

March 12, 2018

Ministry of the Environment and Climate Change  
Environmental Assessment and Permissions Branch  
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Attention: Mohsen Keyvani

**VIA EMAIL**  
[mohsen.keyvani@ontario.ca](mailto:mohsen.keyvani@ontario.ca)

Gentlemen:

Re: Unifor Wind Turbine  
Noise Abatement Action Plan  
Port Elgin, Ontario  
Our File: 06-107-01



As requested in your e-mail dated January 8, 2018 and in accordance with the 4<sup>th</sup> paragraph of Section E 5.1 of the 2017 Compliance Protocol for Wind Turbine Noise, this Noise Abatement Action Plan (NAAP) has been prepared.

The Acoustic Audit – “*Immission Report Unifor Wind Turbine, Port Elgin, Ontario*” dated January 8, 2018, prepared by HGC Engineering Limited indicated an exceedance of 2 dBA over the sound level criteria at one of the neighbouring receptors (M1). Measurements at the other monitoring locations did not yield sufficient data to conclude if an exceedance over the sound level is occurring.

Based on this information together with available information from the turbine manufacturer ENERCON GmbH (provided in the attached Appendix A), the following noise abatement measures are proposed to be incorporated into the turbine operating parameters.

- Curtailment (zero revolutions per minute) when the wind direction is between 100 and 220 degrees during all hours; and
- Derating the turbine to 300 kW during the evening and nighttime hours (7:00 p.m. to 7:00 a.m. at all wind speeds). This would have the benefit of reducing the sound level by 2.5 dBA, which is expected to meet the sound level limits in the evening and nighttime hours.
- Allow the turbine to run at 500 kW during the daytime hours to determine if the guidelines can be met at this power level. There is currently insufficient

measurement data to indicate if the daytime ambient is higher than the MOECC exclusion limits. Once the measurement data is obtained, if the turbine exceeds the sound level limits at 500 kW, additional mitigation measures would be reviewed.

As it has been difficult to obtain the required data to satisfy the MOECC protocol for an acoustic audit, the abatement measures discussed in this NAAP have already been implemented and the sound measurements have commenced at M1, M2 and M3. This has been done to allow the measurement data to be collected as quickly as possible. Measurement locations and procedures for the I-Audit are expected to be consistent with the previously completed I-Audit dated January 8, 2018, prepared by HGC Engineering. Should the MOECC have any concerns with the proposed approach, discussions can be undertaken and the NAAP revised accordingly.

The Immission Acoustic Audit will run for approximately 8 weeks and it is expected that the updated Immission Acoustic Audit report will be completed by the end of June, 2018. If exceedances are shown additional mitigation measures will be evaluated.

If there are any questions, please do not hesitate to call.

Yours truly,

JADE ACOUSTICS INC.

Per:

  
Chris B. Kellar, P.Eng.



Per:

  
Dalila C. Giusti, P.Eng.



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## APPENDIX A

### INFORMATION FROM ENERCON GmbH

# Sound Power Level of the ENERCON E-48 Reduced Modes (Data Sheet)

**Imprint**

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**Revision**

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 Department: ENERCON GmbH / Site Assessment

**Glossary**

WEC means an ENERCON wind energy converter.  
 WECs means more than one ENERCON wind energy converter.

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## Sound Power Levels for the E-48 with reduced rated power

Sound Power Levels for the E-48 with reduced rated power					
	$P_{N,red}=700 \text{ kW}$ $n_{N,red}=29,0 \text{ U/min}$	$P_{N,red}=600 \text{ kW}$ $n_{N,red}=28,5 \text{ U/min}$	$P_{N,red}=500 \text{ kW}$ $n_{N,red}=28,0 \text{ U/min}$	$P_{N,red}=400 \text{ kW}$ $n_{N,red}=26,5 \text{ U/min}$	$P_{N,red}=300 \text{ kW}$ $n_{N,red}=25,0 \text{ U/min}$
<b>95% rated power</b>	<b>101.5 dB(A)</b>	<b>100.6 dB(A)</b>	<b>100.0 dB(A)</b>	<b>98.5 dB(A)</b>	<b>97.5 dB(A)</b>

<i>Measured value at 95% nominal power</i>		<b>99,6 dB(A)</b> <i>WICO 439SEC04/02</i>	<b>99,0 dB(A)</b> <i>MBBM 69 130/1</i>		<b>95,6 dB(A)</b> <i>MBBM 64 550/6</i>
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- The respective SPL is given for 95%  $P_{N,red}$  and is therefore valid for all hub heights.
- A tonal audibility of  $\Delta L_{a,k} < 2 \text{ dB}$  can be expected over the whole operational range (valid in the near vicinity of the turbine according to IEC 61 400 -11 ed. 2).
- The sound power level values given in the table are valid for the respective reduced Modes (defined via the reduced rated power  $P_{N,red}$  and the reduced rated rotational speed  $n_{N,red}$ ).
- The power curves for the respective reduced modes are given in a separate document which can be made available upon request.
- Due to the typical measurement uncertainties, if the sound power level is measured according to one of the accepted methods the measured values can differ from the values shown in this document in the range of +/- 1 dB.

Accepted measurement methods are:

- IEC 61400-11 ed. 2 („Wind turbine generator systems – Part 11: Acoustic noise measurement techniques; Second edition“), and
- the FGW-Guidelines („Technische Richtlinie für Windenergieanlagen – Teil 1: Bestimmung der Schallemissionswerte“, published by the association “Fördergesellschaft für Windenergie e.V.“, 18<sup>th</sup> revision).

If the difference between total noise and background noise during a measurement is less than 6 dB a higher uncertainty must be considered.

- Sound Power values for further reduced modes can be provided upon request.
- The sound power level of a wind turbine depends on several factors such as but not limited to regular maintenance and day-to-day operation in compliance with the manufacturer's operating instructions. Therefore, this data sheet can not, and is not intended to, constitute an express or implied warranty towards the customer that the E-48 WEC will meet the exact sound power level values as shown in this document at any project specific site.

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