow water to infiltrate, or permanent stormwater management facilities will be used as necessary. Prior to construction a Stormwater Pollution Prevention study will be conducted and submitted to the municipalities.

### POTENTIAL EFFECTS FROM OPERATION

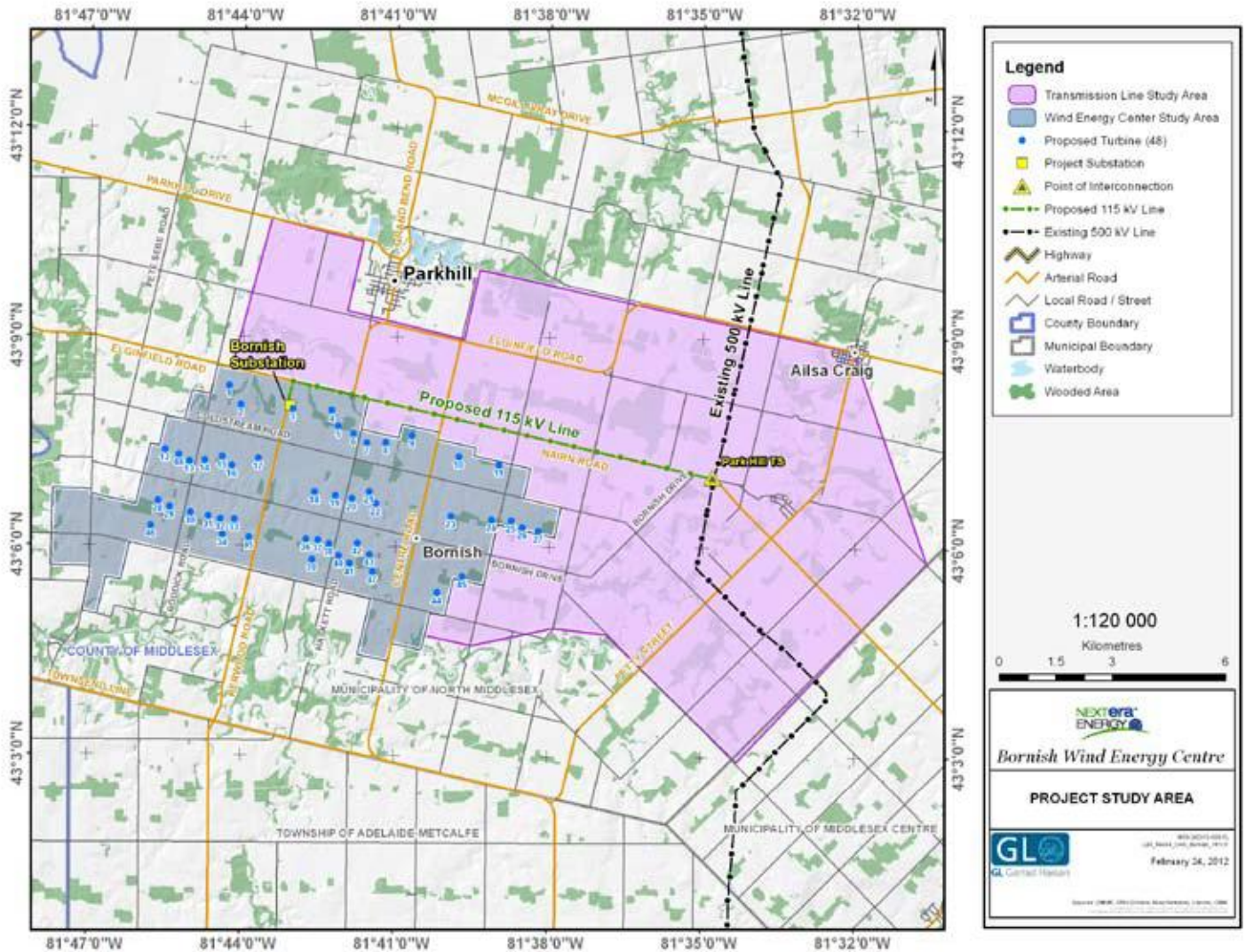
- ✦ Water contamination is possible, although unlikely, due to accidental spills associated with maintenance activities. A spill response plan will be developed and an emergency spill kit will be kept on site. In addition, the Ministry of the Environment and the local municipalities will be notified of any spills, if required.

***The overall conclusion of the Water Assessment and Water Body Report is that this Project can be constructed and operated without any remaining effects that could harm the environment.***



# BORNISH WIND ENERGY CENTRE

## Water Assessment and Waterbody Report Summary



### Have A Question?

We hope you find this Plain Language Summary helpful. In case you would like additional information or have any questions, please contact us directly:

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# BORNISH WIND ENERGY CENTRE

## Wind Turbine Specification Report Summary

APRIL 2012

Bornish Wind LP is proposing to develop the Bornish Wind Energy Centre (the "Project"). Bornish Wind LP is a wholly-owned subsidiary of NextEra Energy Canada ULC. The parent company of NextEra Energy Canada ULC is NextEra Energy Resources, LLC, with a current portfolio of nearly 8,500 operating wind turbines across North America. The Project is located in the Municipality of North Middlesex and will consist of 45, 1.62 MW turbines with a total nameplate capacity of 72.9 MW, though 48 turbine locations will be permitted.

The purpose of the Wind Turbine Specification Report is to provide specific information on the turbine proposed for the Project; this includes the size, sound levels and the amount of electricity produced.



# BORNISH WIND ENERGY CENTRE

## Wind Turbine Specification Report Summary

### TURBINE SPECIFICATIONS

#### BLADES AND TOWER

The wind turbine technology proposed for this Project is the 1.62 megawatt GE model wind turbine. The turbines are 80 m tall with three, approximately 50 m long blades.

#### LIGHTING

Some of the wind turbines will have external lighting in accordance with the requirements of Transport Canada (TC) for aviation safety. NextEra will consult with TC regarding the number of turbines requiring lighting.

#### TURBINE MONITORING

The wind turbines are continuously monitored throughout the operations phase of the Project. The turbines are equipped with a mechanism for automatically or manually controlling the turbines, either from the control centre or from the actual turbine.

#### BRAKE SYSTEM

To stop turbine operation braking is accomplished by feathering the blades out of the wind – meaning that each blade rotates so it no longer catches wind.

Specification	Turbine
<b>Make</b>	General Electric
<b>Model</b>	1.62-100
<b>Name Plate Capacity</b>	1.6 MW
<b>Hub Height</b>	80 m
<b>Rotor Diameter</b>	100 m
<b>Minimum Rotational Speed</b>	9.75 rpm
<b>Maximum Rotational Speed</b>	16.2 rpm

# BORNISH WIND ENERGY CENTRE

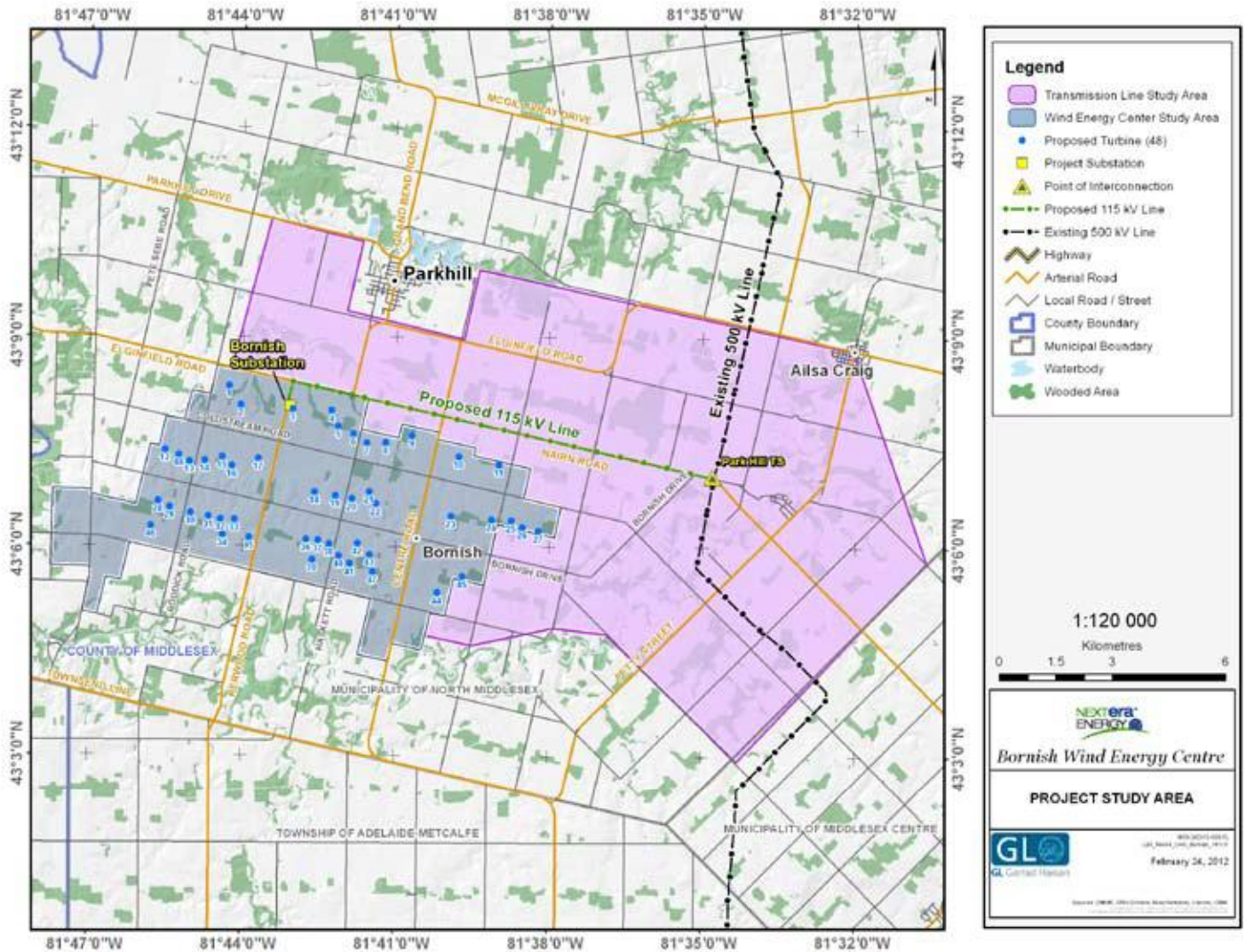
## Wind Turbine Specification Report Summary





# BORNISH WIND ENERGY CENTRE

## Wind Turbine Specification Report Summary



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# BORNISH WIND ENERGY CENTRE

## Construction Plan Report Summary

APRIL 2012

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The purpose of the Construction Plan Report is to describe all activities that are part of the Project's construction phase so that possible negative environmental effects can be identified. The report also presents mitigation measures/monitoring commitments and residual effects, if any. Residual effects are "left over" effects once mitigation measures have been applied.



# BORNISH WIND ENERGY CENTRE

## Construction Plan Report Summary

### DESCRIPTION OF CONSTRUCTION AND INSTALLATION ACTIVITIES

The table below presents the anticipated construction schedule and approximate order of construction activities for the proposed Project; although some construction activities will overlap. The construction phase of the Project is anticipated to begin in late summer/early fall 2013 and last 6 months.

### CONSTRUCTION SCHEDULE

(Activity)	MO	M1	M2	M3	M4	M5	M6
Surveying (prior to construction)	●						
Geotechnical Sampling (prior to construction)	●						
Land Clearing and Construction of Access Roads		●	●				
Temporary Crane Paths			●				
Installation of Culverts		●					
Construction of Laydown Area			●				
Turbine Site and Crane Pad Construction		●	●	●			
Delivery of Equipment		●	●	●	●	●	●
Construction of Turbine Foundations				●			
Wind Turbine Assembly and Installation				●	●	●	●
Construction of Electrical Collector System						●	●
Construction of Transformer Substation					●	●	●
Construction of Operations Building						●	●
Land clean up and Reclamation		●	●	●	●	●	●
Turbine Commissioning							●

# BORNISH WIND ENERGY CENTRE

## Construction Plan Report Summary

### CONSTRUCTION ACTIVITIES

#### SURVEYING AND GEOTECHNICAL STUDIES

- ✦ Surveys are required to identify locations of major Project components; this involves surveyors walking around the sites and marking locations using stakes.
- ✦ Geotechnical sampling is required to locate turbine foundations; this involves drilling boreholes (i.e. holes about 5 centimetres (cm) wide and 1 metre (m) deep drilled in the ground) to collect information on the type of soil below ground.

#### LAND CLEARING AND CONSTRUCTION OF ACCESS ROADS

- ✦ Access roads and crane paths will be 11 m wide during the construction phase and are required to transport equipment to the turbine location construction sites.
  - First, the land is cleared and the topsoil is removed, stored for later use and replaced with a layer of gravel.
  - Following construction, the gravel will be removed and replaced with topsoil; some access roads will remain in place for maintenance activities.

#### CONSTRUCTION OF LAYDOWN AREAS

- ✦ Construction laydown areas are approximately 4 hectares (ha) in size and are used to temporarily store construction equipment.
  - First, the land is cleared and topsoil is removed, stored for later use and replaced with a layer of gravel.
  - Following construction, the gravel will be removed and the topsoil returned.



# BORNISH WIND ENERGY CENTRE

## Construction Plan Reports Summary

### CONSTRUCTION OF TURBINE SITES AND CRANE PADS

- ✦ Turbine laydown areas are approximately 122 m by 122 m and are used to store wind turbine components during construction.
  - First, the turbine site is cleared and levelled and topsoil is removed, stored for later use.
- ✦ Crane pads are approximately 15 m by 35 m and are used to support the large cranes during construction, particularly when they lift the nacelle into place.
  - First, the topsoil is removed, stored for later use and replaced with a layer of gravel.
  - Following construction, the crane pad will be restored to pre-construction condition.

### CONSTRUCTION OF TURBINE FOUNDATIONS

- ✦ Turbine foundations are approximately 400 m<sup>2</sup>.
  - First, an area approximately 3 m deep x 20 m x 20 m is dug and the earth is stored for later use.
  - The foundations are shaped like an upside-down mushroom and made of a wooden frame, poured concrete and steel rebar to provide strength, with only a small portion of the 'stem' visible once construction is complete
- ✦ After construction, the subsoil and topsoil will be returned and the area can be farmed to within a few metres of the turbine.



### WIND TURBINE ASSEMBLY AND INSTALLATION

- ✦ Once turbine foundations are complete and the concrete has set, the turbines will be constructed, usually in five lifts (three for the towers, one for the nacelle - which houses the main components of the wind turbine such as the rotor shaft, control panel, generator, etc. - and one for the rotor with the blades already mounted).

### CONSTRUCTION OF ELECTRICAL COLLECTOR SYSTEM (INCLUDING PAD MOUNTED TRANSFORMERS AND UNDERGROUND COLLECTION LINES)

- ✦ Pad Mounted Transformers are approximately 2.2 m by 2.5 m in size and are used to “step-up” the electricity generated by the turbine to 34.5 kV.

# BORNISH WIND ENERGY CENTRE

## Construction Plan Reports Summary

- First, soil in the area is removed and stored for later use.
  - Once the grounding equipment, concrete pad and transformer are in place, the electrical connectors are installed.
- ✦ Collection lines are electrical cables that are used to connect each turbine to the Bornish Substation.
- First, soil in the area is removed and stored for later use.
  - The collection lines are generally buried 0.9 m below ground.
  - Some collection lines will be tunnelled below woodlots or watercourses to avoid effects to natural areas.
  - In these cases, entrance and exit points will be created on each side of the natural area to be crossed, the tunnel between the two points will be excavated, and the electrical cable will be fed from the entrance to the exit point.

### CONSTRUCTION OF TRANSFORMER SUBSTATION

- ✦ The transformer substation with a total footprint of 2-3 ha is used to “step-up” electricity from the collection lines (34.5 kV) to 115 kV for transmission to the Parkhill Substation, where the voltage will be stepped up to 500 kV.
- First, soil in the area is removed, stored for later use and replaced with a layer of gravel, if needed.
  - A containment system will be constructed around the transformer to prevent soil contamination in the event there is an oil leak.

### CONSTRUCTION OF ELECTRICAL TRANSMISSION LINE

- ✦ The 115 kV electrical transmission line will connect the electricity generated by the wind Project from the Bornish Substation to the proposed Parkhill Substation where it will be fed into the Provincial electricity grid.
- ✦ The transmission line will be mounted on existing poles or on new poles, to be determined during the engineering and design phase and with Hydro One Networks Inc.
- ✦ New poles will be constructed of wood, concrete or steel and will be 18 – 30 m tall with the poles buried 1 to 2 m below ground.
- ✦ Once poles are in place, the cables will be strung between the poles.



# BORNISH WIND ENERGY CENTRE

## Construction Plan Reports Summary

### CONSTRUCTION OF OPERATION AND MAINTENANCE BUILDING

- ✦ An operations building will be built for the Project or an existing building will be purchased/leased. The operations building is approximately 30 m by 15 m in size and is used to monitor the daily operations of the wind energy centre.
- ✦ Drinking water will be supplied by a well or through the municipal water system and if required, a septic bed will be constructed for the disposal of sewage.

### CONSTRUCTION OF PERMANENT METEOROLOGICAL TOWER(S)

- ✦ The meteorological tower(s) are approximately 80 m high and used to monitor wind conditions at the Project site.
- ✦ They will either be monopole (a single pole) or lattice structure (a framework tower) and will be secured with three guy wires.

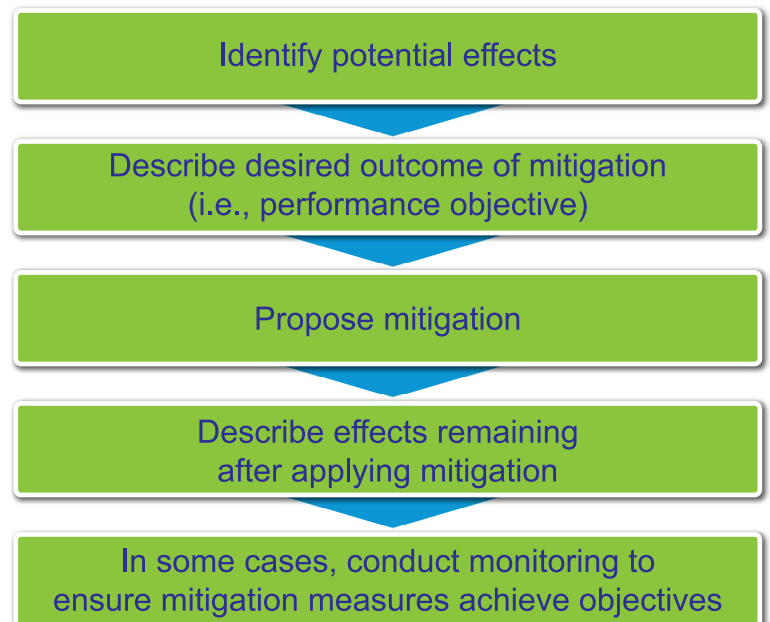
### CLEAN UP AND SITE RECLAMATION

- ✦ Site clean-up will occur throughout the construction phase and site reclamation will occur after construction has been completed.
- ✦ Materials will be recycled as much as possible and waste will be removed from the site and disposed of at an appropriate facility.
- ✦ All disturbed areas will be restored with the stockpiled soil and reseeded, as appropriate.

## Effects Assessment

The following flow chart describes the effects assessment process from the first stage of identifying potential effects through to describing residual effects (i.e. effects remaining after mitigation measures are applied) and conducting monitoring.

This section provides a summary of some of the potential effects, mitigation measures and monitoring commitments from the effects assessment. For the full effects assessment, please refer to the Construction Plan Report.



# BORNISH WIND ENERGY CENTRE

## Construction Plan Reports Summary

### CULTURAL HERITAGE

Construction activities could disturb archaeological resources identified through the archaeological Assessments; several sites remain for Stage 3 investigation to determine the potential for impacts. To avoid or lessen these effects, protective fencing will be installed around the archaeological site boundary or further archaeological studies will be conducted.

### NATURAL HERITAGE RESOURCES (SUCH AS WETLANDS AND FORESTS)

Although Project components were sited to avoid or leave a separation distance between significant natural heritage features (i.e. significant wetlands and woodlands, etc), some vegetation removal will be required.

Vegetation removal could disturb wildlife and affect wildlife movement in the area. To avoid or lessen these effects, all temporary construction areas will be reseeded, as appropriate, and construction will be avoided, to the extent possible, when sensitive wildlife are breeding to reduce the potential for disturbance.



### SURFACE WATER AND GROUNDWATER

Construction activities close to streams could cause erosion and result in soil entering the watercourses. An erosion and sediment control plan will be developed and implemented to control potential erosion and protect the watercourses. In addition, areas where vegetation was removed will be replanted.

### EMISSIONS TO AIR

The increase of heavy truck traffic on local roads during construction could create dust and increase emissions to air. Road surfaces will be sprayed with water or an environmentally friendly dust suppressant to reduce the amount of dust created.

### NOISE

Construction activities will increase noise levels in the Project area. All construction equipment will be maintained in good working condition and construction activities will abide by local by-laws regarding hours of operation.

### LOCAL INTERESTS, LAND USE AND INFRASTRUCTURE

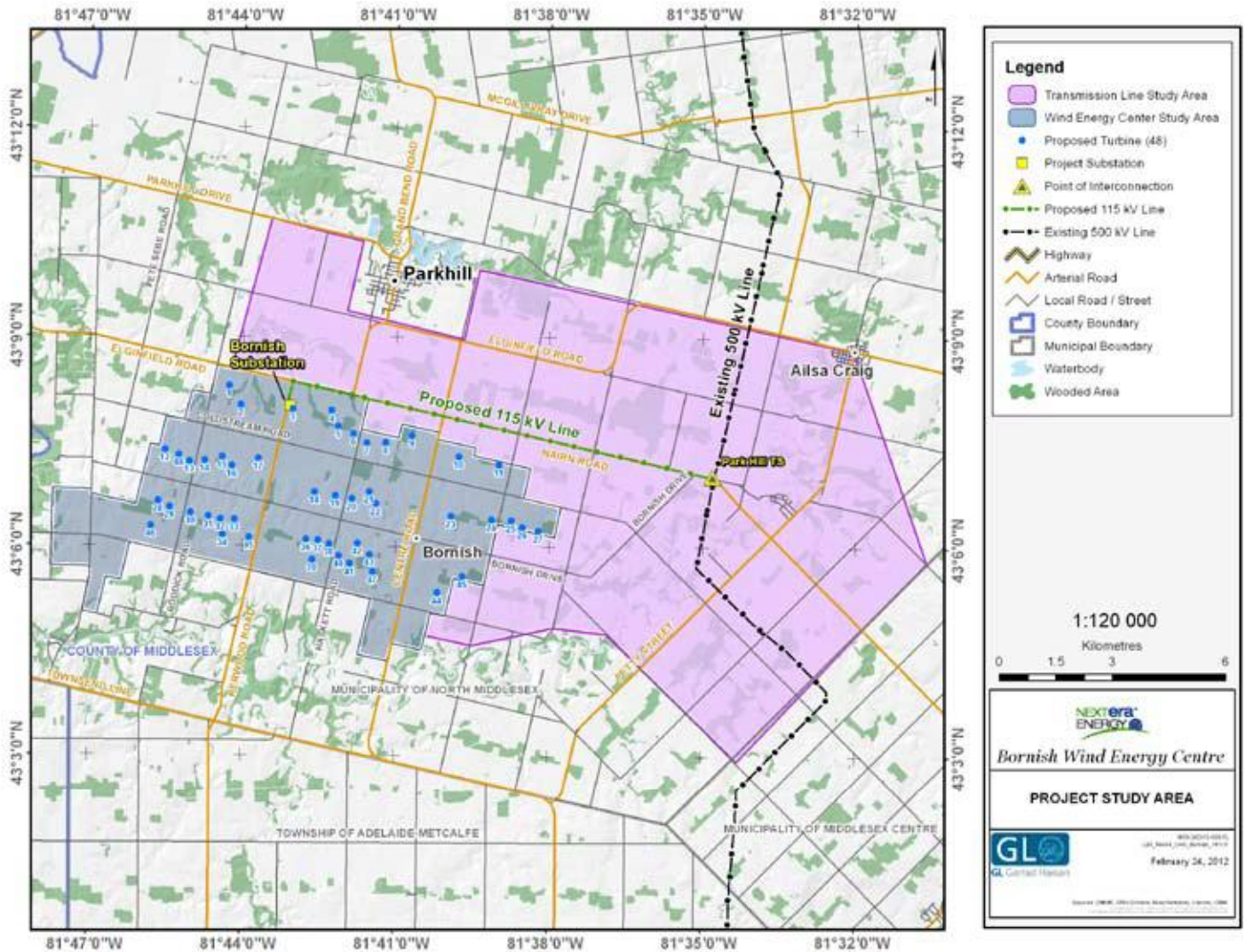
The increase in construction traffic could cause traffic congestion or damage to local roads. A Traffic Management Plan will be prepared prior to beginning construction activities. Finally, any damage to local infrastructure caused by construction activities will be repaired to original (or better) condition.

***The overall conclusion of the Construction Plan Report is that this Project can be constructed and installed without any remaining effects that could harm the environment.***



# BORNISH WIND ENERGY CENTRE

## Construction Plan Report Summary



### Have A Question?

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# BORNISH WIND ENERGY CENTRE

## Design and Operations Report Summary

APRIL 2012

Bornish Wind LP is proposing to develop the Bornish Wind Energy Centre (the "Project"). Bornish Wind LP is a wholly-owned subsidiary of NextEra Energy Canada ULC. The parent company of NextEra Energy Canada ULC is NextEra Energy Resources, LLC, with a current portfolio of nearly 8,500 operating wind turbines across North America. The Project is located in the Municipality of North Middlesex and will consist of 45, 1.62 MW turbines with a total nameplate capacity of 72.9 MW, though 48 turbine locations will be permitted.

The purpose of the Design and Operations Report is to provide specific details on how the Project is designed, the equipment used and operated and how emergencies and ongoing communication will be managed. The report also presents mitigation measures/monitoring commitments and residual effects, if any. Residual effects are "left over" effects once mitigation measures have been applied.



# BORNISH WIND ENERGY CENTRE

## Design and Operations Report Summary

### SITE PLAN

This Site Plan, shown on Figure on back page, was designed to meet Provincial “setback distances” outlined in the following table.

### ONTARIO REGULATION 359/09 SETBACK DISTANCES

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

### FACILITY DESIGN PLAN

#### WIND TURBINES

- ✦ Forty-five 1.62 megawatt (MW) GE model wind turbines, 80 m tall tower with 50 m long blades, though 48 turbine locations will be permitted.

#### ACCESS ROADS

- ✦ 11 m wide during construction. Provides access to properties for equipment during construction and for maintenance during operations.

#### COLLECTION LINES

- ✦ 34.5 kilovolt (kV) electrical collection lines to be buried on private property next to access roads, where possible. Connects electricity generated by each turbine to the Bornish Substation.



# BORNISH WIND ENERGY CENTRE

## Design and Operations Report Summary

### ELECTRICAL TRANSMISSION

- ✦ Energy generated by the Project will be collected via 34.5 kV underground cabling directed to the Bornish Substation that will step-up the voltage from 34.5 kV to 115 kV. A project-owned 115 kV transmission line will then link to a switchyard and from there will connect to the Parkhill Substation where the voltage will be stepped up to 500 kV.

### TRANSFORMER SUBSTATION

- ✦ A total footprint of approximately 2-3 ha in size, the Bornish Substation increases voltage of electricity from collection lines (34.5 kV) to 115 kV for transmission to the Parkhill Substation.

### OPERATIONS AND MAINTENANCE BUILDING

- ✦ Approximately 30 m by 15 m in size, will be constructed on privately held lands or an existing building will be purchased/leased. To be used to monitor day-to-day operations of the wind energy centre.

### PERMANENT METEOROLOGICAL TOWER(S)

- ✦ Typically 80 m in height, up to two MET towers are proposed to be constructed. MET towers are used to monitor weather conditions at the site.

## FACILITY OPERATION PLAN

### WIND TURBINE OPERATION

- ✦ 5-10 workers will carry out day to day activities associated with turbine operation.
- ✦ A communication line connects each turbine to the Operations Centre, which closely monitors and can control the operation of each turbine.



# BORNISH WIND ENERGY CENTRE

## Design and Operations Report Summary

### MAINTENANCE

- Approximately every 6 months, routine maintenance will be carried out by 2-3 workers over a full day at each turbine.
- The substations will receive periodic protective relay maintenance and the collection lines will receive periodic assessments of their condition.
- Unplanned maintenance can include failure of small components and may be addressed by a technician over several hours.
- Events involving the replacement of major components such as gearboxes are not typical; however, this could require the use of large equipment.

### WASTE MANAGEMENT

- Waste generated during operations will be removed from the operations and maintenance building by a licensed operator and disposed of at an approved facility. Recycling services will be used to the extent available.

### EMERGENCY RESPONSE AND COMMUNICATION PLAN

The Emergency Response and Communication Plan, which will be filed with the Ministry of the Environment, the municipalities of North Middlesex and Middlesex County, include details on:

- Emergency Action Plans for outlining steps to be taken in the event of an on-site emergency;
- Ongoing Communication to update the community throughout the construction and operations phase; and,
- Complaints Resolution Process for dealing with any questions or concerns.

