NORTHLAND POWER

June 23, 2021

Ministry of the Environment,
Conservation and Parks
Client Services and Permissions Branch
135 St. Clair Ave. West, 1st Floor
Toronto, Ontario, M4V 1P5

Submitted by e-mail

SUBJECT: Application for Amendment to Existing REA 5186-9HBJXR
Grand Bend Wind Farm - Request for Trial to Modify the Blades on Two Wind Turbines with Noise Reduction Add-Ons (F-Type DinoTails, Vortex Generators) and if Successful, Implement the Change at all Turbines

Please find attached, an application to amend the existing Renewable Energy Approval (REA) 5186-9HBJXR issued June 26, 2014, and as amended March 24 2015 and April 12 2017, for the Grand Bend Wind Farm (GBWF).

Grand Bend Wind Limited Partnership (GBWLP), by its general partners, Grand Bend Wind GP Inc. and with Northland Power Inc. (Northland) as agent, has constructed a 100 MW wind power facility located near the community of Grand Bend, Ontario. This project is classified as a Class 4 Wind facility and was approved by the Ministry of Environment, Conservation and Parks (MECP) under Ontario Regulation 359/09 of the Ontario Environmental Protection Act. The project consists of forty 2.483 MW Siemens SWT-3.0-113 wind turbine generators located Huron County, specifically the lower-tier municipalities of Bluewater and Huron South. Portions of a transmission line also traverse the municipality of Huron East and municipality of West Perth County.

Trial Request and Rationale

Northland proposes to modify noise reduction add-ons (DinoTails and Vortex Generators) installed on the wind turbine blades of two of the facility's turbines, on a trial basis. This modification will reduce the sound levels from the turbines, and associated adjustments to the pitch angles of the turbine blades may increase power output slightly. The wind turbines currently under-produce electricity versus initial expectations. It is hoped that the new blade add-ons will reduce noise levels, and the blade pitch adjustments will recapture some of the missing production while maintaining compliance with the project's approved noise limits.

GBWF uses forty Siemens Gamesa Renewable Energy (SGRE) SWT-3.0-113 wind turbines, which are derated to 2.483 MW to comply with noise requirements and to deliver the 100 MW output contracted under the FIT contract with the IESO. Currently the wind turbines are under-performing slightly, particularly at higher wind speeds. The SWT-3.0-113 wind turbine blades are originally designed to include two add-on devices that mitigate noise generated by the blades while they operate. The two add-on devices are: SGRE D-type Dinotails and Vortex Generators. This change request is to allow modification to these add-ons by relocating the D-type Dinotails to the mid-span area of the turbine blade and adding new F-type Dinotails and additional Vortex Generators at the end section of the turbine blade.

Implementing the changes to the turbine blade's noise reduction add-ons, may assist in recapturing some of the Facility's missing electricity generation, as follows: The wind turbines automatically adjust the pitch of the turbine blades as the wind speed changes. The blade pitch is adjusted to capture as much wind as possible, while maintaining proper airflow across the blade and not causing aerodynamic "stalls". How much wind is captured translates into blade rotation and electricity generation. With the proposed turbine blade noise reduction add-ons to including both D-type and F-type Dinotails and additional Vortex Generators, there is no change to the turbine's performance when the winds are under 7.5 m/s. But when the winds are 7.5 m/s or higher, SGRE predicts a noise reduction of 1 to 1.5 dBA and the

pitch settings can be altered to try and recapture some of the missing production with the current pitch settings. During these higher wind regimes, the blade rpm may increase between 0.25 to 0.5 rpm above current, which is an increase of 2 – 4 %

While SGRE assures that the proposed blade modifications will achieve the predicted noise reduction, they are unable to provide sound emission data specifically for SWT-3.0-113 turbine operating at the 2.483 MW derate. Hence, Northland is proposing to conduct a trial on two of the facility's 40 turbines, where turbine noise emission data collected before the modifications is compared with data collected after the modifications are completed. Northland agrees to conduct pre-modification and post-modification noise E-emission audits, in the down-wind and cross-wind locations, for both wind turbines.

Northland proposes to implement the blade modification trial at turbines T19 and T34. A "Modifications Document" is appended to this application and this includes a Site Plan of the GBWF and additional information regarding the SGRE DinoTails and noise reduction expectations.

Full Wind Farm Implementation

Should the two turbine trial be successful, as judged by reducing (or at least maintaining) the noise impacts from the turbines and recapturing some of the missing electricity generation currently being experienced, then the blade modifications could be implemented at all turbines at GBWF.

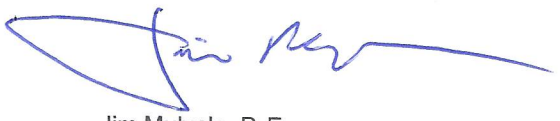
Northland would advise the MECP of our intention to proceed with the implementation at the other 38 turbines, before proceeding.

Note that the entire implementation of this change request is performed up-tower, by trained technicians on the blades themselves. Absolutely no change is made to the footprint of the Facility, no digging/excavation or any other invasive work is required. Requests have been submitted to the MNRF and the Ministry of Heritage, Sport, Tourism and Culture Industries to obtain "no comment or no further work" advice letters from them.

Timing is critical for this amendment review, if the noise audit work is to be completed in 2021. At this point, we are seeking approval for the two turbine trial portion as quickly as possible, and the full site implementation option can be considered over a longer period of time.

Please do not hesitate to contact me with any questions or concerns, or for discussion on how we can support the MECP with the review.

Yours sincerely,



Jim Mulvale, P. Eng.
Sr. Director, Environment
Northland Power Inc., as agent for GBWF
Jim.mulvale@northlandpower.com
416 662 1437

Ontario Ministry of the Environment and Climate Change

Renewable Energy Approval Application

For Office Use Only			
Reference Number	Payment Received	Date (yyyy/mm/dd)	Initials
	$		

Application Summary

Applicant Name (Legal name of individual or organization as evidenced by legal documents)

Grand Bend Wind Limited Partnership by its general partner Grand Bend Wind GP Inc.

Project Name (Project identifier to be used as a reference in correspondence)

Grand Bend Wind Farm

Project Description Summary (This summary should reflect the description in the documents upon which consultation has been completed and if it does not, the difference should be highlighted)

Grand Bend Wind Limited Partnership (GBWLP), by its general partners, Grand Bend Wind GP Inc. and with Northland Power Inc. (Northland) as agent, has constructed a 100 MW wind power facility located near the community of Grand Bend, Ontario. This project is classified as a Class 4 Wind facility and was approved by the Ministry of Environment, Conservation and Parks (MECP) under Ontario Regulation 359/09 of the Ontario Environmental Protection Act. This approval, Renewable Energy Approval (REA) number 5186-9HBJXR, was amended on March 24, 2015 and again April 12, 2017. The project consists of forty 2.483 MW Siemens SWT-3.0-113 wind turbine generators located Huron County, specifically the lower-tier municipalities of Bluewater and Huron South. Portions of a transmission line also traverse the municipality of Huron East and municipality of West Perth County. Northland is requesting an amendment to allow for a trial of modified noise-reduction add-ons installed on the existing blades of two of facility's wind turbines. If successful, the change may be implemented at all turbines.

Supplemental Application Information (Provide any other information that might be relevant to your application)

Note: This form has been save-enabled; you can save a copy of this form that includes any information you have entered.

Additional instructions and information on how to complete the application form can be found in the accompanying "Guide for Completing the Renewable Energy Approval Application".

Section 1 – Applicant Information

1.1 – Applicant Information (Owner of works/facility)

Applicant Name (Legal name of individual or organization as evidenced by legal documents)
Grand Bend Wind Limited Partnership by its general partner Grand Bend Wind GP Inc.

Business Identification Number
150890390

Business Name (The name under which the entity is operating or trading, also referred to as trade name)
Grand Bend Wind Limited Partnership

☐ Same as Applicant Name

Applicant Type

☐ Corporation ☐ Federal Government ☐ Individual ☐ Municipal Government
☑ Partnership ☐ Provincial Government ☐ Sole Proprietor
☐ Other (describe):

North American Industry Classification System (NAICS) Code
221119

Business Activity Description (A description of the business endeavour, this may include products sold, services provided or machinery/equipment used, etc.)
Operates a industrial wind power facility.

1.2 – Applicant Physical Address

Civic Address

Unit Number	Street Number	Street Name (Include type and direction)
	30	St. Clair Ave W., 12th Floor

City/Town	Province	Postal Code
Toronto	ON – Ontario	M4V 3A1

Survey Address (Not required if the Civic Address is provided)

Lot/Part	Concession/Reference Plan	Municipality/Unorganized Township

County/District	Province/State	Country	Postal Code

Telephone Number (incl. area code)	Fax Number (incl. area code)	Mobile Number (incl. area code)
416 962-6262 ext.	416 965-6266	416 662-1437

Email Address
jim.mulvale@northlandpower.com

1.3 – Applicant Mailing Address

☑ Same as Applicant Physical Address

Civic Address

Unit Number	Street Number	Street Name (Include type and direction)	PO Box

City/Town/Municipality/Unorganized Township	Province/State

Country	Postal Code

Delivery Designator	Delivery Identifier	Postal Station

1.4 – Statement of Applicant

I, the undersigned hereby declare that, to the best of my knowledge:

- The information contained herein is complete and accurate in every way and I am aware of the penalties against providing false information as per s.184(2) of the *Environmental Protection Act*;
- I understand that by submitting this form, I am guaranteeing the completeness and accuracy of all the information provided on this form and included in the draft reports. Failure to submit the correct information will result in an incomplete application being returned;
- The Project Technical Information Contact identified below is authorized to act on my behalf for the purpose of obtaining approval under section 47.3 of the EPA for the Project identified herein.

Name of Signing Authority (Please print) (Last name, first name)
Mulvale, Jim

Title
Senior Director, Env.

Telephone Number (incl. area code)	Fax Number (incl. area code)	Mobile Number (incl. area code)
647 288-1273 ext.	416 962-6266	

Email Address
jim.mulvale@northlandpower.com

Signature

Date (yyyy/mm/dd)
2021/06/23

Section 2 – Project Information

2.1 – Application Type

☐ New Renewable Energy Approval

☑ Amendment to existing Renewable Energy Approval
Provide existing Renewable Energy Approval Number
5186-9HBJXR

Application Initiated by

☑ Applicant
☐ Client Services and Permissions Branch/Environmental Assessment and Permissions Branch
☐ Provincial Officer Order (attach copy)
☐ Other (describe):

Relevant pre-submission rules subject to/elected (please select one of the following)

Notice of Proposal to Engage **and** if applicable, Notice of First Public Meeting, distributed on or before December 31, 2010.	☐ 2010 Rules ☐ Elect into one or more 2011 Rules ☑ Elect into Current Rules	If "Elect into one or more 2011 Rules", please specify which rules:
Notice of Proposal to Engage **and** Notice of First Public Meeting (or if public meeting not required, drafts of the documents identified in paragraphs 1 and 2 of subsection 18(2) of the Regulation) distributed after December 31, 2010 and on or before July 1, 2012.	☐ 2011 Rules ☐ Elect into Current Rules	
Notice of Proposal to Engage **or** Notice of First Public Meeting distributed after July 1, 2012.	☐ Current Rules	

Current Environmental Compliance Approvals (please attach a separate list if more space is required)

Environmental Compliance Approval Number	Date of Issue (yyyy/mm/dd)
5186-9HBJXR	2014/06/26

Current Permit(s) to Take Water (please attach a separate list if more space is required)

Permit Number	Date of Issue (yyyy/mm/dd)

Project Schedule

Estimated date for start of construction/installation (yyyy/mm/dd)	Estimated date for start of operation (yyyy/mm/dd)
2021 08 30	2021 09 07

2.2 – Statement of Project Technical Information Contact

☑ The Project Technical Information Contact is the same as the Applicant (Identified in Section 1)

I, the undersigned hereby declare that, to the best of my knowledge:

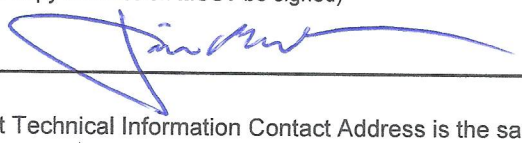
- The information contained herein and the information submitted in support of this application (electronically and in hard copy) is complete and accurate in every way and I am aware of the penalties against providing false information as per s.184(2) of the *Environmental Protection Act*.
- I understand that by submitting this form, I am guaranteeing the completeness and accuracy of this form and the draft documents. Failure to submit the correct information will result in the application being returned as incomplete.
- That the information contained in the electronically submitted application form is the same as the information submitted in the hard copy submission.
- I have used the most recent application form (as obtained from the "Renewable Energy Approvals" section of the Ministry of the Environment and Climate Change website at http://www.ontario.ca/environment-and-energy/renewable-energy-approvals or from the Client Services and Permissions Branch at 1-800-461-6290).

Name of Project Technical Information Contact (Please print) (Last name, first name)

Company

Telephone Number (incl. area code) ext.	Fax Number (incl. area code)	Mobile Number (incl. area code)

Email Address

Signature (hard copy submission **MUST** be signed)	Date (yyyy/mm/dd)
	2021/06/23

Address

☑ The Project Technical Information Contact Address is the same as the Applicant (Identified in Section 1)

Unit Number	Street Number	Street Name (Include type and direction)	PO Box

City/Town/Municipality/Unorganized Township	Province/State
Country	**Postal Code**

Delivery Designator	Delivery Identifier	Postal Station

2.3 – Other Approvals for Facility (Please attach a separate list if more space is required)

☐ A separate list is attached

List all other environmental approvals/permits applied for related to this project or received in relation to this project

Approval Number	Approval Date (yyyy/mm/dd)
Approval Number	Approval Date (yyyy/mm/dd)
Approval Number	Approval Date (yyyy/mm/dd)
Approval Number	Approval Date (yyyy/mm/dd)

Ontario Power Authority Reference (i.e. FIT) Number (if applicable)

F-002178-WIN-130-601

2.4 – Type of Renewable Energy Generation Facility (Select all that apply)

Wind	☐ Class 2	☐ Class 3	☑ Class 4	☐ Class 5
Other	☐ Biofuel	☐ Biogas	☐ Other (if other please describe):	
Anaerobic Digestion	☐ Class 1	☐ Class 2	☐ Class 3	
Solar Photovoltaic	☐ Class 3			
Thermal Treatment	☐ Class 1	☐ Class 2	☐ Class 3	

2.5 – Generation of Electricity

Total Maximum Name Plate Capacity	Total Expected Generation Capacity
100 MW (1 MW = 1000 kW / 1 kW = 0.001 MW)	99.32 MW (1 MW = 1000 kW / 1 kW = 0.001 MW)

Days and Hours of Operation

Section 3 – Site Information

3.1 – Project Location (The site/location where project will be located)

☐ The Project Location is the same as the Applicant's Address (Identified in Section 1)

Civic Address

Unit Number	Street Number	Street Name (Include type and direction)

City/Town	Province	Postal Code

Survey Address (Not required if the Civic Address is provided)

Lot/Part	Concession/Reference Plan	Municipality/Unorganized Township
Multiple - see below		

County/District	Province/State	Country	Postal Code
Huron	Ontario	Canada	N0M 0A0

Non Address Information (where the project spans many locations or a large rural area, specify how the project area relates to the address provided)

T-19: Concession 14 North, Part Lot 14, UTM easting = 446261 UTM northing = 4804829

T-34: Concession LRE Part Lot 27, UTM easting = 442243, UTM northing = 4800119

Geo Reference (Southwest corner of property)

Map Datum	Zone	Accuracy Estimate
NAD83	17	+/- 2m
Geo Referencing Method	**UTM Easting**	**UTM Northing**
GIS		

3.2 – Municipal or Local Authority Information (List all municipal or board authorities where the project is located. Attach a separate list if more space is necessary.)

Local Municipality (include each Single Tier or Lower Tier in which the project location is situated) / Unorganized Township

Name of Municipality/Unorganized Township

Bluewater

Address

Unit Number	Street Number	Street Name (Include type and direction)	PO Box
	14	Mill Ave.	

City/Town	Province	Postal Code
Zurich	ON – Ontario	N0M 2T0

Telephone Number (incl. area code)	Fax Number (incl. area code)	Mobile Number (incl. area code)
519 236-4351 ext. 226		

Email Address

cao@municipalityofbluewater.ca

Clerk

Last Name	First Name	Middle Initial

Telephone Number (incl. area code)	Email Address

Is the project location situated in one or more Upper Tier Municipality? (i.e., county, regional or district municipality)

☑ Yes ☐ No

Is the project location situated in a Local Roads area?

☐ Yes ☑ No

Is the project location in a Local Service Board area?

☐ Yes ☑ No

3.3 – Site Information (Information about the site/location where project will be located)

Site Name	MOE District Office

Is any portion of the Project location on federally owned land or a reserve?	☐ Yes	☑ No
Is any portion of the Project location on Crown Land?	☐ Yes	☑ No
Is the Project location that is the subject of this application owned by the Applicant? If "no", please attach the owner's name, address and a signed letter granting consent for the installation and operation of the facilities.	☐ Yes	☑ No
Is the Applicant the operating authority of the facility that is the subject of this application? If "no", please attach the operating authority name, address and phone number.	☑ Yes	☐ No
Is the Project location in the area of the Niagara Escarpment Plan?	☐ Yes	☑ No
Is the Project location in the area subject to the Oak Ridges Moraine Conservation Plan?	☐ Yes	☑ No
Is the Project location in the Protected Countryside as shown in Schedule 1 to the Greenbelt Belt Plan?	☐ Yes	☑ No
Is the Project location in the Lake Simcoe Watershed as defined in the *Lake Simcoe Protection Act, 2008*?	☐ Yes	☑ No
Is the Project location in the Central Pickering Development Planning Area as shown in Schedule 1 to the Central Pickering Development Plan?	☐ Yes	☑ No
Has an Archaeological Report (s. 22) been prepared as part of the complete submission?	☑ Yes	☐ No
Has a Heritage Report (s.23) been prepared as part of the complete submission?	☑ Yes	☐ No
Has an Environmental Impact Study Report (s.38, s. 41 or s. 43) been prepared as part of the complete submission?	☑ Yes	☐ No
Has a Water Assessment Report or supplementary reporting on any additional mitigation (s.39, s. 40, s.44 s. 45) been prepared as part of the complete submission?	☑ Yes	☐ No
Does the Project require any authorizations under the *Endangered Species Act, 2007*?	☐ Yes	☑ No
If "yes", have they been obtained from the Ministry of Natural Resources?	☐ Yes	☑ No

Section 4 – Supporting Documents

4.1 – Supporting Documentation and Technical Requirements

This is a list of all supporting information to this application and is subject to the FIPPA and EBR.

Mandatory	Attachment	Attached	Reference	Confidential*
Yes	Proof of Legal Name of Applicant.	☑ Yes ☐ No	Always Mandatory	☐
Yes	A map that identifies the project location.	☑ Yes ☐ No	Always Mandatory	☐
	Name, Address and Phone Number of the Operating Authority.	☑ Yes ☐ No	Mandatory if applicant not operating authority.	☐
	Name, Address and consent of land/site owner for the installation/construction and operation of the facility.	☐ Yes ☐ No	Mandatory if applicant not landowner	☐
Yes	Project Description Report.	☐ Yes ☑ No	Mandatory	☐
Yes	Design and Operations Report.	☐ Yes ☑ No	Mandatory for all but Class 2 Wind Facility.	☐
Yes	Decommissioning Plan Report.	☐ Yes ☑ No	Mandatory for all but Class 2 Wind Facility.	☐
Yes	Construction Plan Report.	☐ Yes ☑ No	Mandatory for all but Class 2 Wind Facility.	☐
Yes	Consultation Report.	☐ Yes ☑ No	Mandatory for all but Class 2 Wind Facility.	☐
	Development Permit under the *Niagara Escarpment Planning and Development Act.*	☐ Yes ☐ No	Mandatory where permit required by NEC.	☐
Yes	A copy of this application has been sent to the Ministry local district office(s).	☑ Yes ☐ No	Always Mandatory	☐
	Report(s) that sets out a description of and rationale for the proposed change or alteration.	☑ Yes ☐ No	Mandatory for Amendment to REA applications.	☐
	Document(s) required under Part IV the Regulation to be submitted as part of the application (list below).	☐ Yes ☐ No		☐
	Document(s) required for the purposes of obtaining an exemption from a provision of Part V of the Regulation (list below).	☐ Yes ☐ No		☐

Other Information Submitted in Support of the Application for the issue of a new, or amendment to an existing, Renewable Energy Approval, including any document that is required under Part IV of the Regulation and/or for the purposes of obtaining an exemption from a provision of Part V of the Regulation.

Title	Reference	Confidential*
Modification Document		☐
Siemens (SGRE) Speed Increase Memo		☐
NRSI Mortality Assessment Memo		☐
Aercoustics Memo Re - Tonality		☐
Original and Amended REA Permits		☐
		☐
		☐
		☐
		☐
		☐
		☐
		☐

Are you attaching an additional list of documents? ☐ Yes ☑ No

If there is not enough space to list all of the attached documents included in this application package, please include an additional listing of these attachments.

***Note:** The collection of personal information in this application is necessary to administer the Ministry's approvals program, which is authorized pursuant to the *Environmental Protection Act*. The personal information collected in this application will be used to administer the program, including for the purposes of the Ministry's compliance and enforcement activities under the aforementioned acts, and for the purposes of making information in respect of the Renewable Energy Approval available to the public with the exception of payment

Ontario

Ministry of the Environment and Climate Change

Renewable Energy Approval Application

Payment Information

For Office Use Only			
Reference Number	Payment Received	Date (yyyy/mm/dd)	Initials
	$		

Note:

1. All fees should be paid in Canadian funds, payable to the Ontario Minister of Finance.
2. Credit card payments are accepted for payments under $10,000 only.
3. This page can only be mailed or faxed to our office with this application. For the protection of your credit card information, do not submit by email.
4. If you are paying by certified cheque or money order, please staple your payment to this page.
5. Do not include this page in the copies of your application that are being provided to the local MOE District Office or the local municipality(s).
6. The information collected in this section of the form is considered confidential and will only be used to process your application fee.

Amount enclosed

$ 300.00

Method of Payment

- ☐ Certified Cheque
- ☐ Money Order
- ☐ Visa
- ☑ MasterCard

Name on Card (please print)

Jim Mulvale - payment will be sent separately as is current Covid-19 practice

Credit Card Number

Expiry Date (mm/yyyy)

Cardholder Signature

Date (yyyy/mm/dd) 2021/06/23

If paying by certified cheque or money order, please attach it here.

Modification Document

Wind Turbine Blade Noise Reduction Add-on Upgrade Trial

Grand Bend Wind LP

Northland Power Inc.

June 17, 2021

Table of Contents

List of Appendices

1.0 Introduction

Grand Bend Wind Limited Partnership (GBWLP), by its general partners, Grand Bend Wind GP Inc. and with Northland Power Inc. (Northland) as agent, has constructed a 100 MW wind power facility located near the community of Grand Bend, Ontario. This project is classified as a Class 4 Wind facility and was approved by the Ministry of Environment, Conservation and Parks (MECP) under Ontario Regulation 359/09 of the Ontario Environmental Protection Act. This approval, Renewable Energy Approval (REA) number 5186-9HBJXR, was amended on March 24, 2015 and again April 12, 2017.

The project consists of forty 2.483 MW Siemens SWT-3.0-113 wind turbine generators located Huron County, specifically the lower-tier municipalities of Bluewater and Huron South. Portions of the transmission line also traverse the municipality of Huron East and municipality of West Perth County.

The purpose of this Modification Document is to provide a description of and rationale for the changes to the Project proposed herein, as well as a summary of any necessary changes to Project information related to the project's REA. This document is one component of an application to amend the Project's REA.

2.0 Project and Applicant Information

Table 1: Project Information

Project Name	Grand Bend Wind Farm (GBWF)
Energy Source	Wind
Nameplate Capacity	100 MW
Facility Class	Class 4, Wind Facility
REA Number	5186-9HBJXR
IESO FIT Contract Number	F-002178-WIN-130-601

Table 2: Applicant Information

Name of Applicant	Grand Bend Wind LP, by its general partners Grand Bend Wind GP Inc., and with Northland Power Inc. as agent
Primary Contact	Jim Mulvale, P. Eng., Senior Director, Environment
Mailing Address	Northland Power Inc. 30 St. Clair Avenue West, 12th Floor Toronto, ON M4V 3A1
Phone	416-662-1437

3.0 Proposed Modifications

3.1 Summary of Proposed Change

Northland proposes to modify noise reduction add-ons installed on the wind turbine blades of two of the facility's turbines, on a trial basis. This modification will reduce the sound levels from the turbines, and associated adjustments to the pitch angles of the turbine blades may increase power output slightly. The wind turbines currently under-produce electricity versus initial expectations. It is hoped that the new blade add-ons will reduce noise levels, while the blade pitch adjustments will recapture some of the missing production while maintaining compliance with the project's approved noise limits. If the trial is successful, with lower or equal noise levels sustained and slightly higher production output achieved, then the wind turbine blade modifications would be implemented at the remaining 38 turbines.

3.2 Description of Proposed Change

The Siemens Gamesa Renewable Energy (SGRE) SWT-3.0-113 (derated to 2.483 MW) wind turbine blades are originally designed to include two add-on devices that mitigate noise generated by the blades while they operate. Specifically, the wind turbine blades at the GBWF currently include SGRE D-type Dinotails and Vortex Generators for this purpose.

Northland proposes to modify these add-ons by relocating the D-type Dinotails to the mid-span area of the turbine blade and add new F-type Dinotails and additional Vortex generators at the end section of the turbine blade. The two types of Dinotails are shown below.

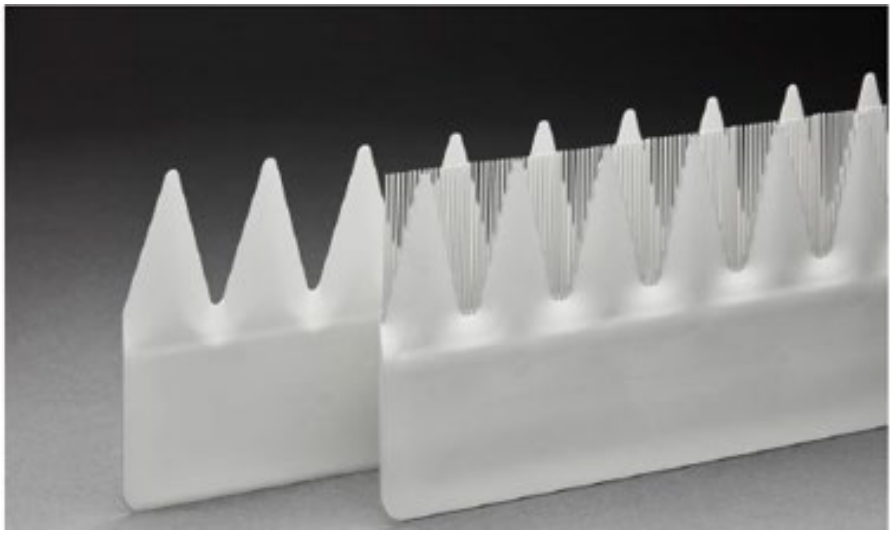


Figure 1: Siemens Gamesa Renewable Energy D-type and F-type Dinotails

The original D-type serrated Dinotail is shown on the left, and the F-type Dinotail (with the fine combs added to the serrations) is in the front/right of the image.

Northland proposes to implement the blade modification trial at turbines T19 and T34. A GBWF Site Plan is attached in Appendix A, which indicates the location of the facility's turbines. A SGRE information package for the Dinotails is attached to this report in Appendix B.

Northland will conduct pre-modification and post-modification noise E-emission audits, in the down-wind and cross-wind locations, for both wind turbines. If the trial is successful, with lower or equal noise levels sustained and slightly higher production output achieved, then the wind turbine blade modifications would be implemented at the remaining 38 turbines.

3.3 Rational for Proposed Change

The GBWF uses forty Siemens SWT-3.0-113 wind turbines, which are derated to 2.483 MW to comply with noise requirements and to deliver the 100 MW output contracted under the FIT contract with the IESO. Currently the wind turbines are under-performing slightly, particularly at higher wind speeds. The Proposed Change of modifying the turbine blade noise reduction add-ons to include both D-type and F-type Dinotails and additional Vortex Generators, should decrease the turbine blade noise and help restore some of the missing electricity output as described below.

The wind turbines automatically adjust the pitch of the turbine blades as the wind speed changes. The blade pitch is adjusted to capture as much wind as possible, while maintaining proper airflow across the blade and not causing aerodynamic "stalls". How much wind is captured translates into blade rotation and electricity generation. With the proposed turbine blade noise reduction add-ons to including both D-type and F-type Dinotails and additional Vortex Generators, there is no change to the turbine's performance when the winds are under 7.5 m/s. When the winds are 7.5 m/s or higher, then SGRE predicts a noise reduction of 1 to 1.5 dBA and the pitch settings can be altered to try and recapture some of the missing production with the current pitch settings. During these higher wind regimes, the blade rpm may increase between 0.25 to 0.5 rpm above current, which is an increase of 2 – 4 %

While SGRE assures that the proposed blade modifications will achieve the predicted noise reduction, they are unable to provide sound emission data specifically for SWT-3.0-113 turbine operating at the 2.483 MW derate. Hence, Northland is proposing to conduct a trial on two of the facility's 40 turbines, where turbine noise emission data collected before the modifications is compared with data collected after the modifications are completed.

3.4 Additional Environmental Risks and Mitigation

No additional environmental risks are anticipated as a result of the changes to the project proposed herein.

4.0 Summary of Revisions to REA Supporting Documents

This section addresses amendments to the supporting documents submitted with the REA application necessitated by the changes proposed in this document.

4.1 Construction Plan Report

No changes to the Construction Plan Report are required as a result of the change to the Project proposed herein.

4.2 Design and Operation Report

No changes to the Design and Operation Report are required as a result of the change to the Project proposed herein.

4.3 Decommissioning Report

No changes to the Decommissioning Report are required as a result of the change to the Project proposed herein.

4.4 Heritage Assessment Report

No changes to the Heritage Assessment Report are required as a result of the change to the Project proposed herein.

4.5 Project Description Report

No changes to the Project Description Report are required as a result of the change to the Project proposed herein.

4.6 Water Assessment and Water Body Report

No changes to the Water Assessment and Water Body Report are required as a result of the change to the Project proposed herein.

4.7 Natural Heritage Assessment and Environmental Impact Study

No changes to the Natural Heritage Assessment and Environmental Impact Study are required as a result of the change to the Project proposed herein.

4.8 Noise Assessment Study Report

No changes to the Noise Assessment Study Report are required, as any changes will be insignificant and are expected to be beneficial (noise reduction). This proposal is a two turbine

trial request to verify the noise reduction expectation and the changes will be implemented across the full wind farm only if the trial is successful.

Appendix A

GBWF Site Plan

Path: \\elmo\gis\Project\P Jobs\PI Jobs\PIA019991\Map\Working\019991 Wind Turbine With Aeronautical Obstruction Lighting.mxd

Turbines With Aeronautical Obstruction Lighting

Grand Bend Wind Farm

Grand Bend Wind Limited Partnership

Aircraft Detection System

Wind Turbine With Aeronautical Obstruction Lighting

Wind Turbine (No Obstruction Lighting)

Met. Tower

NOTES:

The primary source of base features on this map originate from Natural Resource Canada's CanVec product. Supplementation using GIS or remote sensing based data from provincial, municipal, or private sources may also be present.

Different themes represented on this map reflect different levels of temporal accuracy. Transportation, hydrographic, and cadastral features are more likely to reflect current ground conditions. Vegetation, land use, and cultural landmarks (e.g. buildings and other structures), especially around urban areas are will be less temporally accurate.

DATA SOURCES:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada
3. County of Huron
4. Northland Power Inc.

DISCLAIMER:

Neegan Burnside Ltd and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Scale:1:50,000
Date: 29 June 2016
Project Number: PIA019991

Projection: UTM Zone 17
Datum: NAD 83 CSRS

Prepared: PS

N

0 1,000 2,000 3,000 4,000

Meters

NEEGAN BURNSIDE

81°45'0"W 81°44'0"W 81°43'0"W 81°42'0"W 81°41'0"W 81°40'0"W 81°39'0"W

43°28'0"N 43°27'0"N 43°26'0"N 43°25'0"N 43°24'0"N 43°23'0"N 43°22'0"N 43°21'0"N 43°20'0"N 43°19'0"N

T-01 T-02 T-03 T-05 T-06 T-07 T-08 T-09 T-11 T-12 T-13 T-14 T-16 T-17 T-18 T-19 T-20 T-21 T-22 T-23 T-25 T-26 T-27 T-29 T-30 T-31 T-32 T-33 T-34 T-35 T-37 T-38 T-39 T-41 T-42 T-43 T-44 T-45 T-46 T-48

Actual Met Tower Located 130m East of Displayed Position

Drysdale
Blake
Dewey Point
St. Joseph
Grand Bend
Mun. of Bluewater
Mun. of South Huron
Mun. of Huron Shores
Ausable River
Highway 21

Appendix B

SGRE Dinotails Information

(portion of presentation to MECP May 2019)

Low-noise wind turbine design using DinoTails® Next Generation

May 2019

SIEMENS Gamesa
RENEWABLE ENERGY

SGRE noise reduction technologies

Low-noise turbine control settings

Minimize energy loss by tailored RPM and pitch curves

Blade design

Optimized for performance and noise

Low-noise blade add-ons

Applied to new turbines and existing fleet (retrofit); Can reduce noise and increase power output

SIEMENS Gamesa RENEWABLE ENERGY

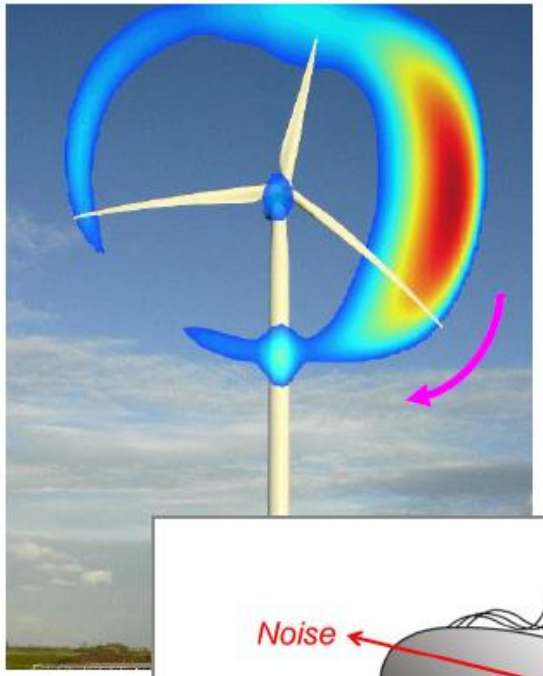
Wind turbine noise sources

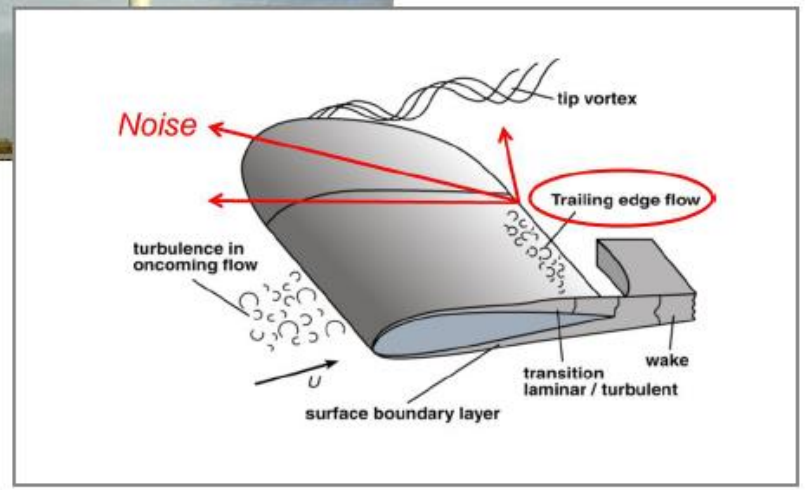
Dominant source is aerodynamic noise from blades

Noise caused
by turbulent air flow over blade surface

Most noise
produced by outer part of blades

Noise generated
at trailing edge of the blade





SIEMENS Gamesa
RENEWABLE ENERGY

Blade add-ons

Add-ons used to improve blade performance

- Increase power output
- Improve the performance

Trailing edge serrations

- Most successful noise reduction add-on
- DinoTails® introduced by Siemens around 2002
- Serrations now used by several manufacturers

Optimization of serration concept

- How low can we go??

Can we do better than optimized serrations?

- Yes we can ☺

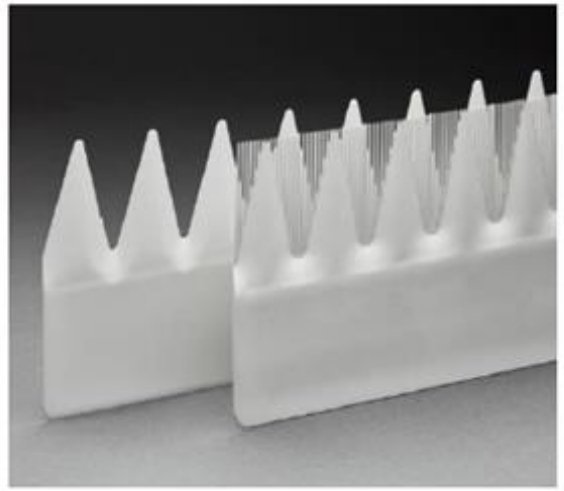
SIEMENS Gamesa
RENEWABLE ENERGY

SGRE DinoTails® Next Generation

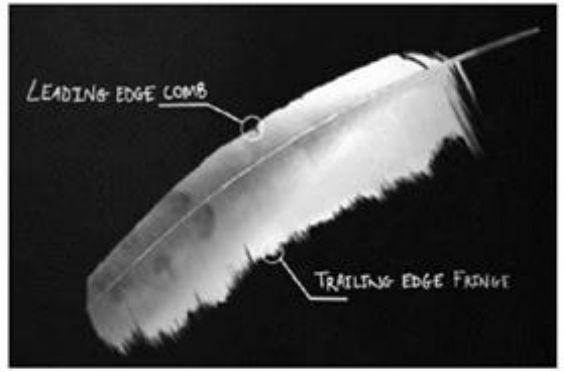
Trailing edge serrations

- Different types to optimize noise and aerodynamic performance

In 2016 SGRE introduced DinoTails® Next Generation



- 'Owl technology' for even larger noise reduction
- Small combs between teeth create small vortices: Less noise



SIEMENS Gamesa
RENEWABLE ENERGY

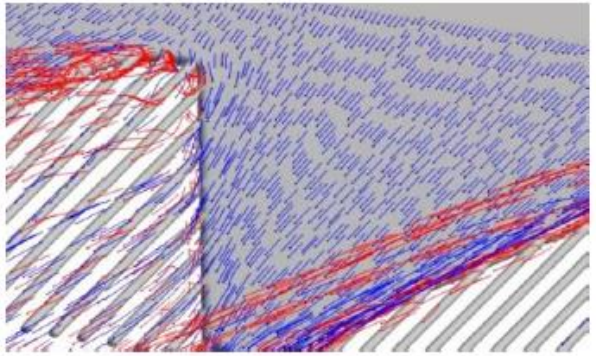
Design and performance

DinoTails® Next Generation now applied to most onshore SGRE turbines

- DinoTails® Next Generation layout optimized for each turbine type
- Optimized for acoustics, aerodynamics, and structure: Minimize LCoE

Advanced design and validation methods

- Various computational aerodynamics/ acoustics methods
- State-of-the-art wind tunnel and field testing



SIEMENS Gamesa RENEWABLE ENERGY

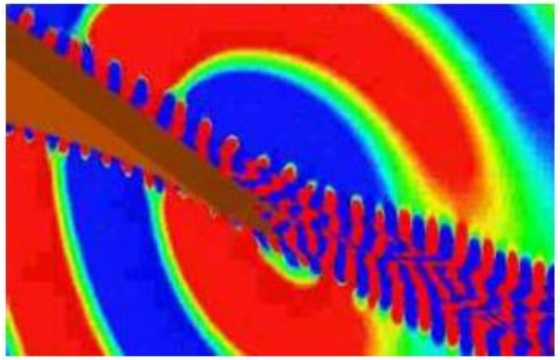
Robust performance on all platforms

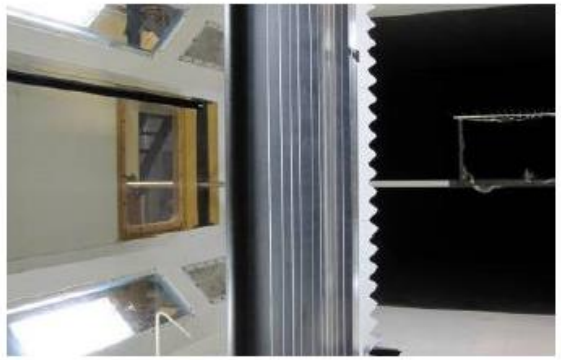
Optimized DinoTails® Next Generation design for different blades

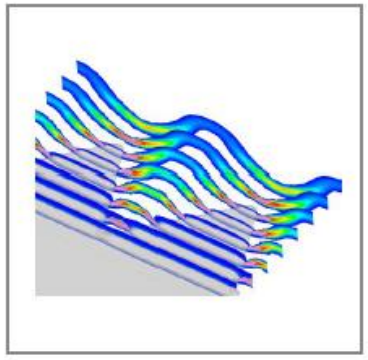
Tooth angle, length, aspect ratio, radial layout, etc.

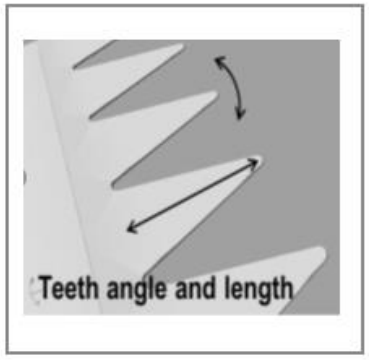
Proven performance using different methods

- Computational Fluid Dynamics and Aeroacoustics
- Acoustic and aerodynamic wind tunnel testing
- Structure: Highly accelerated lifetime tests (UV, vibrations)
- Power and noise curve validation in IEC field tests



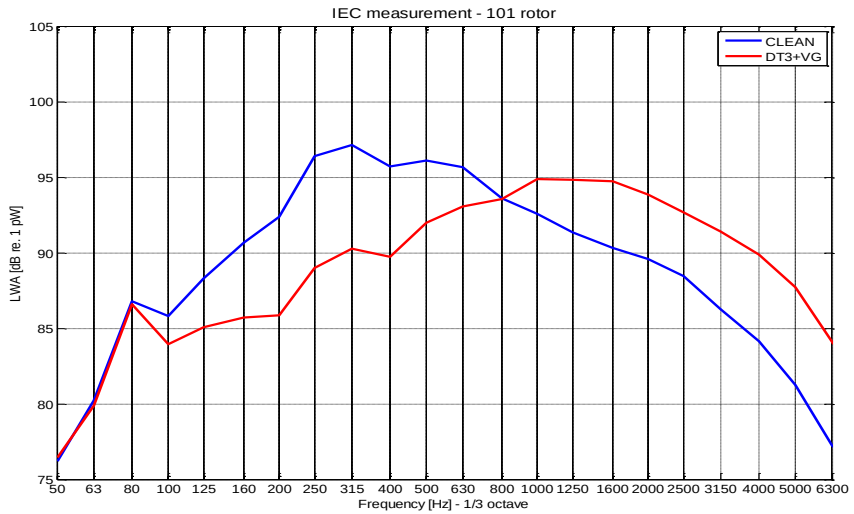






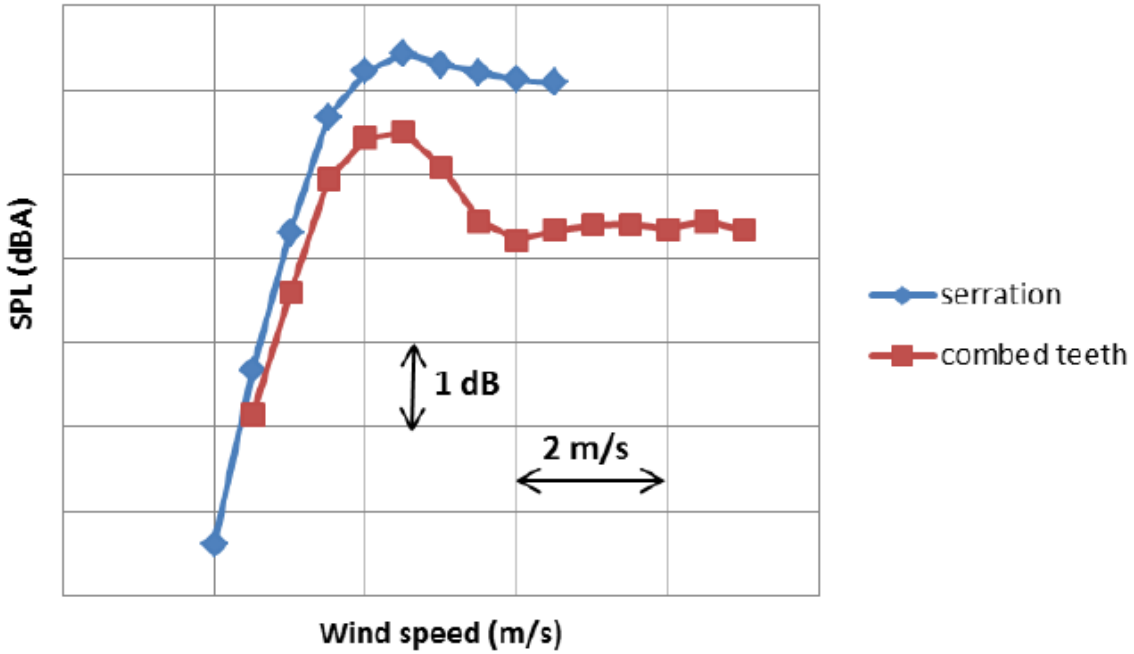
SIEMENS Gamesa
RENEWABLE ENERGY

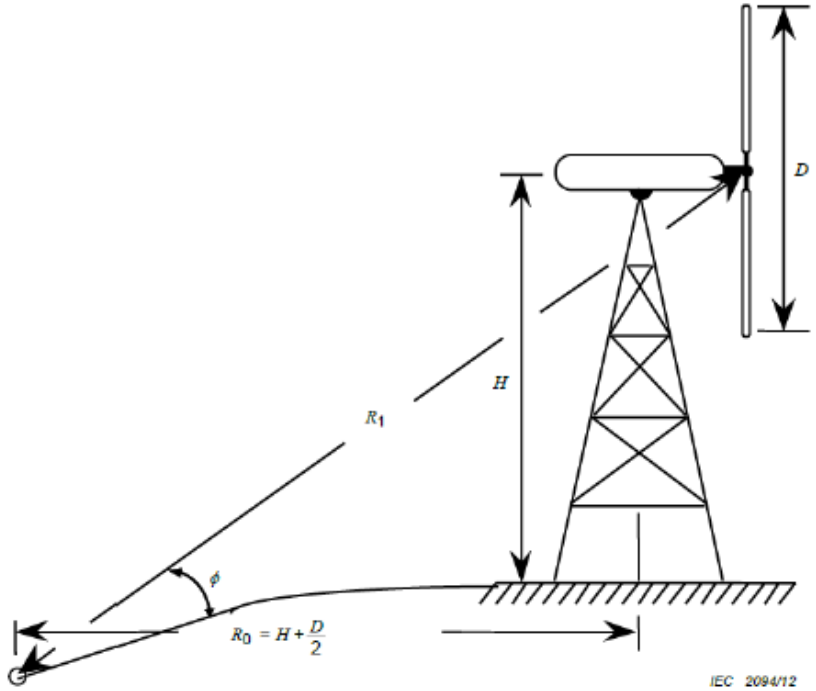
Impacts on sound levels in the near field



Serrated edge: Frequency shift due to acoustic diffraction and scattering

Brushes: Further shift due to break-down of turbulence structures





SIEMENS Gamesa
RENEWABLE ENERGY

Grand Bend - SG 3.0-113 - Change in Rotor Speed for the Blades with F-type Dinotails

SGRE has proposed new blade add-ons for SWT 3.0-113 wind turbines at Grand Bend Wind Farm. The purpose of new blade add-ons is to reduce the noise and improve the performance of the turbine. The new configuration includes the extension of the serrated edges along the trailing edge of blades as well as replacing the existing serrated edges with SGRE Next Generation Dinotails (*aka* F-type Dinotails). The new design also comes with an optimized control strategy the increases the rotor speed at higher wind speeds. The change in rotor speed is listed in table 1 as a function of hub height wind speed.

W_s* [m/s]	$\Delta\omega$** [rpm]
3.0	0.0
3.5	0.0
4.0	0.0
4.5	0.0
5.0	0.0
5.5	0.0
6.0	0.0
6.5	0.0
7.0	0.0
7.5	+0.2
8.0	+0.5
8.5	+0.5
9.0	+0.5
9.5	+0.5
10.0 m/s up to cut-out wind speed	+0.5

Table 1: Increase in Rotor Speed for the New Blade Design for SWT-3.0-113 (Rotor Diameter = 113 m)

***** W_s: horizontal wind speed value at the hub height averaged every 10 minutes.

****** $\Delta\omega$ = Rotor Speed [New Blade Design] – Rotor Speed [Old Blade Design]

aercoustics

Aercoustics Engineering Ltd.
1004 Middlegate Road, Suite 1100
Mississauga, ON L4Y 0G1

Tel: 416-249-3361
Fax 416-249-3613
aercoustics.com

March 5, 2021 Aercoustics Project #: 11167.09

Ministry of Environment Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, ON
M4V 1P5

ATTN: Ian Greason, MECP

CC: Jim Mulvale, Northland Power

Subject: Grand Bend Wind
F-Type Dino Tail Proposed Pilot Project – Tonality Considerations

1 Introduction

Grand Bend Wind Farm is contemplating the installation of a new generation of serrated trailing edges know as F-type DinoTails (DFTs) on the Grand Bend Wind turbines. The rationale for this change is to improve the project's power production efficiency with the added benefit of a reduced noise impact on nearby receptors to the Grand Bend Wind Farm.

The expected noises reduction of the DFTs on the Grand Bend wind turbines sound power is on the order of a 0.7-1.5 dBA reduction. Please see below for details from Siemens-Gamesa (SGRE).

"Based on all near-field measurements completed by SGRE, the DTS add-on solution has consistently demonstrated decreased aerodynamic sound power levels in the range of 0.7-1.5 dBA (broadband) on B55 blade types. Also, due to significant shift in sound power spectra from low to high frequency bands, further reductions of sound pressure levels, i.e., greater than 1.5 dBA, can be expected at the receptor locations depending on the distance from the receptor as well as site specific/terrain conditions."

From initial discussions with the MECP there is a concern that a reduction is sound power level (i.e., aerodynamic broadband noise) could potentially increase the tonal audibility of the turbines with the DFTs installed.

The Emission tests conducted at Grand Bend WTG T05 and WTG T19 have been evaluated to determine the potential for increased tonal audibilities with the DFTs installed.

2 Tonality Results from E-audits

Excerpts from the E-audit reports approved as part of the REA reporting requirements (Report #02.0031.002 and Report #02.0031.003) are provided below.

6 CONCLUSIONS

The measurements and analysis, performed in accordance with the methods prescribed in IEC Standard 61400-11:2012 indicate that the sound power level of WTG T05, a Siemens SWT 3.0-113 wind turbine, rated at 2483 kW, has the following sound power levels:

Hub Height Wind Speed [m/s]	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12
Sound Power Level $L_{WA,k}$ in dB(A):	**100.3**	**100.5**	**100.8**	**100.8**	**101.1**	**101.0**	**100.9**	**101.2**	**101.0**	**100.7**
Tonal Audibility, ΔL_{ak} in dB:	<-3.0	<-3.0	<-3.0	<-3.0	<-3.0	<-3.0	-2.8	-2.5	-2.9	-1.5
Total Uncertainty $u_{LWA,k}$ in dB:	0.8	0.9	0.8	0.9	0.9	0.8	0.9	0.9	1.0	1.0

The sound levels presented above are relevant for WTG T05 given the environmental conditions and the operating parameters of the turbine during the testing periods.

6 CONCLUSIONS

The measurements and analysis, performed in accordance with the methods prescribed in IEC Standard 61400-11:2012 indicate that the sound power level of WTG T19, a Siemens SWT 3.0-113 wind turbine, rated at 2483 kW, has the following sound power levels:

Hub Height Wind Speed [m/s]	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12
Sound Power Level $L_{WA,k}$ in dB(A):	**100.8**	**101.0**	**101.0**	**101.0**	**100.9**	**100.8**	**100.8**	**101.0**	**101.0**	**100.8**
Tonal Audibility, ΔL_{ak} in dB:	<-3.0	<-3.0	<-3.0	<-3.0	<-3.0	<-3.0	<-3.0	<-3.0	<-3.0	<-3.0
Total Uncertainty $u_{LWA,k}$ in dB:	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8

The sound levels presented above are relevant for WTG T19 given the environmental conditions and the operating parameters of the turbine during the testing periods.

Both E-audits for WTG T05 and WTG T19 had low tonal audibility results that are not reportable (less than -3dB) in most wind bins. Some tones were detected for WTG T05 however the maximum tonal audibility is -1.5 dB in the 12m/s wind bin. A tone with an audibility below 0 dB is considered 'not audible'. It is expected that if the aerodynamic blade masking noise is reduced by 1.5 dB and the corresponding tonal audibility is increased by 1.5 dB the turbines will still be at or below the 0 dB threshold making the tones not audible.

These results indicate that there is a low probability of any tonal issues with the implementation of the F-type DinoTails.

Sincerely,

AERCOUSTICS ENGINEERING LIMITED

A. Munro

Allan Munro, P.Eng

Payam Ashtiani, B.A.Sc., P.Eng

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

May 20, 2021 Project No. 2408-B

Jim Mulvale
Northland Power Inc.
30 St. Clair Ave W, 12th Floor
Toronto, Ontario M4V 3A1

Dear: Jim Mulvale

Re: Grand Bend Wind Farm
Technical Opinion on the Installation and Relocation of DinoTails

Natural Resource Solutions Inc. (NRSI) has prepared the following memo to summarize a technical review and opinion of the proposed installation of 'F-type DinoTails' at the Grand Bend Wind Farm (Project), with specific consideration relating to the potential for negative effects to birds, bats, and/or raptors. As part of NRSI's review and consideration of the proposed installation, NRSI has spoken directly with representatives of Siemens Gamesa Renewable Energy (SGRE) to obtain specific information relating to technical and operational changes that may occur as a result of the installation.

Background

NRSI understands that F-type DinoTails are an add-on feature which is applied to portions of the trailing edge of turbine blades for the purpose of reducing noise and improving the performance of the turbine. NRSI also understands that the turbines at the Project currently have similar D-type DinoTails installed, beginning at the blade tip and extending approximately 12m along each blade.

Based on discussions with Northland Power Inc. and SGRE, NRSI understands that the proposed installation will include the replacement of the existing D-type DinoTails with the F-type DinoTails, extending from the blade tip for approximately 12m along each blade. The D-type DinoTails will be relocated to extend from approximately 12m to 24m (as measured from blade tip), totaling approximately 24m of DinoTails along the trailing edge of each blade. In addition, NRSI understands that new vortex generators will be installed adjacent to the F-type DinoTails as part of the proposed modifications for improved performance.

A primary consideration in assessing potential changes in risk to wildlife from this proposed change is the effects of this installation on the rotor speed (i.e., revolutions per minute; rpm) of the blades under different weather conditions. NRSI has reviewed technical material provided by SGRE which indicates that at low to moderate wind speeds (up to 7.0 m/s), there will be no anticipated change to the rotor speed as a result of this proposed modification. At higher wind speeds, above 7.0 m/s, NRSI understands that the rpm of the turbine may increase by approximately 1.7-4.2%, depending on the specific environmental conditions.

NRSI has used this general understanding of the technical application and change in operational specifications to inform the following technical opinions.

Risk Assessment to Bats

Material provided to NRSI indicates that the proposed blade modifications will not result in any changes to turbine rpm at low to moderate wind speeds (up to 7.0 m/s), including no change to

turbine operations during periods of operational curtailment. Since bat activity typically occurs during periods of low wind speed, the turbine operation will remain unchanged during periods when bats are expected to be most active.

NRSI has also considered the aerial extent of low pressure that follows the turbine blades, based on the possibility of these areas contributing to bat mortality by way of 'barotrauma'. Although NRSI was not able to obtain any specific details on the area of low pressure, NRSI understands that an intended purpose of the proposed modification is to improve the aerodynamics of the turbine blades. This intended purpose suggests that changes to the aerial extent of low pressure following the turbine blades, if any, are more likely to decrease (as opposed to increase) as a result of a more aerodynamic blade profile. In this case, it's possible that the proposed installation may actually have a positive effect in reducing the potential risk to bats, by likely reducing the aerial extent of low pressure that follows the blades. However; any potential positive effect is expected to be negligible, and non-material, to overall risk of mortality.

NRSI is of the opinion that the proposed blade modifications are unlikely to result in a material change to the potential mortality risk to bats.

Risk Assessment to Birds (incl. Raptors)

NRSI is not aware of any existing literature that considers specific blade configurations of vortex generators and DinoTail installations relative to the potential risk to birds, including raptors, or that specifically links mortality risk to specific wind speeds or weather conditions. As a result, NRSI has considered the minor increases in rotor speed (i.e., 1.7-4.2%) that may occur at higher wind speeds, and believe that these minor changes are unlikely to result in any material change to mortality risk to birds, including raptors.

NRSI has also considered the placement of the F-type DinoTails on the trailing edge of turbine blades, and notes that there will be no material change to the portions of the blade that would be most likely to make contact with wildlife during instances of collision.

NRSI does not anticipate that the proposed modifications will have any material change to the potential mortality risk to birds, including raptors.

Summary

NRSI has prepared this technical opinion on the potential change in risk to wildlife that may result from the proposed modifications to the blades of the Project, as described above.

NRSI has considered technical specifications provided by SGRE, in combination with NRSI's extensive experience monitoring wildlife impacts at more than 55 facilities in Ontario and NRSI's understanding of risk factors that may contribute to mortality of bats, birds, and raptors.

Through a review of available information, NRSI is of the opinion that the proposed modifications are unlikely to result in a material change to the mortality risk to bats or birds, including raptors. This opinion is largely based on no operational changes to rpm at low to moderate wind speeds, minimal changes to rotor speed (1.7-4.25% increase) at higher wind speeds, and the physical location of the installation along the trailing edge of the turbine blades.

Best Regards,

Andrew Ryckman, P.Biol.
Senior Biologist

Ontario

Ministry of the Environment
Ministère de l'Environnement

RENEWABLE ENERGY APPROVAL

NUMBER 5186-9HBJXR
Issue Date: June 26, 2014

Grand Bend Wind GP Inc. as general partner for and on
behalf of Grand Bend Wind Limited Partnership
30 St. Clair Avenue West, Unit 1700
Toronto, Ontario
M4V 3A1

Project Location: Grand Bend Wind Farm
Generally bound by Lake Huron to west, Main Street/Grand Bend Line to the south, Bronson Line to east, Staffa Road to north, and a transmission line along Sararas Road, Rodgerville Road, and Road 183.
Municipality of Bluewater, Municipality of South Huron, Municipality of Huron East, Municipality of West Perth, Huron County, and Perth County

You have applied in accordance with Section 47.4 of the Environmental Protection Act for approval to engage in a renewable energy project in respect of a Class 4 wind facility consisting of the following:

- the construction, installation, operation, use and retiring of a Class 4 wind facility with a total name plate capacity of 100 megawatts.

For the purpose of this renewable energy approval, the following definitions apply:

1. "Acoustic Assessment Report" means the report included in the Application and entitled "Grand Bend Wind Farm - Environmental Noise Impact Assessment Report", dated April 15, 2014 and signed by Michael Medal and Payam Ashtiani, Aercoustics Engineering Limited;

2. "Acoustic Audit - Emission" means an investigative procedure that is compliant with the CAN/CSA Standard C61400-11-07 and consisting of measurements and/or acoustic modelling of noise emissions produced by wind turbine generators, assessed to determine compliance with the manufacturer's noise (acoustic) equipment specifications and emission data of the wind turbine generators, included in the Acoustic Assessment Report;

3. "Acoustic Audit - Immission" means an investigative procedure consisting of measurements and/or acoustic modelling of all sources of noise emissions due to the operation of the Equipment, assessed to determine compliance with the Noise Performance Limits set out in this Approval;

4. "Acoustic Audit Report-Emission" means a report presenting the results of the Acoustic Audit - Emission;

5. "Acoustic Audit Report-Immission" means a report presenting the results of the Acoustic Audit - Immission;

6. "Acoustic Audit - Transformer Substation/Transformer and Reactor" means an investigative procedure that is compliant with the IEEE Standard C57.12.90 consisting of measurements and/or acoustic modelling of all noise sources comprising the transformer substation/transformer and reactor, assessed to determine compliance with the Sound Power Level specification of the transformer substation described in the Acoustic Assessment Report.

7. "Acoustic Audit Report - Transformer Substation/Transformer and Reactor" means a report presenting the results of the Acoustic Audit - Transformer Substation/Transformer and Reactor.

8. "Acoustical Consultant" means a person currently active in the field of environmental acoustics and noise/vibration control, who is knowledgeable about Ministry noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from wind facilities;

9. "Act" means the *Environmental Protection Act* , R.S.O 1990, c.E.19, as amended;

10. "Adverse Effect" has the same meaning as in the Act;

11. "Application" means the application for a Renewable Energy Approval dated February 5, 2013, and signed by John Brace, President and CEO, Grand Bend Wind GP Inc., and all supporting documentation submitted with the application, including amended documentation submitted up to the date this Approval is issued;

12. "Approval" means this Renewable Energy Approval issued in accordance with Section 47.4 of the Act, including any schedules to it;

13. "A-weighting" means the frequency weighting characteristic as specified in the International Electrotechnical Commission (IEC) Standard 61672, and intended to approximate the relative sensitivity of the normal human ear to different frequencies (pitches) of sound. It is denoted as "A";

14. "A-weighted Sound Pressure Level" means the Sound Pressure Level modified by application of an A-weighting network. It is measured in decibels, A-weighted, and denoted "dBA";

15. CAN/CSA Standard C61400-11-07, "Wind Turbine Generator Systems – Part 11: Acoustic Noise Measurement Techniques", dated October 2007;

16. "Class 1 Area" means an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum";

17. "Class 2 Area" means an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 Areas:

    1. sound levels characteristic of Class 1 during daytime (07:00 to 19:00 or to 23:00 hours);

    2. low evening and night background sound level defined by natural environment and infrequent human activity starting as early as 19:00 hours (19:00 or 23:00 to 07:00 hours);

    3. no clearly audible sound from stationary sources other than from those under impact assessment.

18. "Class 3 Area" means a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as the following:

    1. a small community with less than 1000 population;

    2. agricultural area;

    3. a rural recreational area such as a cottage or a resort area; or

    4. a wilderness area.

19. "Company" means Grand Bend Wind GP Inc., as general partner for and on behalf of Grand Bend Wind Limited Partnership, the partnership under the laws of Ontario, and includes its successors and assignees;

20. "Compliance Protocol for Wind Turbine Noise" means the Ministry document entitled, Compliance Protocol for Wind Turbine Noise, Guideline for Acoustic Assessment and Measurement, PIBS# 8540e;

21. "Decibel" means a dimensionless measure of Sound Level or Sound Pressure Level, denoted as dB;

22. "Director" means a person appointed in writing by the Minister of the Environment pursuant to section 5 of the Act as a Director for the purposes of section 47.5 of the Act;

23. "District Manager" means the District Manager of the appropriate local district office of the Ministry where the Facility is geographically located;

24. "Equipment" means the wind turbine generators and the substation with transformer and reactor, identified in this Approval and as further described in the Application, to the extent approved by this Approval;

25. "Equivalent Sound Level" is the value of the constant sound level which would result in exposure to the same total A-weighted energy as would the specified time-varying sound, if the constant sound level persisted over an equal time interval. It is denoted L_{eq} and is measured in dB A-weighting (dBA);

26. "Facility" means the renewable energy generation facility, including the Equipment, as described in this Approval and as further described in the Application, to the extent approved by this Approval;

27. "IEEE Standard C57.12.90" means the IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers, 2010.

28. "Independent Acoustical Consultant" means an Acoustical Consultant who is not representing the Company and was not involved in preparing the Acoustic Assessment Report. The Independent Acoustical Consultant shall not be retained by the Acoustical Consultant involved in the noise impact assessment;

29. "Ministry" means the ministry of the government of Ontario responsible for the Act and includes all officials, employees or other persons acting on its behalf;

30. "Noise Guidelines for Wind Farms" means the Ministry document entitled, "Noise Guidelines for Wind Farms - Interpretation for Applying MOE NPC Publications to Wind Power Generation Facilities", dated October 2008;

31. "Noise Receptor" has the same meaning as in O. Reg. 359/09;

32. "Publication NPC-233" means Ministry Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October 1995;

33. "O. Reg. 359/09" means Ontario Regulation 359/09 "Renewable Energy Approvals under Part V.0.1 of the Act" made under the Act;

34. "Point of Reception" has the same meaning as in the Noise Guidelines for Wind Farms and is subject to the same qualifications described in that document;

35. "Sound Level" means the A-weighted Sound Pressure Level;

36. "Sound Level Limit" is the limiting value described in terms of the one hour A-weighted Equivalent Sound Level L_{eq};

37. "Sound Power Level" means ten times the logarithm to the base of 10 of the ratio of the sound power (Watts) of a noise source to standard reference power of 10^{-12} Watts;

38. "Sound Pressure" means the instantaneous difference between the actual pressure and the average or barometric pressure at a given location. The unit of measurement is the micro pascal (μPa);

39. "Sound Pressure Level" means twenty times the logarithm to the base 10 of the ratio of the effective pressure (μPa) of a sound to the reference pressure of 20 μPa;

40. "UTM" means Universal Transverse Mercator coordinate system.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

A – GENERAL

A1. The Company shall construct, install, use, operate, maintain and retire the Facility in accordance with the terms and conditions of this Approval and the Application and in accordance with the following schedules attached hereto:

Schedule A - Facility Description
Schedule B - Coordinates of the Equipment and Noise Specifications

A2. Where there is a conflict between a provision of this Approval and any document submitted by the Company, the conditions in this Approval shall take precedence. Where there is a conflict between one or more of the documents submitted by the Company, the document bearing the most recent date shall take precedence.

A3. The Company shall ensure a copy of this Approval is:

(1) accessible, at all times, by Company staff operating the Facility and;

(2) submitted to the clerk of each local municipality and upper-tier municipality in which the Facility is situated.

A4. If the Company has a publicly accessible website, the Company shall ensure that the Approval and the Application are posted on the Company's publicly accessible website within five (5) business days of receiving this Approval.

A5. The Company shall, at least six (6) months prior to the anticipated retirement date of the entire Facility, or part of the Facility, review its Decommissioning Plan Report to ensure that it is still accurate. If the Company determines that the Facility cannot be decommissioned in accordance with the Decommissioning Plan Report, the Company shall provide the Director and District Manager a written description of plans for the decommissioning of the Facility.

A6. The Facility shall be retired in accordance with the Decommissioning Plan Report and any directions provided by the Director or District Manager.

A7. The Company shall provide the District Manager and the Director at least ten (10) days written notice of the following:

(1) the commencement of any construction or installation activities at the project location; and

(2) the commencement of the operation of the Facility.

A8. As described in Schedule A of the Approval the Company shall not construct or operate more than forty (40) out of the forty eight (48) wind turbine generators, one transformer substation (with transformer and reactor), one switchyard, and one parts and storage building, as specified in Schedules A and B of the Approval;

B – EXPIRY OF APPROVAL

B1. Construction and installation of the Facility must be completed within three (3) years of the later of:

(1) the date this Approval is issued; or

(2) if there is a hearing or other litigation in respect of the issuance of this Approval, the date that this hearing or litigation is disposed of, including all appeals.

B2. This Approval ceases to apply in respect of any portion of the Facility not constructed or installed before the later of the dates identified in Condition B1.

C – NOISE PERFORMANCE LIMITS

C1. The Company shall ensure that:

(1) the Sound Levels from the Equipment, at the Points of Reception identified in the Acoustic Assessment Report, comply with the Sound Level Limits set in the Noise Guidelines for Wind Farms, as applicable, and specifically as stated in the table below:

Wind Speed (m/s) at 10 m height	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Sound Level Limits, dBA	40.0	40.0	40.0	43.0	45.0	49.0	51.0

(2) the Equipment is constructed and installed at either of the following locations:

a) at the locations identified in Schedule B of this Approval; or

b) at a location that does not vary by more than 10 metres from the locations identified in Schedule B of this Approval and provided that,

i) the Equipment will comply with Condition C1 (1); and

ii) all setback prohibitions established under O. Reg. 359/09 are complied with.

(3) the Equipment complies with the noise specifications set out in Schedule B of this Approval.

C2. Prior to construction and installation of the transformer substation the Company shall submit to the Director a written confirmation signed by an individual who has the authority to bind the Company that the subject transformer and the reactor sound power levels, determined fully in accordance with the IEEE Standard C57.12.90-2010, do not exceed the maximum sound power levels specified in the Schedule B of the Approval. The written confirmation also must include detailed electrical ratings (including MVA and kV) for the transformer and the reactor.

C3. If the Company determines that some or all of the Equipment cannot be constructed in accordance with Condition C1 (2), prior to the construction and installation of the Equipment in question, the Company shall apply to the Director for an amendment to the terms and conditions of the Approval.

C4. Within three (3) months of the completion of the construction of the Facility, the Company shall submit to the Director a written confirmation signed by an individual who has the authority to bind the Company that the UTM coordinates of the "as constructed" Equipment comply with the requirements of Condition C1 (2).

D – CONFIRMATION OF VACANT LOT NOISE RECEPTORS

D1. The four hundred and fifty eight (458) vacant lots location identified in the Table entitled "Grand Bend Wind Farm - Noise Impact Summary Table - Vacant Lots" from the final revised "Grand Bend Wind Farm - Environmental Noise Impact Assessment Report for the ", as the Non-Participating Vacant Lots with ID numbers VL1-VL458 are specified as Noise Receptors for the purposes of subsection 54 (1.1) of O. Reg. 359/09 and subsection 35 (1.01) of O. Reg. 359/09.

E – ACOUSTIC AUDIT - IMMISSION

E1. The Company shall carry out an Acoustic Audit - Immission of the Sound Levels produced by the operation of the Equipment in accordance with the following:

(1) the acoustic audit measurements shall be undertaken in accordance with Part D of the Compliance Protocol for Wind Turbine Noise;

(2) the acoustic audit measurements shall be performed by an Independent Acoustical Consultant on two (2) separate occasions at five (5) different Points of Reception;

(3) the Points of Reception shall be selected using the following criteria, subject to the constraints imposed by the location of the Points of Reception with respect to the location of the Equipment:

a) the selected Point(s) of Reception should represent the location of the greatest predicted noise impacts, i.e., the highest predicted Sound Levels; and

b) the selected Point(s) of Reception should be located in the direction of prevailing winds from the Facility.

E2. The Company shall submit to the District Manager and the Director an Acoustic Audit Report-Immission, prepared by an Independent Acoustical Consultant, at the following points in time:

(1) no later than twelve (12) months after the commencement of the operation of the Facility for the first of the two (2) acoustic audit measurements at the five (5) Points of Reception; and

(2) no later than eighteen (18) months after the commencement of the operation of the Facility for the second of the two (2) acoustic audit measurements at the five (5) Points of Reception.

E3. The Company shall carry out an Acoustic Audit - Transformer Substation/Transformer and Reactor and shall submit to the District Manager and the Director an Acoustic Audit Report – Transformer Substation/Transformer and Reactor prepared by an Independent Acoustical Consultant, in accordance with the IEEE Standard C57.12.90 and Ministry Publication NPC-233 and no later than six (6) months after the commencement of the operation of the Facility.

E.4. In addition to the requirements described in Condition E.3, the Acoustic Audit - Transformer Substation/Transformer and Reactor must include a compliance summary of the measurement results and the transformer and reactor sound data contained in Attachment D of the Acoustic Assessment Report. The following items must be included in the compliance summary**:**

(1) transformer sound power levels (overall level and frequency spectra in octave bands);

(2) reactor sound power levels (overall level and frequency spectra in octave bands); and

(3) statements that the transformer and the reactor sound power levels do not exceed the maximum sound power levels specified in the Schedule B of the Approval.

F – ACOUSTIC AUDIT- EMISSION

F1. The Company shall carry out an Acoustic Audit - Emission of the acoustic emissions produced by the operation of the wind turbine generators in accordance with the following:

(1) the acoustic emission measurements of the wind turbine generators shall be undertaken in accordance with the CAN/CSA Standard C61400-11-07;

(2) the acoustic emission measurements shall be performed by an Independent Acoustical Consultant; and

(3) the acoustic emission measurements shall be performed on two (2) wind turbine generators used in the Facility.

F2. The Company shall submit to the District Manager and the Director an Acoustic Audit Report-Emission, prepared in accordance with Section 9 of the CAN/CSA Standard C61400-11-07 by an Independent Acoustical Consultant, no later than six (6) months after the commencement of the operation of the Facility.

F3. In addition to the requirements described in Condition F2, the Acoustic Audit Report-Emission must include a summary of the measurement results corresponding to guarantee letter dated April 7, 2014 from the wind turbine generators manufacturer's (contained in the Attachment A of the Acoustic Assessment Report). The purpose of the summary is to show compliance with the guarantee letter. The following items must be included in the compliance summary:

(1) sound power levels (overall levels and frequency spectra in octave bands for each wind speed) of the wind turbine generators;

(2) tonal audibility values (for each wind speed) of the wind turbine generators;

(3) statement that the wind turbine generators sound power levels, as per Condition F3(1), do not exceed the maximum sound power level specified in the Schedule B of the Approval; and

(4) statement that the wind turbine generators tonal audibility values, as per Condition F3(2), comply with the maximum tonal audibility value of 3.0 dB.

G – STORMWATER MANAGEMENT

G1. The Company shall employ best management practices for stormwater management and sediment and erosion control during construction, installation, use, operation, maintenance and retiring of the Facility, as described in the Application.

G2. Sedimentation and erosion control measures, including, but not limited to, straw bales, silt fence barriers, sand bags, turbidity curtains and/or rock check dams, shall be installed at the site of all construction activities during the construction phase, and remain until the site has been stabilized. The sedimentation and erosion control measures shall be sufficient to control the volumes of surface runoff. Continuous care shall be taken to properly maintain the sedimentation and erosion control devices.

G3. During the construction and decommissioning phases, monitoring and recording of on-site conditions (including erosion and sediment control measures) shall occur, at minimum:

(1) weekly during active construction periods;

(2) daily during extended rain or snowmelt periods.

H – WATER TAKING ACTIVITIES

H1. The Company shall not take more than 50,000 litres of water on any day by any means during the construction, installation, use, operation, maintenance and retiring of the Facility.

H2. Notwithstanding Condition H1, the Company is authorized to take, via diversion of flow, from the sources, for the duration, and at the rates and amounts of taking specified in the following table. Water taken upstream of each source at the culvert work site shall be returned directly downstream of the site with no impoundment of water.

Source	Crossing ID	Maximum Rate of Taking (m3/s)	Maximum number of days of taking	Maximum Volume of Taking (m3/day)
Hay B (North Crossing)	CR-031	0.025	10	21,600
Hay B (South Crossing)	CR-032	0.017	13	19,094
Saint Joseph Drain South	CR-041	0.036	12	37,325
Hay E	CR-023	0.003	10	2,592
Kading Drain	CR-018	0.083	20	143,424

H3. For water taking for the purpose of watercourse diversion during the installation of the six new culverts, on each day water is taken, the Company shall record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter, or estimated based on the rate and duration of pumping. The Company shall keep all records required by this condition current and available at or near the site of the taking, and shall make these records available for review by the Ministry upon request.

H4. The Company shall ensure that any water discharged to the natural environment does not result in scouring, erosion or physical alteration of stream channels or banks and that there is no flooding in the receiving area or water body, downstream water bodies, ditches or properties caused or worsened by this discharge.

H5. The Company shall not discharge turbid water to any watercourse. Turbid water shall be defined as any discharge water or diverted water with a maximum increase of 5 NTUs above the receiving watercourse background levels.

I – ACCIDENTAL SPILLS

I1. The Company shall ensure that all equipment used at the site is well maintained, clean and free of leaks. Maintenance on construction equipment such as refuelling, oil changes or lubrication shall only be permitted in designated areas located at a minimum 30 metres from any water feature, and all precautions shall be made to prevent oil, grease, antifreeze or other materials from entering the ground or surface water flow.

I2. The Company shall ensure that adequate spill clean-up equipment and/or supplies are available at the site for fuel, oil and lubricant spills, and that all on-site operators are familiar with the use of such equipment and/or supplies.

J – SURFACE WATER

J1. Directional drilling entry points and receiving pits shall be located at a minimum distance of 15 metres from the top of bank of any watercourses, unless the 15 metre setback would require construction activities to take place outside the Project Location, or outside the shoulder of public roads. In the event that the 15 metre setback can not be achieved within the Project Location or in the shoulder of public roads, the Company shall implement additional site-specific erosion and sediment control measures including contingency measures to avoid impacts to watercourses.

J2. The Company shall undertake, as necessary, any other proposed mitigation measures for the water bodies described in the Water Assessment and Water Body Report, dated February 2013, prepared by Neegan Burnside Ltd.

K – SEWAGE WORKS OF THE TRANSFORMER SUBSTATION SPILL CONTAINMENT FACILITY

K1. The Company shall design and construct a transformer substation oil spill containment facility which meets the following requirements:

(1) the spill containment facility serving the transformer substation shall have a minimum volume equal to the volume of transformer oil and lubricants plus the volume equivalent to providing a minimum 24-hour duration, 50-year return storm capacity for the stormwater drainage area around the transformer under normal operating conditions. This containment area shall have:

(a) an impervious floor with walls usually of reinforced concrete or impervious plastic liners, sloped toward an outlet / oil control device, allowing for a freeboard of 0.25 metres terminating approximately 0.30 metres above grade to prevent external stormwater flows from entering the facility. The facility shall have a minimum of 300mm layer of crushed stoned (19mm to 38mm in diameter) within, all as needed in accordance to site specific conditions and final design parameters; or

(b) a permeable floor with impervious plastic walls and around the transformer pad; equipped with subsurface drainage with a minimum 50mm diameter drain installed on a sand layer sloped toward an outlet for sample collection purposes; designed with an oil absorbent material on floor and walls, and allowing for a freeboard of 0.25 metres terminating approximately 0.30 metres above grade to prevent external stormwater flows from entering the facility. The facility's berm shall be designed as needed in accordance to site specific conditions and the facility shall have a minimum 300mm layer of crushed stoned (19mm to 38mm in diameter) on top of the system, as needed in accordance to site specific conditions and final design parameters.

(2) the spill containment facility shall be equipped with an oil detection system; it also shall have a minimum of two (2) PVC pipes (or equivalent material) 50mm diameter to allow for visual inspection of water accumulation. One pipe has to be installed half way from the transformer pad to the vehicle access route;

(3) the spill containment facility shall have appropriate sewage appurtenances as necessary, such as but not limited to: sump, oil/grit separator, pumpout manhole, level controllers, floating oil sensors, etc., that allows for batch discharges or direct discharges and for proper implementation of the monitoring program described under Condition K4; and

(4) the Company shall have a qualified person on-site during construction to ensure that the system is installed in accordance with the approved design and specifications.

K2. The Company shall:

(1) within six (6) months after the completion of the construction of the transformer substation spill containment facility, provide to the District Manager an engineering report and as-built design drawings of the sewage works for the spill containment facility and any stormwater management works required for it, signed and stamped by an independent Professional Engineer licensed in Ontario and competent in electrical and environmental engineering. The engineering report shall include the following;

(a) as-built drawings of the sewage works for the spill containment facility and any stormwater management works required for it;

(b) a written report signed by a qualified person confirming the following:

(i) on-site supervision during construction
(ii) in case of a permeable floor systems: type of oil absorbent material used (for mineral-based transformer oil or vegetable-based transformer oil, make and material's specifications)
(ii) use of stormwater best management practices applied to prevent external surface water runoff from entering the spill containment facility, and
(iv) confirm adequacy of the installation in accordance with specifications.

(c) confirmation of the adequacy of the operating procedures and the emergency procedures manuals as it pertains to the installed sewage works.

(d) procedures to provide emergency response to the site in the form of pumping and clean-up equipment within 24 hours after an emergency has been identified. Such response shall be provided even under adverse weather conditions to prevent further danger of material loss to the environment.

(2) as a minimum, the Company shall check the oil detection systems on a monthly basis and create a written record of the inspections;

(3) ensure that the effluent is essentially free of floating and settle-able solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen or foam on the receiving waters;

(4) immediately identify and clean-up all losses of oil from the transformer;

(5) upon identification of oil in the spill containment facility, take immediate action to prevent the further occurrence of such loss;

(6) ensure that equipment and material for the containment, clean-up and disposal of oil and materials contaminated with oil are kept within easy access and in good repair for immediate use in the event of:

(a) loss of oil from the transformer,
(b) a spill within the meaning of Part X of the Act, or
(c) the identification of an abnormal amount of oil in the effluent.

(7) in the event of finding water accumulation in the PVC pipes at the time of inspection, as per Condition K4, the Company shall: (a) for impervious floors, inspect the sewage appurtenances that allow drainage of the concrete pit; or (b) for permeable systems, replace the oil absorbent material to ensure integrity of the system performance and design objectives.

(8) for permeable floor systems, the Company shall only use the type of oil specified in the design, i.e. mineral-based transformer oil or vegetable-based transformer oil. If a change is planned to modify the type of oil, the Company shall also change the type of the oil absorbent material and obtain approval from the Director to amend this Approval before any modification is implemented.

K3. The Company shall design, construct and operate the sewage works such that the concentration of the effluent parameter named in the table below does not exceed the maximum Concentration Objective shown for that parameter in the effluent, and shall comply with the following requirements:

Effluent Parameters	**Maximum Concentration Objective**
Oil and Grease	15mg/L

(1) notify the District Manager as soon as reasonably possible of any exceedance of the maximum concentration objective set out in the table above;

(2) take immediate action to identify the cause of the exceedance; and

(3) take immediate action to prevent further exceedances.

K4. Upon commencement of the operation of the Facility, the Company shall establish and carry out the following monitoring program for the sewage works:

(1) the Company shall collect and analyze the required set of samples at the sampling points listed in the table below in accordance with the measurement frequency and sample type specified for the effluent parameter, oil and grease, and create a written record of the monitoring:

Effluent Parameters	Measurement Frequency and Sample Points	Sample Type
Oil and Grease	Quarterly, i.e. four times over a year, relatively evenly spaced having a minimum two (2) of these samples taken within 48 hours after a 10mm rainfall event.	Grab

(2) in the event of an exceedance of the maximum concentration objective set out in the table in Condition K3, the Company shall:

(a) increase the frequency of sampling to once per month, for each month that effluent discharge occurs, and

(b) provide the District Manager, on a monthly basis, with copies of the written record created for the monitoring until the District Manager provides written direction that monthly sampling and reporting is no longer required; and

(3) if over a period of twenty-four (24) months of effluent monitoring under Condition K4, there are no exceedances of the maximum concentration set out in the table for Concentration Objective, the Company may reduce the measurement frequency of effluent monitoring to a frequency as the District Manager may specify in writing, provided that the new specified frequency is never less than annual.

K5. The Company shall comply with the following methods and protocols for any sampling, analysis and recording undertaken in accordance with Condition K4:

(1) Ministry of the Environment publication "Protocol for the Sampling and Analysis of Industrial/ Municipal Wastewater", January 1999, as amended from time to time by more recently published editions, and

(2) the publication "Standard Methods for the Examination of Water and Wastewater", 21st edition, 2005, as amended from time to time by more recently published editions.

L – NATURAL HERITAGE

General

L1. The Company shall implement the Environmental Effects Monitoring Plan for the Grand Bend Wind Farm, titled Grand Bend Wind Farm Natural Heritage Environmental Effects Monitoring Plan, dated January 2013, and the commitments made in the Grand Bend Wind Farm Natural Heritage Assessment, dated January 2013 prepared by Neegan Burnside Ltd., and included in the application, and which the Company submitted to the Ministry of Natural Resources in order to comply with O. Reg. 359/09.

L2. If the Company determines that it must deviate from the Environmental Effects Monitoring Plan or the Natural Heritage Assessment, described in Condition L1, the Company shall contact the Director and the Ministry of Natural Resources, prior to making any changes to the Environmental Effects Monitoring Plan or the Natural Heritage Assessment, and follow any directions provided.

Post Construction Monitoring - Significant Wildlife Habitat

L3. The Company shall implement the post-construction monitoring described in the Environmental Effects Monitoring Plan described in Condition L1, including the following:

(1) Disturbance Monitoring for Amphibian Breeding Habitat (ABH-001)

(2) Disturbance Monitoring for Turtle Nesting Area (TNA-002)

Post Construction Monitoring - Birds and Bats

L4. The Company shall implement the post-construction bird and bat mortality monitoring described in the Environmental Effects Monitoring Plan, described in Condition L1, at a minimum of 12 of the 40 constructed turbines, selected in consultation with the Ministry of Natural Resources. Turbines 17, 18 and 42 must be included on the list of monitored turbines.

Thresholds and Mitigation

L5. The Company shall contact the Director and the Ministry of Natural Resources if any of the following bird and bat mortality thresholds, as stated in the Environmental Effects Monitoring Plan for the Grand Bend Wind Farm described in Condition L1, exceeds:

(1) 10 bats per turbine per year averaged across the Facility;

(2) 14 birds per turbine per year at individual turbines or turbine groups;

(3) 0.2 raptors per turbine per year (all raptors) across the Facility;

(4) 0.1 raptors per turbine per year (provincially tracked raptors) across the Facility;

(5) 10 or more birds at any one turbine during a single monitoring survey; or

(6) 33 or more birds (including raptors) at multiple turbines during a single monitoring survey.

L6. If the bat mortality threshold described in Condition L5(1) is exceeded, the Company shall:

(1) implement operational mitigation measures consistent with those described in the Ministry of Natural Resources publication entitled "*Bats and Bat Habitats: Guidelines for Wind Power Projects* " dated July 2011, or in an amended version of the publication. Such measures shall include some or all of the following:

i. increase cut-in speed to 5.5 m/s and/or feather wind turbine blades when wind speeds are below 5.5 m/s between sunset and sunrise, from July 15 to September 30 at all turbines;

(2) implement an additional three (3) years of effectiveness monitoring.

L7. If the bat mortality threshold described in Condition L5(1) is exceeded after operational mitigation is implemented in accordance with Condition L6, the Company shall prepare and implement a contingency plan, in consultation with the Director and the Ministry of Natural Resources, to address mitigation actions which shall include additional mitigation and scoped monitoring requirements.

L8. If any of the bird mortality thresholds described in Conditions L5(2), L5(3), or L5(4) are exceeded for turbines located outside 120m of bird significant wildlife habitat, the Company shall conduct two (2) years of subsequent scoped mortality monitoring and cause and effects monitoring. Following the completion of scoped monitoring, the Company shall implement operational mitigation and effectiveness monitoring at individual turbines as agreed to between the Company, the Director and the Ministry of Natural Resources, for the first three (3) years following the implementation of mitigation.

L9. If either of the bird mortality thresholds described in Conditions L5(5) or L5(6) are exceeded, the Company shall prepare and implement a contingency plan to address immediate mitigation actions which shall include:

(1) periodic shut-down of select turbines; or

(2) blade feathering at specific times of year; or

(3) an alternate plan agreed to between the Company, the Director, and the Ministry of Natural Resources.

L10. If any of the bird mortality thresholds described in Conditions L5(2), L5(3), or L5(4) are exceeded while monitoring is being implemented in accordance with Conditions L8, or if either of the bird mortality thresholds described in Conditions L5(5) or L5(6) are exceeded after mitigation is implemented in accordance with Condition L9, the Company shall contact the Director and the Ministry of Natural Resources and prepare and implement an appropriate response plan that shall include some or all of the following mitigation measures:

(1) increased reporting frequency to identify potential threshold exceedance;

(2) additional behavioural studies to determine factors affecting mortality rates;

(3) periodic shut-down of select turbines;

(4) blade feathering at specific times of year; or

(5) an alternate plan agreed to between the Company, the Director and the Ministry of Natural Resources.

Reporting and Review of Results

L11. The Company shall report, in writing, the results of the post-construction disturbance monitoring described in Conditions L3, to the Director and the Ministry of Natural Resources for two (2) years on an annual basis and within three (3) months of the end of each calendar year in which the monitoring took place.

L12. The Company shall report, in writing, bird and bat mortality levels to the Director and the Ministry of Natural Resources for three (3) years on an annual basis and within three (3) months of the conclusion of the November mortality monitoring, with the exception of the following:

(1) if either of the bird mortality thresholds described in Conditions L5(5) or L5(6) are exceeded, the Company shall report the mortality event to the Director and the Ministry of Natural Resources within 48 hours of observation;

(2) for any and all mortality of species at risk (including a species listed on the Species at Risk in Ontario list as Extirpated, Endangered or Threatened under the provincial *Endangered Species Act,* 2007) that occurs, the Company shall report the mortality to the Ministry of Natural Resources within 24 hours of observation or the next business day;

(3) if the bat mortality threshold described in Condition L5(1) is exceeded, the Company shall report mortality levels to the Director and the Ministry of Natural Resources for the additional three (3) years of monitoring described in Condition L6, on an annual basis and within three (3) months of the conclusion of the October mortality monitoring for each year;

(4) if any of the bird mortality thresholds described in Conditions L5(2), L5(3), or L5(4) are exceeded for turbines located outside 120 m of bird significant wildlife habitat, the Company shall report mortality levels to the Director and the Ministry of Natural Resources for the additional two (2) years of cause and effects monitoring described in Condition L8, on an annual basis and within three (3) months of the conclusion of the November mortality monitoring for each year; and

(5) if the Company implements operational mitigation following cause and effects monitoring in accordance with Condition L8, the Company shall report mortality levels to the Director and the Ministry of Natural Resources for the three (3) years of subsequent effectiveness monitoring described in Condition L8, on an annual basis and within three (3) months of the conclusion of the November mortality monitoring for each year.

L13. The Company shall publish the following documents on the Company's website;

(1) any modifications to the Environmental Effects Monitoring Plan as described in Condition L2 within ten (10) days of submitting the final plan to the Director and the Ministry of Natural Resources;

(2) the results of the post-construction disturbance monitoring as described in Condition L11 within ten (10) days of submitting the final report(s) to the Director and the Ministry of Natural Resources; and

(3) annual bird and bat mortality monitoring as described in Condition L12 with the exception of subsection L12(2), within ten (10) days of submitting the final report(s) to the Director and the Ministry of Natural Resources.

M – ENVIRONMENT CANADA

M1. Prior to operating (turbine blade movement that is feathered in accordance with the manufacturer's specifications is allowed) any of the wind turbines at the Facility, the Company shall, in collaboration with Environment Canada, develop and, enter into the following:

(1) an Exceptional Weather Event Protocol that ensures that the Exeter Radar Station (Weather Radar) continues to provide accurate and reliable forecasts and weather warnings for high risk weather events;

(2) a Follow-up Plan; and

(3) an Adaptive Management Strategy.

M2. Prior to operating (turbine blade movement that is feathered in accordance with the manufacturer's specifications is allowed) any of the wind turbines at the Facility, the Company shall enter into an Agreement Regarding the Implementation of the Follow-up Plan, the Adaptive Management Strategy and the Exceptional Weather Event Protocol (Agreement) with Environment Canada that will set out the details of the commitments and timelines required for the Exceptional Weather Event Protocol, Follow-up Plan, and Adaptive Management Strategy. The Agreement shall include specifics of the financial assurance to be provided by the Company to ensure the implementation of the agreement.

M3. The day the first wind turbine is operating (turbine blade movement that is feathered in accordance with the manufacturer's specifications is allowed) at the Facility, the Company shall begin implementing its obligations under the Exceptional Weather Event Protocol and Follow-up Plan described in Condition M1.

M4. As part of the Follow-Up Plan, the Company shall, in collaboration with Environment Canada:

(1) develop the measureable objectives and decision making criteria for defining the success of the plan;

(2) provide for the development, and subsequently the implementation, of the data interpolation mitigation measure agreed to by the Company and Environment Canada;

(3) verify the accuracy of the predicted adverse impacts to the Weather Radar resulting from the commercial operation of the Facility;

(4) assess the effectiveness of the data interpolation measure(s) to mitigate the predicted adverse impacts during the commercial operation of the Facility; and

(5) monitor the effectiveness of the Weather Radar in order to determine whether any additional mitigation measures are necessary.

M5. During the implementation of the Follow-Up Plan, should it be determined based on the Follow-Up Plan that the data interpolation mitigation measure(s) do not adequately mitigate the adverse impacts of the Facility so that the Weather Radar can continue to provide accurate and reliable forecasts and weather warnings in accordance with Environment Canada's mandate, the Company shall, in collaboration with Environment Canada, implement the Adaptive Management Strategy, which shall include the following:

(1) the design and implementation of additional mitigation measures that are reasonably necessary to mitigate any identified adverse impacts to the Weather Radar; and

(2) the monitoring and assessment of the effectiveness of these additional mitigation measures.

N – ABORIGINAL CONSULTATION

N1. During the construction, installation, operation, use and retiring of the Facility, the Company shall:

(1) create and maintain written records of any communications with Aboriginal communities; and

(2) make the written records available for review by the Ministry upon request.

N2. The Company shall provide the following to interested Aboriginal communities:

(1) updated project information, including the results of monitoring activities undertaken and copies of additional archaeological assessment reports that may be prepared; and;

(2) updates on key steps in the construction, installation, operation, use and retirement phases of the Facility, including notice of the commencement of construction activities at the project location.

N3. If an Aboriginal community requests a meeting to obtain information relating to the construction, installation, operation, use and retiring of the Facility, the Company shall make reasonable efforts to arrange and participate in such a meeting.

N4. If any archaeological resources of Aboriginal origin are found during the construction of the Facility, the Company shall:

(1) notify any Aboriginal community considered likely to be interested or which has expressed an interest in such finds; and,

(2) if a meeting is requested by an Aboriginal community to discuss the archaeological find(s), make reasonable efforts to arrange and participate in such a meeting.

O – ARCHAEOLOGICAL RESOURCES

O1. The Company shall implement all of the recommendations, if any, for further archaeological fieldwork and for the protection of archaeological sites found in the consultant archaeologist's report included in the Application, and which the Company submitted to the Ministry of Tourism, Culture and Sport in order to comply with O. Reg. 359/09.

O2. Should any previously undocumented archaeological resources be discovered, the Company shall:

(1) cease all alteration of the area in which the resources were discovered immediately;

(2) engage a consultant archaeologist to carry out the archaeological fieldwork necessary to further assess the area and to either protect and avoid or excavate any sites in the area in accordance with the *Ontario Heritage Act* , the regulations under that act and the Ministry of Tourism, Culture and Sport's *Standards and Guidelines for Consultant Archaeologists* ; and

(3) notify the Director as soon as reasonably possible.

P – COMMUNITY LIAISON COMMITTEE

P1. Within three (3) months of receiving this Approval, the Company shall make reasonable efforts to establish a Community Liaison Committee. The Community Liaison Committee shall be a forum to exchange ideas and share concerns with interested residents and members of the public. The Community Liaison Committee shall be established by:

(1) publishing a notice in a newspaper with general circulation in each local municipality in which the project location is situated; and

(2) posting a notice on the Company's publicly accessible website, if the Company has a website;

to notify members of the public about the proposal for a Community Liaison Committee and invite residents living within a one (1) kilometre radius of the Facility that may have an interest in the Facility to participate on the Community Liaison Committee.

P2. The Company may invite other members of stakeholders to participate in the Community Liaison Committee, including, but not limited to, local municipalities, local conservation authorities, Aboriginal communities, federal or provincial agencies, and local community groups.

P3. The Community Liaison Committee shall consist of at least one Company representative who shall attend all meetings.

P4. The purpose of the Community Liaison Committee shall be to:

(1) act as a liaison facilitating two way communications between the Company and members of the public with respect to issues relating to the construction, installation, use, operation, maintenance and retirement of the Facility;

(2) provide a forum for the Company to provide regular updates on, and to discuss issues or concerns relating to, the construction, installation, use, operation, maintenance and retirement of the Facility with members of the public; and

(3) ensure that any issues or concerns resulting from the construction, installation, use, operation, maintenance and retirement of the Facility are discussed and communicated to the Company.

P5. The Community Liaison Committee shall be deemed to be established on the day the Director is provided with written notice from the Company that representative Community Liaison Committee members have been chosen and a date for a first Community Liaison Committee meeting has been set.

P6. If a Community Liaison Committee has not been established within three (3) months of receiving this Approval, the Company shall provide a written explanation to the Director as to why this has not occurred.

P7. The Company shall ensure that the Community Liaison Committee operates for a minimum period of two (2) years from the day it is established. During this two (2) year period, the Company shall ensure that the Community Liaison Committee meets a minimum of two (2) times per year. At the end of this two (2) year period, the Company shall contact the Director to discuss the continued operation of the Community Liaison Committee.

P8. The Company shall ensure that all Community Liaison Committee meetings are open to the general public.

P9. The Company shall provide administrative support for the Community Liaison Committee including, at a minimum:

(1) providing a meeting space for Community Liaison Committee meetings;

(2) providing access to resources, such as a photocopier, stationery, and office supplies, so that the Community Liaison Committee can:

a) prepare and distribute meeting notices;

b) record and distribute minutes of each meeting; and

c) prepare reports about the Community Liaison Committee's activities.

P10. The Company shall submit any reports of the Community Liaison Committee to the Director and post it on the Company's publicly accessible website, if the Company has a website.

Q – OPERATION AND MAINTENANCE

Q1. Prior to the commencement of the operation of the Facility, the Company shall prepare a written manual for use by Company staff outlining the operating procedures and a maintenance program for the Equipment that includes as a minimum the following:

(1) routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment suppliers;

(2) emergency procedures;

(3) procedures for any record keeping activities relating to operation and maintenance of the Equipment; and

(4) all appropriate measures to minimize noise emissions from the Equipment.

Q2. The Company shall;

(1) update, as required, the manual described in Condition Q1; and
(2) make the manual described in Condition Q1 available for review by the Ministry upon request.

Q3. The Company shall ensure that the Facility is operated and maintained in accordance with the Approval and the manual described in Condition Q1.

R – RECORD CREATION AND RETENTION

R1. The Company shall create written records consisting of the following:

(1) an operations log summarizing the operation and maintenance activities of the Facility;

(2) within the operations log, a summary of routine and Ministry inspections of the Facility; and

(3) a record of any complaint alleging an Adverse Effect caused by the construction, installation, use, operation, maintenance or retirement of the Facility.

R2. A record described under Condition R1 (3) shall include:

(1) a description of the complaint that includes as a minimum the following:

a) the date and time the complaint was made;

b) the name, address and contact information of the person who submitted the complaint;

(2) a description of each incident to which the complaint relates that includes as a minimum the following:

a) the date and time of each incident;

b) the duration of each incident;

c) the wind speed and wind direction at the time of each incident;

d) the ID of the Equipment involved in each incident and its output at the time of each incident;

e) the location of the person who submitted the complaint at the time of each incident; and

(3) a description of the measures taken to address the cause of each incident to which the complaint relates and to prevent a similar occurrence in the future.

R3. The Company shall retain, for a minimum of five (5) years from the date of their creation, all records described in Condition R1, and make these records available for review by the Ministry upon request.

S – NOTIFICATION OF COMPLAINTS

S1. The Company shall notify the District Manager of each complaint within two (2) business days of the receipt of the complaint.

S2. The Company shall provide the District Manager with the written records created under Condition R2 within eight (8) business days of the receipt of the complaint.

T – CHANGE OF OWNERSHIP

T1. The Company shall notify the Director in writing, and forward a copy of the notification to the District Manager, within thirty (30) days of the occurrence of any of the following changes:

(1) the ownership of the Facility;

(2) the operator of the Facility;

(3) the address of the Company;

(4) the partners, where the Company is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act* , R.S.O. 1990, c.B.17, as amended, shall be included in the notification; and

(5) the name of the corporation where the Company is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act* , R.S.O. 1990, c. C.39, as amended, shall be included in the notification.

U – TRAFFIC MANAGEMENT PLANNING

U1. Within three (3) months of receiving this Approval, the Company shall prepare a Traffic Management Plan and provide it to the Municipality of Bluewater, Municipality of South Huron, Municipality of Huron East, Municipality of West Perth, Huron County, and Perth County.

U2. Within three (3) months of having provided the Traffic Management Plan to the Municipality of Bluewater, Municipality of South Huron, Municipality of Huron East, Municipality of West Perth, Huron County, and Perth County, the Company shall make reasonable efforts to enter into a Road Users Agreement with the Municipality of Bluewater, Municipality of South Huron, Municipality of Huron East, Municipality of West Perth, Huron County, and Perth County.

U3. If a Road Users Agreement has not been signed with the Municipality of Bluewater, Municipality of South Huron, Municipality of Huron East, Municipality of West Perth, Huron County, and Perth County within three (3) months of having provided the Traffic Management Plan to the Municipality of Bluewater, Municipality of South Huron, Municipality of Huron East, Municipality of West Perth, Huron County, and Perth County, the Company shall provide a written explanation to the Director as to why this has not occurred.

SCHEDULE A

Facility Description

The Facility shall consist of the construction, installation, operation, use and retiring of the following equipment:

(a) a total of forty (40) out of forty eight (48) Siemens SWT-3.0-113 wind turbine generators each rated at 2.483 megawatts generating output capacity, as specified in the Acoustic Assessment Report;

with a total name plate capacity of up to approximately 100 megawatts, designated as source ID Nos. T-01 to T-48, each with a hub height of 99.5 metres above grade, and sited at the locations shown in Schedule B;

(b) one (1) transformer substation including one (1) transformer and one (1) reactor and sited at the location shown in Schedule B;

(c) one (1) switchyard as shown in Figure 2s of the Project Description Report, dated February 2013, prepared by Neegan Burnside Ltd.

(d) one (1) parts and storage building as shown in Figure 2e of the Project Description Report, dated February 2013, prepared by Neegan Burnside Ltd.

(e) associated ancillary equipment, systems and technologies including on-site access roads, underground cabling and underground transmission line,

all in accordance with the Application.

SCHEDULE B
Coordinates of the Equipment and Noise Specifications

Coordinates of the Equipment are listed below in UTM, Z17-NAD83 projection:

Table B1: Coordinates and Maximum Sound Power Levels of Wind Turbine Generators and Transformer Substation/Transformer and Reactor

Source ID	Sound Power Level (dBA)	Easting (m)	Northing (m)	Source description
T-01	**101.5***	444036	4811878	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-02	**101.5***	444376	4811760	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-03	**101.5***	445882	4810067	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-04	**101.5***	443802	4810148	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-05	**101.5***	444206	4809869	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-06	**101.5***	444035	4809533	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-07	**101.5***	443954	4809148	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-08	**101.5***	443718	4808841	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-09	**101.5***	444323	4808855	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-10	**101.5***	444002	4808745	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-11	**101.5***	444330	4808461	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-12	**101.5***	444001	4808315	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-13	**101.5***	444228	4808041	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-14	**101.5***	443802	4807902	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-15	**101.5***	444500	4807773	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-16	**101.5***	443896	4807611	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-17	**101.5***	443377	4805355	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-18	**101.5***	443717	4805337	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-19	**101.5***	446261	4804829	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-20	**101.5***	446913	4804825	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-21	**101.5***	443654	4804592	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-22	**101.5***	443974	4804635	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-23	**101.5***	443320	4804184	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-24	**101.5***	443623	4804057	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-25	**101.5***	443997	4804036	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-26	**101.5***	443339	4803814	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-27	**101.5***	443638	4803681	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-28	**101.5***	443409	4803439	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-29	**101.5***	443154	4802383	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m

Table B1: Coordinates and Maximum Sound Power Levels of Wind Turbine Generators and Transformer Substation/Transformer and Reactor (continued)

Source ID	Sound Power Level (dBA)	Easting (m)	Northing (m)	Source description
T-30	**101.5***	443011	4802014	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-31	**101.5***	443540	4801110	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-32	**101.5***	442448	4800448	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-33	**101.5***	442838	4800465	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-34	**101.5***	442243	4800119	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-35	**101.5***	442757	4800013	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-36	**101.5***	442447	4799830	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-37	**101.5***	442062	4799669	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-38	**101.5***	442409	4799492	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-39	**101.5***	441744	4799389	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-40	**101.5***	441527	4798742	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-41	**101.5***	441764	4798145	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-42	**101.5***	441607	4797851	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-43	**101.5***	442249	4797830	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-44	**101.5***	441123	4797225	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-45	**101.5***	440154	4796958	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-46	**101.5***	440550	4796892	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-47	**101.5***	440850	4796687	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
T-48	**101.5***	440529	4796554	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
R	**100.2****	446784	4804831	Reactor
TS	**96.1****	446772	4804794	Transformer

NOTE: * Wind turbine generators Sound Power Levels reported above are identified in the guarantee letter prepared by Siemens, dated April 7, 2014.

** The Sound Power Levels reported above for the Transformer and Reactor include the 5 Decibels (dB) adjustment for tonality as prescribed in Publication NPC-104.

Table B2: Maximum Sound Power Spectrums (dBA and dB Lin) for the transformer and the reactor

Transformer Substation	Octave Band Centre Frequency (Hz)								Overall
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
Lw (dBA) for the transformer	72.5	84.6	87.1	92.5	89.7	85.9	80.7	71.6	96.1
Lw (dB) for the transformer	98.7	100.7	95.7	95.7	89.7	84.7	79.7	72.7	105.5
Lw (dBA) for the reactor	70.0	81.0	96.0	98.0	65.0	60.0	55.0	50.0	100.2
Lw (dB) for the reactor	96.2	97.1	104.6	101.2	65.0	58.8	54.0	51.1	107.1

Note: The Transformer and Reactor Sound Power Level values above include the 5 decibel (dB) adjustment for tonality as prescribed in Publication NPC-104.

The reasons for the imposition of these terms and conditions are as follows:

1. Conditions A1, A2 and A8 are included to ensure that the Facility is constructed, installed, used, operated, maintained and retired in the manner in which it was described for review and upon which Approval was granted. These conditions are also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Conditions A3 and A4 are included to require the Company to provide information to the public and the local municipality.

3. Conditions A5 and A6 are included to ensure that final retirement of the Facility is completed in an aesthetically pleasing manner, in accordance with Ministry standards, and to ensure long-term protection of the health and safety of the public and the environment.

4. Condition A7 is included to require the Company to inform the Ministry of the commencement of activities related to the construction, installation and operation of the Facility.

5. Condition B is intended to limit the time period of the Approval.

6. Conditions C1 and C2 are included to provide the minimum performance requirement considered necessary to prevent an Adverse Effect resulting from the operation of the Equipment and to ensure that the noise emissions from the Equipment will be in compliance with applicable limits set in the Noise Guidelines for Wind Farms.

7. Conditions C3, C4 and D are included to ensure that the Equipment is constructed, installed, used, operated, maintained and retired in a way that meets the regulatory setback prohibitions set out in O. Reg. 359/09.

8. Conditions E and F are included to require the Company to gather accurate information so that the environmental noise impact and subsequent compliance with the Act, O. Reg. 359/09, the Noise Guidelines for Wind Farms and this Approval can be verified.

9. Conditions G, H, I J, K, L and U are included to ensure that the Facility is constructed, installed, used, operated, maintained and retired in a way that does not result in an Adverse Effect or hazard to the natural environment or any persons.

10. Condition M is included to ensure that Environment Canada's Exeter Radar Station can continue to be used to provide accurate and reliable forecasts and weather warnings consistent with Environment Canada's mandate.

11. Condition O is included to protect archaeological resources that may be found at the project location.

12. Condition N is included to ensure continued communication between the Company and interested Aboriginal communities.

13. Condition P is included to ensure continued communication between the Company and the local residents.

14. Condition Q is included to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the Act, O. Reg. 359/09 and this Approval.

15. Condition R is included to require the Company to keep records and provide information to the Ministry so that compliance with the Act, O. Reg. 359/09 and this Approval can be verified.

16. Condition S is included to ensure that any complaints regarding the construction, installation, use, operation, maintenance or retirement of the Facility are responded to in a timely and efficient manner.

17. Condition T is included to ensure that the Facility is operated under the corporate name which appears on the application form submitted for this Approval and to ensure that the Director is informed of any changes.

NOTICE REGARDING HEARINGS

In accordance with Section 139 of the Environmental Protection Act, within 15 days after the service of this notice, you may by further written notice served upon the Director, the Environmental Review Tribunal and the Environmental Commissioner, require a hearing by the Tribunal.

In accordance with Section 47 of the Environmental Bill of Rights, 1993, the Environmental Commissioner will place notice of your request for a hearing on the Environmental Registry.

Section 142 of the Environmental Protection Act provides that the notice requiring the hearing shall state:

1. The portions of the renewable energy approval or each term or condition in the renewable energy approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The signed and dated notice requiring the hearing should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The renewable energy approval number;
6. The date of the renewable energy approval;
7. The name of the Director;
8. The municipality or municipalities within which the project is to be engaged in;

This notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Environmental Commissioner
1075 Bay Street, 6th Floor
Suite 605
Toronto, Ontario
M5S 2B1

AND

The Director
Section 47.5, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

Under Section 142.1 of the Environmental Protection Act, residents of Ontario may require a hearing by the Environmental Review Tribunal within 15 days after the day on which notice of this decision is published in the Environmental Registry. By accessing the Environmental Registry at www.ebr.gov.on.ca , you can determine when this period ends.

Approval for the above noted renewable energy project is issued to you under Section 47.5 of the Environmental Protection Act subject to the terms and conditions outlined above.

DATED AT TORONTO this 26th day of June, 2014

Vic Schroter, P.Eng.
Director
Section 47.5, *Environmental Protection Act*

NC/
c: District Manager, MOE Owen Sound
Gordon Potts, Northland Power Inc.

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO RENEWABLE ENERGY APPROVAL

NUMBER 5186-9HBJXR
Issue Date: March 24, 2015

Grand Bend Wind Limited Partership by its general partners Grand Bend Wind GP Inc.
30 St. Clair Avenue West, No. 1700
Toronto, Ontario
M4V 3A1

Site Location: Grand Bend Wind Farm
Generally bound by Lake Huron to west, Main Street/Grand Bend Line to the south, Bronson Line to east, Staffa Road to north, and a transmission line along Sararas Road, Rodgerville Road, and Road 183.
Municipality of Bluewater, Municipality of South Huron, Municipality of Huron East, Municipality of West Perth, Huron County, and Perth County

You are hereby notified that I have amended Approval No. 5186-9HBJXR issued on June 26, 2014 for Class 4 wind facility , as follows:

The definition of the "Application" is deleted and replaced with the following:

11. "Application" means the application for a Renewable Energy Approval dated February 5, 2013, and signed by John Brace, President and CEO, Grand Bend Wind GP Inc., and all supporting documentation submitted with the application, including amended documentation submitted up to June 26, 2014; and as further amended by the application for an amendment to a Renewable Energy Approval dated October 22, 2014, and signed by Jim Mulvale, Manager, Environment, Health & Safety, Grand Bend Wind Limited Partnership by its general partner Grand Bend Wind GP Inc., and all supporting documentation submitted with the application, including amended documentation submitted up to February 18, 2015.

Condition J2 is deleted and replaced with the following:

J2: The Company shall undertake, as necessary, any other proposed mitigation measures and best management practices for the protection of water bodies, as described in the Water Assessment and Water Body Report, dated February 2013, prepared by Neegan Burnside Ltd., and the Erosion and Sedimentation Control (ESC) documentation submitted by Northland Power Inc. to the Ministry on January 27, 2015.

All other Terms and Conditions of the Approval remain the same.

This Notice shall constitute part of the approval issued under Approval No. 5186-9HBJXR dated June 26, 2014

In accordance with Section 139 of the Environmental Protection Act, within 15 days after the service of this notice, you may by further written notice served upon the Director, the Environmental Review Tribunal and the Environmental Commissioner, require a hearing by the Tribunal.

In accordance with Section 47 of the Environmental Bill of Rights, 1993, the Environmental Commissioner will place notice of your request for a hearing on the Environmental Registry.

Section 142 of the Environmental Protection Act provides that the notice requiring the hearing shall state:

1. The portions of the renewable energy approval or each term or condition in the renewable energy approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The signed and dated notice requiring the hearing should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The renewable energy approval number;
6. The date of the renewable energy approval;
7. The name of the Director;
8. The municipality or municipalities within which the project is to be engaged in;

This notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Environmental Commissioner
1075 Bay Street, 6th Floor
Suite 605
Toronto, Ontario
M5S 2B1

AND

The Director
Section 47.5, *Environmental Protection Act*
Ministry of the Environment and Climate Change
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

Under Section 142.1 of the Environmental Protection Act, residents of Ontario may require a hearing by the Environmental Review Tribunal within 15 days after the day on which notice of this decision is published in the Environmental Registry. By accessing the Environmental Registry at www.ebr.gov.on.ca , you can determine when this period ends.

Approval for the above noted renewable energy project is issued to you under Section 47.5 of the

Environmental Protection Act subject to the terms and conditions outlined above.
DATED AT TORONTO this 24th day of March, 2015

Mohsen Keyvani, P.Eng.
Director
Section 47.5, *Environmental Protection Act*

YB/
c: District Manager, MOECC Owen Sound
Jim Mulvale, Northland Power inc.

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO RENEWABLE ENERGY APPROVAL

NUMBER 5186-9HBJXR
Issue Date: July 18, 2017

Grand Bend Wind GP Inc., as general partner for and on behalf of Grand Bend Wind Limited Partnership
30 St. Clair Ave W, No. 1700
Toronto, Ontario
M4V 3A1

Site Location: Grand Bend Wind Farm
Grand Bend Line Lake Huron to west, Main Street to south, Bronson Line to east, Staffa Road to north
Bluewater Municipality, County of Huron
N0M 0A0

You are hereby notified that I have amended Approval No. 5186-9HBJXR issued on June 26, 2014 for forty(40) 2.483 megawatts wind turbines and a transformer substation , as follows:

(A) The definition of "Application" is deleted and replaced with the following:.

11. "Application" means the application for a Renewable Energy Approval dated February 5, 2013, and signed by John Brace, President and CEO, Grand Bend Wind GP., and all supporting documentation submitted with the application including amended documentation submitted up to June 26, 2014; and as further amended by the application for an amendment to a Renewable Energy Approval dated October 22, 2014,Feb 18, 2015; and as further amended by the application for an amendment to a Renewable Energy Approval dated April 13, 2017, and signed by Jim Mulvale, Manager, Environment, Health & Safety, Grand Bend Wind Limited Partnership by its general partner Grand Bend Wind GP Inc., and all supporting documentation submitted with the application, including amended documentation submitted up to July 10, 2017.

(B) To account for the inclusion of a three phase 40 MVAR reactor unit (comprised of three reactors) and for updated sound level (reduction) data for the existing transformer substation and the existing reactor unit.

Consequently the following items in the Approval are amended as follows:

i) **Definition one (1); " Acoustic Assessment Report",** is modified as noted below to include updated reports:

Acoustic Assessment Report" means the reports entitled:

1. "Grand Bend Wind Farm - Environmental Noise Impact Assessment Report", dated April 15, 2014 signed Michael Medal and Payam Ashtiani, Aercoustics Engineering Limited; and

2. "Assessment Report - Project 11167.00,Grand Bend Wind Farm, Grand Bend, Ontario" dated July 7, 2017 signed by Kohl Clark and Michael Medal, Aercoustics Engineering Limited.

ii) **Sections "b" of Schedule A** of the Approval is modified as noted below:

The Facility shall consist of the construction, installation, operation, use and retiring of the following equipment:

(b) one (1) transformer substation including one (1) transformer and four (4) reactors sited at the location as shown in Schedule B;

iii) **Table B1 of Schedule B** of the Approval is modified as noted below:

Table B1: Coordinates and Maximum Sound Power Levels of Wind Turbine Generators
and
Transformer Substation/Transformer and Reactor Units

#	Source ID	Sound Power Level (dBA)	Easting (m)	Northing (m)	Source Description
1	T-01	101.5*	444,036	4,811,878	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
2	T-02	101.5*	444,376	4,811,760	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
3	T-03	101.5*	445,882	4,810,067	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
4^	T-04	101.5*	443,802	4,810,148	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
5	T-05	101.5*	444,206	4,809,869	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
6	T-06	101.5*	444,035	4,809,533	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m

#	Source ID	Sound Power Level (dBA)	Easting (m)	Northing (m)	Source Description
7	T-07	101.5*	443,954	4,809,148	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
8	T-08	101.5*	443,718	4,808,841	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
9	T-09	101.5*	444,323	4,808,855	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
10^	T-10	101.5*	444,002	4,808,745	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
11	T-11	101.5*	444,330	4,808,461	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
12	T-12	101.5*	444,001	4,808,315	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
13	T-13	101.5*	444,228	4,808,041	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
14	T-14	101.5*	443,802	4,807,902	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
15^	T-15	101.5*	444,500	4,807,773	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
16	T-16	101.5*	443,896	4,807,611	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
17	T-17	101.5*	443,377	4,805,355	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
18	T-18	101.5*	443,717	4,805,337	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
19	T-19	101.5*	446,261	4,804,829	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
20	T-20	101.5*	446,913	4,804,825	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
21	T-21	101.5*	443,654	4,804,592	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
22	T-22	101.5*	443,974	4,804,635	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
23	T-23	101.5*	443,320	4,804,184	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
24^	T-24	101.5*	443,623	4,804,057	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
25	T-25	101.5*	443,997	4,804,036	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
26	T-26	101.5*	443,339	4,803,814	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
27	T-27	101.5*	443,638	4,803,681	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m

#	Source ID	Sound Power Level (dBA)	Easting (m)	Northing (m)	Source Description
28^	T-28	101.5*	443,409	4,803,439	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
29	T-29	101.5*	443,154	4,802,383	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
30	T-30	101.5*	443,011	4,802,014	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
31	T-31	101.5*	443,540	4,801,110	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
32	T-32	101.5*	442,448	4,800,448	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
33	T-33	101.5*	442,838	4,800,465	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
34	T-34	101.5*	442,243	4,800,119	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
35	T-35	101.5*	442,757	4,800,013	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
36^	T-36	101.5*	442,447	4,799,830	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
37	T-37	101.5*	442,062	4,799,669	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
38	T-38	101.5*	442,409	4,799,492	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
39	T-39	101.5*	441,744	4,799,389	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
40^	T-40	101.5*	441,527	4,798,742	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
41	T-41	101.5*	441,764	4,798,145	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
42	T-42	101.5*	441,607	4,797,851	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
43	T-43	101.5*	442,249	4,797,830	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
44	T-44	101.5*	441,123	4,797,225	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
45	T-45	101.5*	440,154	4,796,958	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
46	T-46	101.5*	440,550	4,796,892	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
47^	T-47	101.5*	440,850	4,796,687	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m
48	T-48	101.5*	440,529	4,796,554	Siemens model SWT-3.0-113 Rev. 0, 2.483 MW, hub height 99.5 m

#	Source ID	Sound Power Level (dBA)	Easting (m)	Northing (m)	Source Description
49	R	84.0**	446,784	4,804,831	Reactor
50	TR P1	90.0**	446,804	4,804,813	Phase 1, Trench Reactor
51	TR P2	90.0**	446,804	4,804,806	Phase 2, Trench Reactor
52	TR P3	90.0**	446,805	4,804,799	Phase 3, Trench Reactor
53	TS	88.0**	446,771	4,804,795	Transformer

NOTES:

" * " Wind turbine generators' Sound Power Levels reported above are identified in the guarantee letter prepared by Siemens, dated April 7, 2014.

" ** " The Sound Power Levels reported above for the Transformer and Reactors include the 5 Decibels (dB) adjustment for tonality as prescribed in Publication NPC-104.

" ^ " The identified turbines were not constructed, in accordance with section (a) of Schedule A.

iv) **Table B2 of Schedule B** of the Approval is modified as noted below:

Table B2: Maximum Sound Power Spectrums for the Transformer and the Reactors

Transformer Substation	Octave Band Centre Frequency (Hz)						Overall		
	31.5	63	125	250	500	1000	dB	4000	8000
Transformer Lw (dB)	-	87	92	89	88	79	87	65	56
Reactor {R} Lw (dB)	-	79	99	82	80	66	84	59	50
Reactor {Phase 1} Lw (dB)	60	82.7	106.2	60.6	19.2	-	90-	-	-
Reactor {Phase 2} Lw (dB)	60	82.7	106.2	60.6	19.2	-	90-	-	-
Reactor {Phase 3} Lw (dB)	60	82.7	106.2	60.6	19.2	-	90-	-	-

Note: The Transformer and Reactor Sound Power Level values above include the 5 decibel (dB) adjustment for tonality as prescribed in Publication NPC-104.

This Notice shall constitute part of the approval issued under Approval No. 5186-9HBJXR dated June 26, 2014

In accordance with Section 139 of the Environmental Protection Act, within 15 days after the service of this notice, you may by further written notice served upon the Director, the Environmental Review Tribunal and the Environmental Commissioner, require a hearing by the Tribunal.

In accordance with Section 47 of the Environmental Bill of Rights, 1993, the Environmental Commissioner will place notice of your request for a hearing on the Environmental Registry.

Section 142 of the Environmental Protection Act provides that the notice requiring the hearing shall state:

a. The portions of the renewable energy approval or each term or condition in the renewable energy approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The signed and dated notice requiring the hearing should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The renewable energy approval number;
4. The date of the renewable energy approval;
5. The name of the Director;
6. The municipality or municipalities within which the project is to be engaged in;

This notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Environmental Commissioner
1075 Bay Street, 6th Floor
Suite 605
Toronto, Ontario
M5S 2B1

AND

The Director
Section 47.5, *Environmental Protection Act*
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

Under Section 142.1 of the Environmental Protection Act, residents of Ontario may require a hearing by the Environmental Review Tribunal within 15 days after the day on which notice of this decision is published in the Environmental Registry. By accessing the Environmental Registry at www.ebr.gov.on.ca , you can determine when this period ends.

Approval for the above noted renewable energy project is issued to you under Section 47.5 of the Environmental Protection Act subject to the terms and conditions outlined above.

DATED AT TORONTO this 18th day of July, 2017

Mansoor Mahmood, P.Eng.
Director
Section 47.5, *Environmental Protection Act*

DM/

c: District Manager, MOECC Owen Sound
Jim Mulvale, Grand Bend Wind Limited Partnership