

January 10, 2018

Port Ryerse Wind Power Project

8437084 Canada Inc.

operating as Port Ryerse Wind Farm Limited Partnership

199 Bay Street, Suite 4000

Toronto, Ontario

M5L 1A9

Attn: Port Ryerse Wind Farm

Re: Port Ryerse Wind Farm - Acoustic Audit – Emission Summary

Aercoustics Engineering Limited (“Aercoustics”) was retained by the 8437084 Canada Inc. operating as Port Ryerse Wind Farm Limited Partnership to verify the noise emission of two (2) turbines at the Port Ryerse Wind Farm (“PRWN”).

The purpose of the audit was to confirm whether equipment is operating as per manufacturer’s specifications. The reporting has been prepared to facilitate submission to Ontario’s Ministry of Environment and Climate Change (MOECC), in compliance with acoustic audit conditions outlined in the facility’s REA (#6498-9HKHN3). Specifically, section F (Wind Turbine Acoustic Audit – Emission).

The facility wind turbines were audited utilizing International Standard IEC 61400-11 (Edition 3.0, released 2012-11), “Wind turbine generator systems – Part 11: Acoustic noise measurement techniques”. The following turbines were chosen for the acoustic audit.

Table 1 Summary of Wind Turbine Noise Emission Audit

Turbine ID	Turbine Model	Audit Status
T02	Siemens SWT-3.2-113	Completed
T04	Siemens SWT-3.2-113	Completed

Results of the acoustic audit are summarized in Table 2. Detailed measurement report for T02 (Report ID 14355.00.T02.RP1) and T04 (Report ID 14355.00.T04.RP1) is attached with this letter and outline the apparent sound power level, measurement uncertainties and tonal audibilities.

Table 2 Summary of Wind Turbine Noise Emission Results – Sound Power

Description		T02	T04
Turbine Model		Siemens SWT-3.2-113 2.5 MW	Siemens SWT-3.2-113 2.5 MW
Manufacturer’s Performance Specification		102.5 dBA ± 1.5 dB	102.5 dBA ± 1.5 dB
Permitted Maximum sound power level (dBA)		102.5 dBA +0.5dB	102.5 +0.5dB
Max PWL Audit Result	Measured	103.5 dBA	102.7
	Uncertainty	1.0 dB	1.0 dB

Table 3 Sound Power Levels (overall A-weighted levels and octave bands for each wind speed)

Turbine ID	Wind Speed (m/s)	Octave Band (Hz), dBA									Overall dBA
		31.5	63	125	250	500	1K	2K	4K	8K	
T02	7.5	75.9	86.8	93.1	95.8	95.1	95.4	94.8	86.8	75.3	102.2
	8	76.4	87.5	93.6	96.4	95.7	96.4	95.6	88.0	76.1	102.9
	8.5	76.3	87.4	93.7	96.0	95.7	96.4	95.8	88.4	76.3	102.9
	9	75.9	87.1	93.4	95.7	95.4	96.2	95.6	89.2	77.0	102.7
	9.5	75.8	86.8	93.4	95.9	95.8	96.8	96.2	90.4	78.7	103.1
	10	75.6	86.3	92.7	95.3	95.5	96.6	95.8	89.0	78.0	102.7
	10.5	75.8	86.8	93.0	95.8	96.3	97.6	96.7	90.2	79.8	103.5
	11	75.5	86.5	92.8	95.6	96.2	97.7	96.8	91.3	80.1	103.5
	11.5	76.4	86.9	92.6	95.1	96.0	97.5	96.5	89.4	78.3	103.1
	12	76.4	87.1	92.7	95.3	96.3	97.7	96.6	89.5	78.3	103.3
T04	7.5	73.2	84.8	90.1	94.0	94.7	94.8	93.7	87.8	81.2	101.1
	8	73.9	85.4	90.2	94.2	95.0	95.2	94.2	88.5	81.3	101.5
	8.5	76.0	86.7	91.0	94.6	95.3	95.5	94.4	88.9	81.5	101.8
	9	75.1	86.1	90.8	94.5	95.1	95.4	94.6	89.3	81.6	101.8
	9.5	76.5	86.5	91.3	94.7	95.2	95.7	94.7	89.3	81.7	102.0
	10	79.8	87.5	91.7	94.7	95.5	96.1	95.0	89.7	81.8	102.3
	10.5	81.4	87.8	91.7	94.7	95.8	96.8	95.6	90.1	81.9	102.7
	11	76.2	85.4	90.0	93.7	95.1	96.3	95.3	89.8	81.8	102.0
	11.5	80.2	87.9	91.2	94.3	95.5	96.8	95.8	90.0	81.8	102.6
	12	78.5	86.7	90.6	93.7	95.4	96.8	95.7	90.0	81.7	102.4

Table 4 Tonality Assessment Summary

Turbine ID	Wind Speed (m/s)	Frequency (Hz)	Tonality, ΔL _{in} (dB)	Tonal audibility, ΔL _a (dB)
T02			No Reportable Tones	
T04			No Reportable Tones	


The Acoustic Assessment Report for the facility stipulates a maximum sound power level of 102.5 dBA and a maximum tonal audibility of 3dB for the 2.5MW turbines at the PRWF.

Results of the IEC test at T02 and T04 are compliant with the sound power levels contained within the Manufacturer's Performance Specification, however the results of the IEC test at T02 exceed the maximum sound power level specified in the Acoustic Assessment Report. The measured tonal audibility values of Wind Turbine Generator T02 and T04 comply with the maximum tonal audibility value noted in the Acoustic Assessment Report.

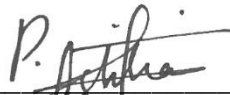
As the results of the noise testing completed at Turbine T02 exceed the maximum sound power level specified in the Acoustic Assessment Report by 1.0dBA the owner/operator intends to demonstrate compliance at the worst-case receptors in accordance with section E3.1 E-Audit review processes of the Compliance Protocol for Wind Turbine Noise. Specifically, Option 1: Re-modelling has been chosen to demonstrate compliance at the worst-case receptor. As the worst case predicated sound level at a receptor for the PRWF is more than 1 dBA below the MOECC sound level limit (38.6 dBA this option is expected to demonstrate compliance with Condition F of the REA.

Sincerely,

Aercoustics Engineering Limited



Allan Munro, B.A.Sc.



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