

# GOSHEN WIND ENERGY CENTRE

## Construction Plan Report Summary

SEPTEMBER 2012

Goshen Wind, Inc., a wholly owned subsidiary of NextEra Energy Canada, ULC (NextEra) is proposing to construct a wind energy Project in Bluewater and South Huron, Huron County, Ontario. The project will be referred to as the Goshen Wind Energy Centre (the "Project") and will be located on private lands in the vicinity of the shoreline of Lake Huron. The wind turbine technology proposed for the Project is the GE 1.6-100 Wind Turbine and one GE 1.56-100 Wind Turbine. With a total nameplate capacity of 102 MW, the Project is categorized as a Class 4 facility. Although NextEra is seeking a Renewable Energy Approval (REA) for up to 72 wind turbines, only 63 will be constructed for the Project.

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.

The Construction Plan Report was prepared in accordance with the requirements outlined in Ontario Regulation 359/09, the regulation governing renewable energy projects in Ontario.



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Corresponding section references are provided below to assist with reviewing the associated reports.

### DESCRIPTION OF CONSTRUCTION AND INSTALLATION ACTIVITIES - SECTION 2

The following table presents the anticipated construction schedule and approximate order of construction activities for the proposed Project; some construction activities will overlap. The construction phase of the Project is anticipated to begin in May 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 and Breaker Switch Station					●	●	●
Construction of Operations Building						●	●
Land clean up and Reclamation		●	●	●	●	●	●
Turbine Commissioning							●

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### CONSTRUCTION ACTIVITIES - SECTION 2.2

#### 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.



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### 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 and 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 its 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.
  - First, soil in the area is removed and stored for later use.



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- 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 transformer substation. First, soil in the area is removed and stored for later use.
  - Collection lines will be tunnelled below woodlots or watercourses to avoid effects to natural areas.
  - In these cases, entrance/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 AND BREAKER SWITCH STATION

- ✦ The transformer substation will “step up” the electricity collected from the 34.5 kV underground collection lines to 115 kV for transmission to a breaker switch station. The breaker switch station is the connection point with the existing Hydro One 115 kV transmission line.
  - First, soil in the area is removed, stored for later use and replaced with a layer of gravel, if needed.
  - Stripped topsoil and subsoil will be placed in the temporary storage facility area and topsoil stripped from the substation area will be distributed on other Project properties

### CONSTRUCTION OF ELECTRICAL TRANSMISSION LINE

- ✦ A 115 kV electrical transmission line from the step-up transformer substation to the connection point with the Provincial electricity grid is proposed to be located on private property and within existing road right-of-ways.
- ✦ New poles will be made of wood, concrete or steel and will be 18 – 30 m tall with the poles buried 2 to 3 m below ground.
- ✦ The poles are typically “dressed” (made ready to accept conductors) on the ground prior to installation.

### CONSTRUCTION OF OPERATION AND MAINTENANCE BUILDING

- ✦ An operations building will be built for the Project or an existing building will be purchased or leased. The operations building will be approximately 30 m by 15 m in size and is used to monitor the daily operations of the wind energy centre.



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- ✦ 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 TOWERS

- ✦ Three meteorological towers are proposed for the project and are approximately 80 m high and used to monitor wind conditions at the Project site.
- ✦ The towers will be erected using winches and secured with guy wires tied off to anchors or a monopole foundation.

### 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.

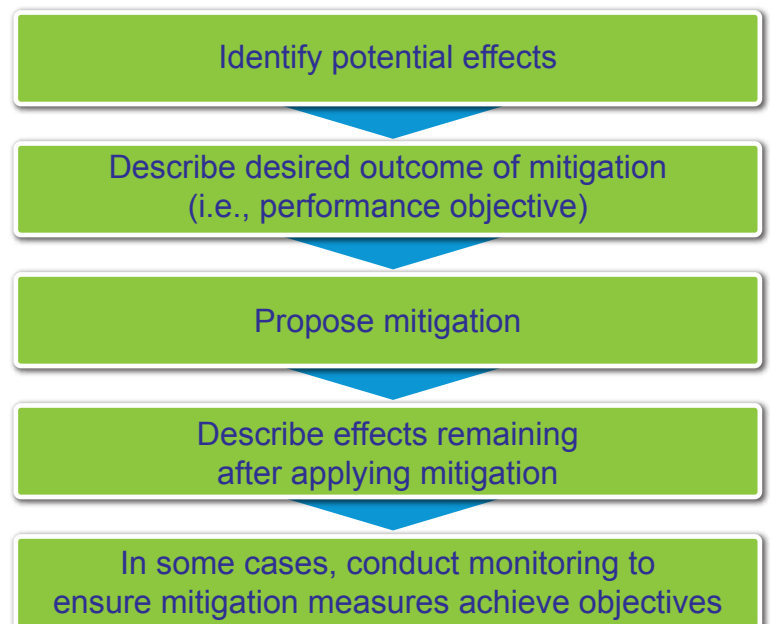
## EFFECTS ASSESSMENT - SECTION 3

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.

### CULTURAL HERITAGE

Construction activities could disturb 4 archaeological resources identified through the archaeological assessments. To avoid or lessen these effects, protective fencing will be installed around the archaeological site boundary or further archaeological studies will be conducted.



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### 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.

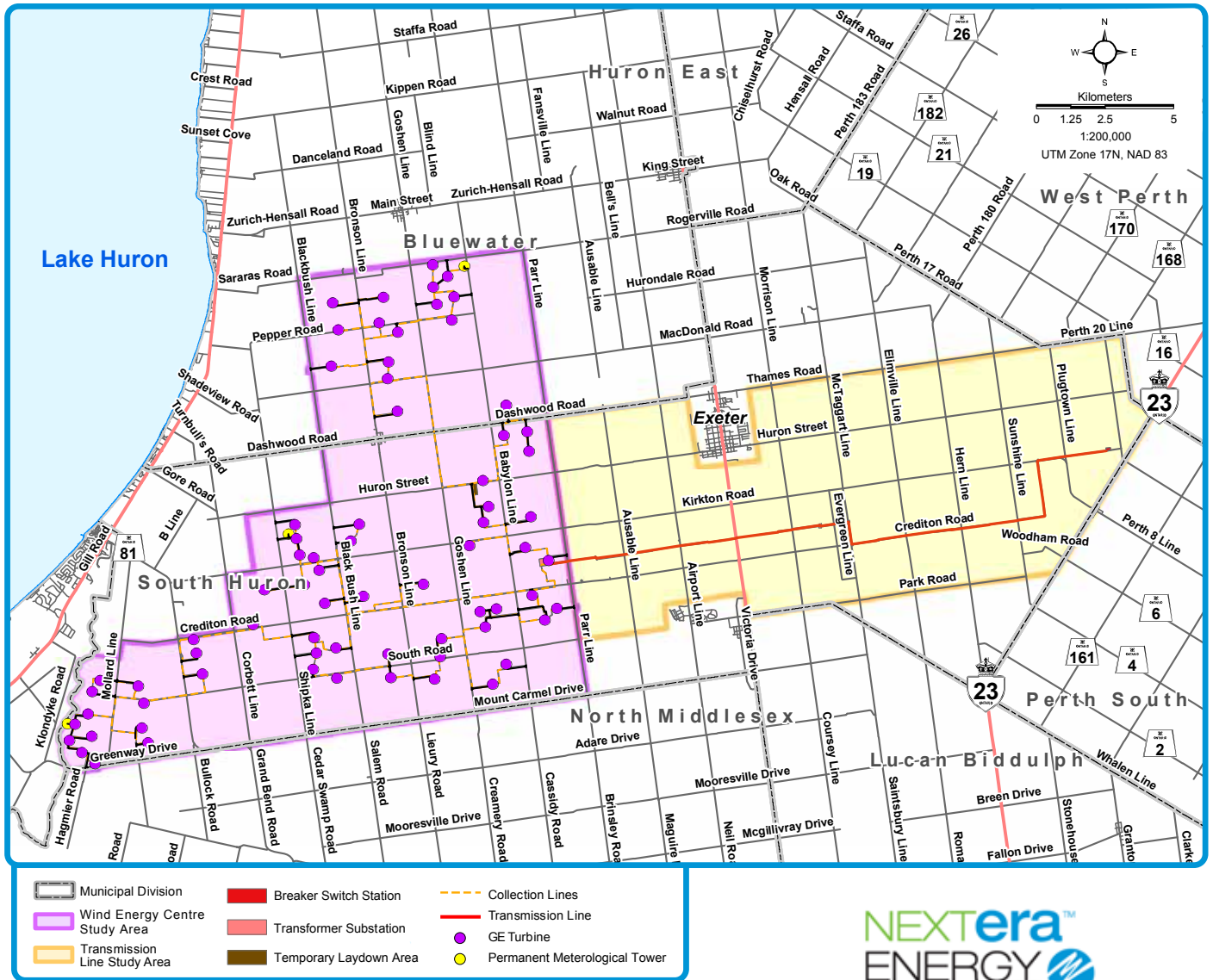
### LOCAL INTERESTS, LAND USE AND INFRASTRUCTURE

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.***

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### 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:

#### Project Proponent

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