

ACOUSTIC TESTING PLAN – **Project: 17283.01**

North Kent Wind 1 LP **NAAP Validation Measurement Plan** Chatham-Kent, Ontario

Prepared for:

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Revision History

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1 Introduction

Aeroustics Engineering Limited (Aeroustics) has been retained by North Kent Wind 1 LP to complete the acoustic immission audit requirements outlined in the Renewable Energy Approval (REA) for the North Kent Wind Farm (NkWPP). NkWPP operates under REA #5272-A9FHRL, issued on June 29, 2016.

As per the REA, five (5) I-Audit measurement locations are required. Based on the results of the Phase 2 audit, the cumulative sound impact calculated at location R3408 does not comply with the MECP sound level limits and exceeds the limit by 1 dB due to a tonal penalty in the 4 m/s wind bin during Downwind conditions. NkWPP has proposed a Noise Abatement Action Plan (NAAP) which aims to achieve compliance by reducing the noise emissions of the two turbines closest to receptor R3408, turbines T03 and T04.

In order to validate the NAAP performance, the MECP has requested that an additional I-Audit campaign be conducted at receptor R3408, and that additional E-Audit measurements be conducted at turbines T03 and T04. This request was delivered in an email from the MECP dated July 16, 2020, and was agreed upon by NkWPP on July 28, 2020.

This report has been prepared to provide a clear indication of our approach and methodology for the NAAP Validation testing required for the NkWPP, as well as to provide an approximate timeline for completion of the NAAP validation scope.

2 Audit Methodology

2.1 I-Audit Measurements

The proposed I-Audit methodology is based on unattended measurements and is in accordance with Part D of the Compliance Protocol for Wind Turbine Noise; NPC 350, April 2017. The measurement methodology is as follows:

- A single measurement campaign will be carried out at the designated receptor with the aim to collect sufficient datapoints per MECP requirements;
- To quantify the noise contribution from factors other than the subject turbine(s), nearby turbines will need to be parked or turned on, according to site conditions;
- Obtaining sufficient data is heavily dependant on weather conditions and cannot be guaranteed. If sufficient data is not collected during the given time, alterations to the proposed filters may be considered, in consultation with the MECP;
- Meteorological data will be collected using an anemometer at a height of 10 m.

2.2 E-Audit Measurements

The proposed E-Audit methodology is based on and in accordance with the IEC 61400-11 Edition 3.0 testing standard. The measurement methodology is as follows:

- A single measurement campaign will be carried out at each of the two designated turbines (T03 and T04);
- Support from the manufacturer will be required, as critical turbine output data (turbine power output, yaw angle, rpm) must be provided from the base of the turbine to facilitate analysis;
- To quantify the noise contribution from factors other than the subject turbine, nearby turbines will need to be parked according to site conditions;
- The measurement campaign will continue until sufficient data has been collected, which may necessitate multiple site visits to the same turbine. Obtaining sufficient data is heavily dependant on weather conditions;
- Meteorological data will be collected using an anemometer at a height of 10 m above grade.

3 NAAP Validation Timeline

3.1 I-Audit Timeline

Timing of the I-Audit deployment depends on favorable conditions in regard to weather, crop type, and landowner approval. As the crops around the receptor in question are soya beans, deployment is possible in early September pending NAAP implementation and equipment availability.

I-Audit requirements at R3408 necessitate sufficient data as per MECF requirements in both downwind and crosswind data, which is more comprehensive than typical receptor audits. The downwind direction is not the predominant wind direction.

Based on previous campaigns at this location, a minimum of 10 weeks is likely required in order to capture both downwind and crosswind data, however past measurement campaigns at this location have extended up to 18 weeks.

It is important to note that the campaign duration depends heavily on weather conditions and cannot be exactly predicted.

Data analysis, processing, and reporting can be completed within approximately 6 weeks of full measurement collection.

Table 1 provides a summary of the preceding information along with an approximate timeline for I-Audit measurements at R3408.

Table 1 – Approximate NAAP Validation I-Audit Timeline at NKWPP Receptor R3408

Milestone	Approximate Duration	Anticipated Period of Completion
Monitor deployment	-	September 2020
Data collection	10+ weeks	November 2020 to January 2021
Data analysis, processing, reporting	6 weeks	December 2020 to February 2021

3.2 E-Audit Timeline

Timing of E-Audit measurements depends on favourable conditions in regard to weather, crop type, and landowner approval. As the crops around T03 and T04 are soya beans and ground cover, measurements are possible in early September pending NAAP implementation and equipment availability.

In past experience, the suitable fall window for E-Audits measurements is between September and November. It is noted, however, that weather forecasts and site conditions are subject to very quick changes which may result in incomplete E-Audit measurements. Additional test dates or re-testing may be required in order to collect the required number of datapoints, which may delay the delivery of E-Audits results.

Data analysis, processing, and reporting can be completed within approximately 3 weeks of full measurement collection. If weather conditions are favourable throughout the fall window, E-Audit results are likely to be available by December 2020.

4 Conclusion

We hope this test plan provides a clear indication of our approach and methodology for the NAAP Validation testing required for NKWPP. If there are any questions or concerns, please do not hesitate to contact the authors of this report.