

September 2011



NORTHLAND POWER

McLean's Mountain Wind Farm

Wind Turbine Specifications Report - Final



Submitted by:



**McLean's Mountain Wind Farm -
Renewable Energy Approval (REA)
Application Submission**

FINAL SUBMISSION

Wind Turbine Specification Report

September 2011

**McLean's Mountain Wind Limited
Partnership**

09-1983

Submitted by

**Dillon Consulting
Limited**

Executive Summary

Northland Power Inc. (NPI) and Mnidoo Mnising Power (MMP) together form McLean's Mountain Wind Limited Partnership (MMWLP). MMWLP proposes to develop the McLean's Mountain Wind Farm (MMWF), located south of the community of Little Current, in the Municipality of Northeastern Manitoulin and the Islands (NEMI); geographic Township of Howland, and the geographic Township of Bidwell in the District of Manitoulin, Ontario and falls within the traditional lands of the Anishnabee of Mnidoo Mnising. The selection of the project's location was based primarily on the wind resource, access to the provincial transmission system, environmental constraints and local landowner support.

The proposed wind farm (the "project") will consist of 24, 2.5 MW wind turbines with a nameplate capacity of 60 MW. The electricity generated from the wind turbines will be collected through a network of collection grid lines to the on-site transformer. The transformer will step-up the voltage to 115 kV. A 10.3 kilometre transmission line will be installed to connect the project to the Provincial Grid on Goat Island. A section of the transmission line will involve a submarine cable to cross the North Channel to access Goat Island. Each wind turbine will be accessed by a short access road.

The proposed project will require approval under Ontario Regulation 359/09 – Renewable Energy Approval (REA) under the *Green Energy Act*. Based on the REA Regulations, this project is a "Class 4" wind facility. This *Wind Turbine Specification Report* is one component of the REA Application for the Project, and has been written in accordance with Ontario Regulation 359/09, the Ontario Ministry of Natural Resources' (MNR) Approval and Permitting Requirements Document for Renewable Energy Projects (September 2009).

This report outlines the specifications of the wind turbines, including the make, model, nameplate capacity, hub height, rotational speeds and acoustic emissions data, including the sound power and frequency spectrum; in terms of octave-band sound power levels, as well as the measurement uncertainty value and tonality.

Table of Contents

1	INTRODUCTION	1
2	THE PROPONENT	2
3	PROJECT LOCATION	3
4	WIND TURBINE SPECIFICATIONS	4
	4.1 Wind Turbine Locations	5

List of Figures

Figure 3-1: Project Location

List of Tables

Table 1-1:	Adherence to O.Reg 359/09 Wind Turbine Specifications Report
Table 4-1:	Turbine Description – General Electric 2.5xl
Table 4-2:	Turbine Locations

List of Appendices

Appendix A:	GE Energy Commercial Documentation Wind Turbine Generator Systems GE 2.5xl – Technical Description and Data
Appendix B:	GE Energy Commercial Documentation Wind Turbine Generator Systems GE 2.5xl – Product Acoustic Specification

1. INTRODUCTION

Northland Power Inc. (NPI) and Mnidoo Mnising Power (MMP), propose to develop the McLean's Mountain Wind Farm (MMWF). The proposed wind farm will consist of 24, 2.5 megawatt (MW) wind turbines that will generate 60 MW of electricity. The proposed project will require approval under Ontario Regulation 359/09 – Renewable Energy Approval (REA) under the *Green Energy Act*. Based on the REA Regulations this project is a “Class 4” wind facility. This *Construction Plan Report* is written in accordance with Ontario Regulation 359/09.

The McLean's Mountain Wind Farm Environmental Study Report (ESR) document was released in July 2009 for a 30-day public review, as part of the former Environmental Assessment process. The ESR document is consistent with the former Environmental Screening provisions of Ontario Regulation 116/01 for a Category B project and with the requirements of the *Canadian Environmental Assessment Act*. The ESR document was developed to assist in the determination of potential environmental effects, including both the social and natural environment, which could result from the proposed project. The ESR document contains additional information that is not required under the REA legislation and can provide further reference as required.

Subsequent to changes in the relevant legislation, the project now requires approval under Ontario Regulation 359/09 – Renewable Energy Approval (REA) under the *Green Energy Act*. The REA replaces approvals formerly required under the Environmental Assessment Act, Planning Act, and Environmental Protection Act. The project is being developed under the *Green Energy Act* (GEA) Feed-In-Tariff (FIT) program.

This *Wind Turbine Specifications Report* has been prepared to fulfill the requirements of Item 13 in Table 1 of the Ontario Regulation 359/09, Renewable Energy Approvals as per the table below (**Table 1-1**).

Table 1-1: Adherence to O.Reg 359/09 Wind Turbine Specifications Report

Requirements	Section Reference
Provide specifications of each wind turbine, including make, model, name plate capacity, hub height above grade, rotational speeds and acoustic emissions data, including the sound power level and frequency spectrum, in terms of octave-band sound power levels, measurement uncertainty value and tonality.	Section 4 Appendix B

In addition to this report the REA submission package includes:

- Project Description Report;
- Construction Plan Report;
- Design and Operations Report;
- Noise Study Report;

- Natural Heritage Assessment Reports (Records Review, Site Investigation, Evaluation of Significance, and Environmental Impact Statement (EIS));
- Water Bodies Assessment Summary Report;
- Archaeological Assessment Reports (Stage 1 and 2) ;
- Cultural Heritage Self-Assessment Report;
- Decommissioning Report;
- Consultation Report;
- Property Line Setback Report;
- Environmental Management and Protection Plan (EMPP);
- Post-Construction Monitoring Plan (PCMP); and
- Supporting Documents.

2. THE PROPONENT

Northland Power Inc. (NPI) is a developer, owner and operator of power generation facilities and is the proponent of the “McLean’s Mountain Wind Farm Project”. In February 2011, Mnidoo Mnising Power (MMP), a company formed by the United Chiefs and Councils of Mnidoo Mnising First Nations (UCCMM), entered into a 50/50 partnership with Northland Power Inc. to form the McLean’s Mountain Wind Limited Partnership to develop the McLean’s Mountain 60 MW Wind Farm project.

NPI’s development activities include building, owning and operating wind energy facilities. In the course of developing its wind energy projects, NPI satisfies various environmental approval requirements and obtains regulatory approvals that vary depending on the jurisdiction, project capacity and site location.

The MMP company was formed to lead renewable energy projects on Manitoulin Island in order to protect First Nations’ rights, heritage and ensure the future for First Nations’ youth.

MMWLP is the primary contact for this project. The MMWLP contact information is as follows:

Full Name of Company:	<u><i>McLean’s Mountain Wind Limited Partnership</i></u>
Address:	<u><i>30 St. Clair Avenue West, 17th Floor</i></u> <u><i>Toronto, Ontario M4V 3A1</i></u> <u><i>Canada</i></u>
Telephone:	<u><i>Local office: (705)-368-0303</i></u> <u><i>mobile: (705)-271-5358</i></u>
Prime Contact:	<u><i>Rick Martin, Project Manager</i></u>
Email:	<u><i>rickmartin@northlandpower.ca</i></u>

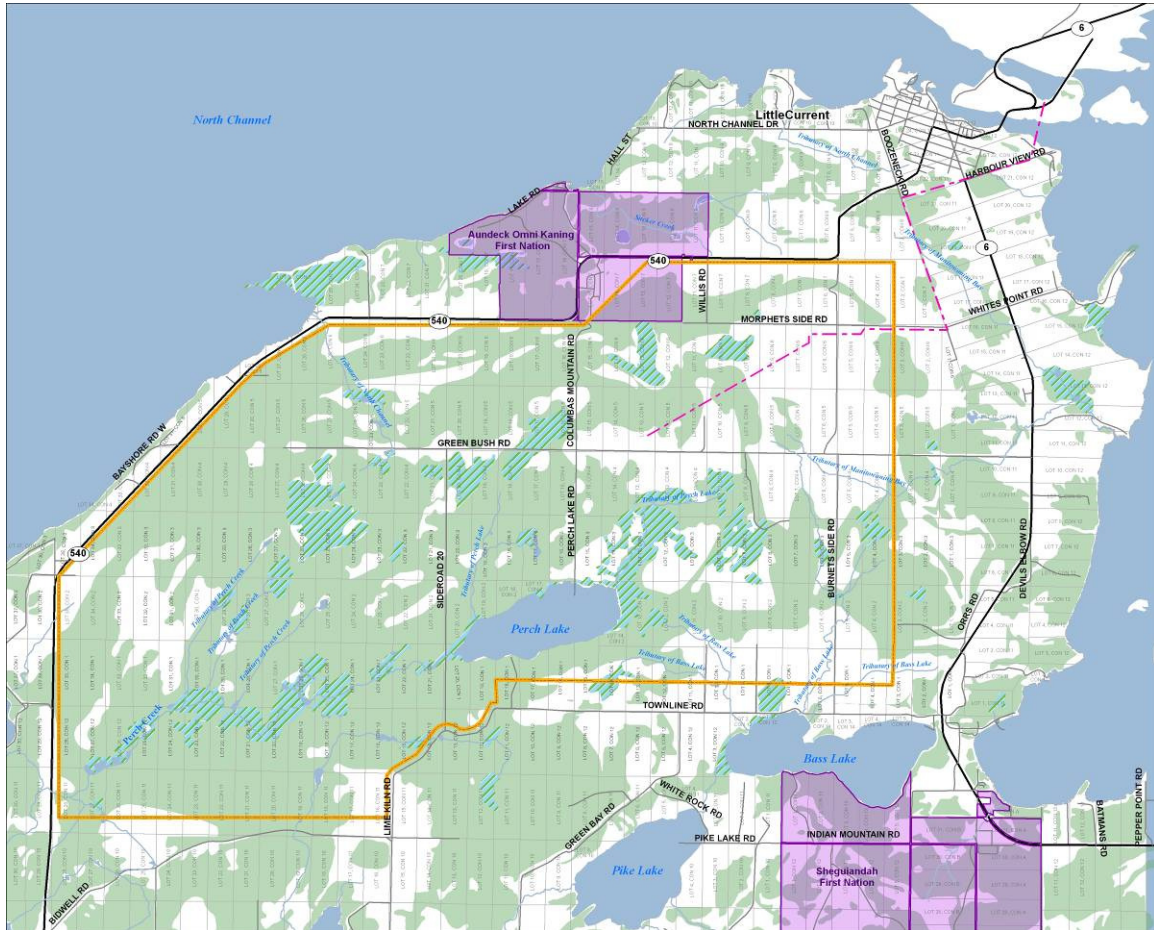
Dillon Consulting Limited is the prime consultant for the preparation of this Report. The Dillon contact information is as follows:

Full Name of Company:	<u><i>Dillon Consulting Limited</i></u>
Address:	<u><i>235 Yorkland Boulevard, Suite 800,</i></u> <u><i>Toronto, Ontario M2J 4Y8</i></u>
Telephone:	<u><i>Office: (416)-229-4646 ext 2335</i></u>
Prime Contact:	<u><i>Don McKinnon, REA Project Manager</i></u>
Email:	<u><i>dpmckinnon@dillon.ca</i></u>

3. PROJECT LOCATION

The project study area is located entirely in the Municipality of Northeastern Manitoulin and the Islands; geographic Township of Howland and the geographic Township of Bidwell, in the District of Manitoulin and falls within the traditional lands of the Anishnabee of Mnidoo Mnising. The project location is approximately 5 kilometers from the Town of Little Current. Within this broader project study area is the project site area, where the wind turbines and associated wind farm infrastructure will be located (excluding a portion of the transmission line and the connection yard at the Hydro One grid, which is located on the adjacent Goat Island). **Figure 3-1** presents the location of the project area.

Figure 3-1: Project Area



4. WIND TURBINE SPECIFICATIONS

The project will consist of 24 General Electric 2.5 MW wind turbine generators for a total nameplate capacity of 60 MW. The following table provides a description of the GE 2.5 xl wind turbine that will be used for the Project. Additional turbine specifications and acoustic emissions data is provided in **Appendix A** as supplied by General Electric. Additional acoustic information can also be found in the *Design and Operations Report*.

Table 4-1: Turbine Description – General Electric 2.5xl	
<i>Operating Data</i>	<i>Specification</i>
General	
Rated capacity (kW)	2500
Cut-in wind speed (m/s)	3.5
Cut-out wind speed	25

Table 4-1: Turbine Description – General Electric 2.5xl

<i>Operating Data</i>	<i>Specification</i>
Number of rotor blades	3
Rotor diameter (m)	103
Swept Area (m ²)	8328
Rotational Speed (rpm)	5-14 (variable)
Tower	
Hub height above grade (m)	98.3
Tip height (m)	193.8

4.1 Wind Turbine Locations

For the purposes of all the environmental studies, twenty-nine (29) potential turbine sites have been identified and examined. Approval is only being sought for the construction of 24 turbines. The five additional turbine sites will only be implemented, should any of the preferred 24 sites become unsuitable for development.

The locations of all 29 proposed wind turbine sites and the substation are listed below in **Table 4-2**. The MOE requires a setback distance of at least hub height from all non-participating project line boundaries. There are three turbines that do not meet this requirement. A description of the distances to non-participating lots lines, potential for adverse effects and a description of preventative measures can be found in the *Property Line Setback Report*.

Table 4-2: Turbine Locations

<i>Turbine ID</i>	<i>UTM Y</i>	<i>UTM X</i>
T5	5088867	425967
T6	5088648	425374
T9	5088349	426960
T10	5088273	426243
T11	5087692	423155
T12	5087875	424685
T13	5087836	425578
T14	5087874	424005
T15	5087605	426514
T16	5085277	423976
T17	5086508	421160
T18	5086314	423020
T19	5086354	426002
T20	5086379	425263
T21	5086170	420869
T23	5085958	423091
T25	5084615	415729
T28	5084943	424742
T29	5084978	423719

Table 4-2: Turbine Locations

<i>Turbine ID</i>	<i>UTM Y</i>	<i>UTM X</i>
T30	5084627	424211
T31 (extra site)	5082550	416174
T34 (extra site)	5084235	423970
T35	5083842	415668
T36	5083552	416181
T38	5083197	415679
T39 (extra site)	5082519	417095
T40 (extra site)	5082915	416441
T42	5082675	415354
T43 (extra site)	5082179	416653
Substation	5087363	423616

APPENDIX A
GE Energy Commercial Documentation
Wind Turbine Generator Systems
GE 2.5 xl – Technical Description Data

Secured Document from General Electric
– Available for download at:

<http://mcleansmountain.northlandpower.ca>

Under the 'Reports' Link

APPENDIX B
GE Energy Commercial Documentation
Wind Turbine Generator Systems
GE 2.5 xl – Product Acoustic Specification

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