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Report ID: 16115.01.T12.RP3

Nation Rise Wind Farm / Turbine T12
IEC 61400-11 Edition 3.0 Measurement Report

Prepared for:

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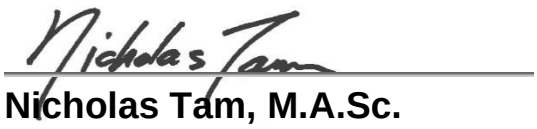

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September 23, 2022

Revision History

Version	Description	Author	Reviewed	Date
RP1	Initial Report	NT	KC, DH	June 8, 2022
RP2	Revisions in Tables 2,4 and Appendix F.02 for clarity, added references, added Appendix F.04 for details regarding microphone location	NT	KC, DH	August 9, 2022
RP3	Minor clarification regarding reference yaw angle in Appendix F.04	KC	DH	September 23, 2022

This report in its entirety, including appendices contains 96 pages.

Statement Qualifications and Limitations

This report was prepared by Aercoustics Engineering Limited in accordance with International Standard IEC 61400-11 (Edition 3.0, released 2012-11), "Wind turbine generator systems – Part 11: Acoustic noise measurement techniques". This report is specific only to the Wind Turbine identified in this report.

Aercoustics Engineering Limited shall not be responsible for any events or circumstances that may have occurred since the date on which the Wind Turbine was tested and/or this report was prepared, or for any inaccuracies contained in information that was provided to Aercoustics Engineering Limited. Further, Aercoustics Engineering Limited agrees that this report represents test data analysed as per the above described standard for the specific Wind Turbine described in this report, but Aercoustics Engineering Limited makes no other representations with respect to this report or any part thereof.

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Any use of this report is subject to this Statement of Qualifications and Limitations. Any damages arising from improper use of this report or parts thereof shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of this report.

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1 Introduction

Aercoustics Engineering Limited ("Aercoustics") was retained by Nation Rise Wind Farm Limited to conduct acoustic measurements of the wind turbine T12, located in the Nation Rise Wind Farm. Measurements were carried out in accordance with IEC 61400-11 (edition 3.0), "*Wind turbine generator systems – Part 11: Acoustic noise measurement techniques*". The IEC 61400-11 (edition 3.0) test standard is referred to in this report by its citation reference, [1]. This report is specific only to turbine T12.

Aercoustics is an ISO/IEC 17025 test laboratory accredited for IEC 61400-11 testing.

2 Wind Turbine Information

2.1 Wind Turbine Equipment Details

Equipment information specific to turbine T12 was provided by Nation Rise Wind Farm Limited and is summarized in Table 5.

Table 1 - Wind Turbine Details

Wind Turbine Details	
Manufacturer	Enercon
Model Number	E-138 E1
Turbine ID (Serial Number)	13800024, NRS08, T12

Table 2 - Operating Details

Operating Details	
Vertical or Horizontal axis wind turbine	Horizontal
Upwind or downwind rotor	Upwind
Hub height	131m
Horizontal distance from rotor centre to tower axis	6 m
Diameter of rotor	138m
Tower type (lattice or tube)	Tube
Passive stall, active stall, or pitch controlled turbine	Pitch controlled
Constant or variable speed	Variable speed
Power curve	See Figure B.01 [Appendix B]
Rotational speed at each integer standardised wind speed	See Figure B.02 [Appendix B]
Rated power output	3.44MW
Control software version	1.31

Table 3 - Rotor Details

Rotor Details	
Rotor control devices	Electric motors
Presence of aerodynamic add-ons, such as vortex generators, stall strips, serrated trailing edges, etc.	Leading Edge Erosion Protection, Vortex Generators, Trailing Edge Serrations
Blade type	E138 EP3-RB-01
Serial number	Set no: 0020 GO, BladeA GO 0067, Blade B GO 0064, Blade C GO 0066
Number of blades	3

Table 4 - Gearbox Details

Gearbox Details	
Manufacturer	NA
Model number	NA
Serial number	NA

Note: Turbine T12 is of a direct-drive (gearless) design. The turbine does not contain a gearbox.

Table 5 - Generator Details

Generator Details	
Manufacturer	Enercon
Model number	E-138 EP3-GE-01
Serial number	27-33

2.2 Wind Turbine Location / Physical Environment

UTM coordinates of Turbine T12 are 484260 m E and 5004075 m N, Zone 18T. The area surrounding the test turbine was flat farmland with ground surface of trimmed corn crops stocks around the test turbine. Water puddles were presented in the field.

A general layout of the test turbine and surrounding area is provided in the site plan (Figure A.01).

3 Measurement Details

3.1 Instrumentation

The instrumentation used to acquire acoustic, meteorological (“MET”), and turbine operational data is detailed in the following sections. All data was acquired synchronously using Aercoustics’ data acquisition system unless otherwise noted.

3.1.1 Acoustic Equipment

Acoustic equipment used for the testing is summarized in Table 6. The acoustic equipment used in the test conforms to the traceable calibration requirements prescribed in Section 6.3 of [1]. A field calibration of the measurement chain was performed at the beginning and end of each measurement day.

Table 6 – Acoustic Measurement Equipment

Equipment	Make & Model	Serial Number	Last Calibration Date
Data acquisition system	LMS SCADA Mobile	22143211	June 5, 2020
Microphone	B&K 4189	2625197	June 24, 2021
Pre-amplifier	B&K 2671	2614901	June 24, 2021
Signal Conditioner	PCB 480E09	36960	September 29, 2021
Acoustic calibrator	B&K 4231	2053016	August 06, 2021

3.1.2 Meteorological Equipment

Meteorological parameters were measured using an anemometer installed on top of a 10-m AGL[1] mast. The anemometer recorded wind speed, temperature, and atmospheric pressure for the duration of the test. Wind speed at hub-height was recorded from the test turbine. Meteorological equipment utilized and controlled by Aercoustics is summarized in Table 7; this equipment conforms to the traceable calibration requirements prescribed in Section 6.3 of [1]. Equipment used by the test turbine to measure turbine parameters are outside of Aercoustics' control and not reported here.

Table 7 – Meteorological Measurement Equipment

Equipment	Make & Model	Serial Number	Last Calibration Date
Weather anemometer	Vaisala WXT 520	K2420011	July 14, 2020
Serial to Analog Converter	Nokeval 7470	A165152	August 04, 2020

3.1.3 Turbine Operational Information

Turbine operational parameters were acquired from the turbine controller simultaneously with the acoustic and meteorological data using Aercoustics' data acquisition system. Turbine parameters measured include electrical power, yaw angle, rotational speed, and nacelle wind speed. Equipment used by the test turbine to measure turbine parameters are outside of Aercoustics' control and not reported here.

3.1.4 Microphone and MET Tower Placement

The measurement microphone was installed in Position 1, according to Figure 3 of [1]. The horizontal distance from microphone to the centerline of the wind turbine tower was R_0 = 212 m. The microphone was placed 12 m further than the nominal horizontal distance due to the presence of large water puddle at the nominal horizontal distance location –

[1] Above ground level

additional information on the microphone placement is included in Appendix F.04. An elevation difference of 0 metres between the microphone position and the base of the wind turbine was noted by test personnel at the time of the measurements. The slant distance from microphone location to rotor centre was R_1 = 254.3 m (includes the distance from rotor center to tower centreline).

The microphone was placed in a downwind position on the centre of a circular, acoustically reflective board. The downwind direction was determined using the turbine yaw angle output (Section 8.3 of [1]). The microphone position relative to downwind direction was monitored via the turbine yaw angle and data points were excluded from analysis when the turbine yaw angle exceeded ±15 degrees from the microphone position (reference yaw angle).

The area immediately surrounding the microphone board was farmland with bare soil and trimmed corn crop stocks. There were no reflecting surfaces in the vicinity of the microphone position during the test.

The 10-m AGL mast was installed in a crosswind position from the turbine tower, according to Figure 5 of [1].

Photos of the 10-m AGL mast and microphone board used during the test are provided in Figure A.02.

3.1.5 Double Windscreen Setup

A double windscreen was utilized, and the measurement data was adjusted to account for the insertion loss of the double windscreen. The insertion loss of the double windscreen has been tested per Annex E of [1].

3.2 Measurement Date and Time

Measurement data collected for this test was acquired during the following times.

Table 8 – Summary of Measurement Periods

Date	Test Type	Start Time	Finish time
March 21, 2022	Turbine ON	12:23	12:55
	Background	12:56	13:42
	Turbine ON	14:03	15:06
	Background	15:11	17:40

3.3 Determination of Normalized Wind Speed

The normalized hub height wind speed for Turbine ON intervals was determined using one of the following two methods, depending on the hub-height wind speed during the interval:

The power curve method (Section 8.2.1.1 of [1]) is used to determine normalized hub-height wind speed if the power output during the interval falls within the allowable range of the power curve. The allowable range is defined per Equation (3) of [1] as the range of wind bins where the power curve has a positive slope.

The nacelle plus correction method (Section 8.2.1.2 of [1]) is used to determine normalized hub-height wind speed if the power output falls outside the allowable range of the power curve. If the application of this method results in a normalized wind speed that falls back inside the allowable range of the power curve, then that data point is excluded from analysis.

The normalized hub height wind speed for Background intervals is determined using the 10-m AGL anemometer wind speed and applying a correction factor (k_Z) to adjust to hub-height (Section 8.2.2 of [1]).

3.3.1 Wind Speed Correction Factors

Following the methodologies described above, two correction factors are derived from the measurement data and used to determine the normalized hub-height wind speed outside the allowable power curve range.

The first correction factor (k_nac) is used to correct nacelle wind speeds for Turbine ON intervals that fall outside of the allowable power curve range. The second correction factor (k_Z) is used to correct Background 10-m AGL wind speeds to hub-height. The correction factors calculated for this measurement set are provided in Table 9.

Table 9 – Calculated nacelle anemometer (k_nac) and 10 m (k_Z) wind speed k-factor

k_nac	k_Z
1.08	1.19

3.4 Deviations from IEC-61400-11 Edition 3.0

No deviations.

3.5 Special Notes & Considerations

Turbines T10 and T11 were parked during the measurement period. These turbines, and their position relative to the test turbine, are shown in Figure A.01.

Transient events (such as vehicle traffic, wildlife, air traffic, etc.) are manually excluded from the measurement data set.

4 Measurement Results

Measurement results are summarized in this section. Detailed supporting information is provided in Appendix C (1/3rd octave sound levels and uncertainties), Appendix D (tonality assessment), and Appendix E (measurement dataset).

4.1 Sound Pressure Levels

Average overall sound pressure levels in each wind bin for all Turbine ON and Background periods are summarized in Table 10.

Table 10 – Summary of Sound Pressure Level Measurements

Wind Speed (m/s)	Turbine ON		Background		Turbine ON, Background adjusted L_{eq}, (dBA)
	L_{eq}, (dBA)	# of data pts	L_{eq}, (dBA)	# of data pts	
8.0	48.8	11	40.4	107	48.2
8.5	49.3	13	40.8	118	48.7
9.0	49.7	19	41.5	157	49.1
9.5	49.9	40	41.8	129	49.2
10.0	50.3	29	42.5	108	49.6
10.5	50.4	23	42.3	98	49.7
11.0	50.6	20	41.9	46	50.1
11.5	51.0	64	42.8	37	50.4
12.0	51.0	64	42.5	16	50.4
12.5	51.2	56	42.8	11	50.6

* denotes a 3 to 6 dB difference between Turbine ON and Background
** denotes a less than 3 dB difference between Turbine ON and Background; level not reported

4.2 Apparent Sound Power Level

The calculated apparent sound power levels by hub height wind speed are summarized in Table 11. Corresponding sound power levels by 10 m height wind speed are summarized in Table 12. Wind speeds at 10 m are calculated per Section 9.4 of [1].

Table 11 – $L_{WA,K}$ at each integer wind speed

Wind Speed (m/s)	Apparent L_{WA}, (dBA)	Uncertainty (dB)
8.0	101.3	1.0
8.5	101.8	0.9
9.0	102.2	0.9
9.5	102.3	0.9
10.0	102.7	0.9
10.5	102.8	0.9
11.0	103.2	0.9
11.5	103.5	0.9
12.0	103.5	0.9
12.5	103.7	0.9

* denotes a 3 to 6 dB difference between Turbine ON and Background
** denotes a less than 3 dB difference between Turbine ON and Background; level not reported

Table 12 – $L_{WA\ 10m,\ K}$ at each integer wind speed

Wind Speed (m/s)	Apparent L_{WA}, (dBA)	Uncertainty (dB)
5.0	100.7	1.3
6.0	102.0	0.8
7.0	102.9	0.9
8.0	103.5	0.9
9.0	103.7	0.9

* denotes a 3 to 6 dB difference between Turbine ON and Background
** denotes a less than 3 dB difference between Turbine ON and Background and are not reported

4.3 Uncertainty

The uncertainty of the test result is the combination of Type A and Type B uncertainty. Detailed uncertainties calculated for overall and 1/3rd octave band sound levels are provided in Appendix C.

4.3.1 Type A Uncertainty

Type A measurement uncertainty is calculated based on the distribution of the measured sound levels and wind speeds during the test. Calculation of Type A uncertainy is conducted per Section 9.2 of [1].

4.3.2 Type B Uncertainty

Type B uncertainty is determined using the guidance provided in Annex C of [1] and equipment calibration records. A summary of Type B uncertainties is provided in Table 13.

Table 13 – Summary of Type B uncertainties

Component	Typical (dB)	Used (dB)
Calibration	0.2	0.2
Board	0.3	0.3
Distance & direction	0.1	0.1
Air absorption	0	0
Weather conditions	0.5	0.5
Wind speed measured	0.7	0.7
Wind speed derived	0.2	0.2
Wind speed from power curve	0.2	0.2

4.4 Tonality Analysis

Tonal audibility is determined for each wind speed bin per Section 9.5 of [1]. The results of the tonality analysis are summarized in Table 14. All ΔL_{tn} and ΔL_a values reported represent the energy average of all data points having an identified tone that fall within the same frequency of origin (Section 9.5.8 of [1]).

The average narrow band spectrum measured at each hub-height wind speed are provided in Appendix D.

Table 14 – Tonality Assessment Summary

Wind Speed (m/s)	Frequency (Hz)	Tonality, ΔLtn (dB)	Tonal audibility, ΔLa (dB)	FFT's with tones	Total # of FFT's	Presence (%)
8.0	No Tones					
8.5	122	-4.8	-2.8	13	13	100%
9.0	124	-3.7	-1.6	19	19	100%
9.5	124	-2.1	-0.1	40	40	100%
10.0	125	-0.9	1.1	29	29	100%
10.5	125	-2.5	-0.4	23	23	100%
11.0	126	-2.2	-0.2	19	20	95%
11.5	130	-1.8	0.2	64	64	100%
12.0	130	-1.3	0.7	63	64	98%
12.5	131	-1.3	0.7	56	56	100%

5 Closure

Measurements and analyses per IEC 61400-11 (edition 3.0) were performed on turbine T12 of the Nation Rise Wind Farm, located in North Stormont, Ontario. The test turbine was found to have a maximum apparent sound power level of 103.7 dBA and a maximum tonal audibility of 1.1 dB.

Supplementary information to address specific local regulatory requirements are attached separately in Appendix F.

6 References

[1] IEC 61400-11 Ed.3.0, *Wind Turbines - Part 11: Acoustic noise measurement techniques,* International Electrotechnical Commission, 2012.

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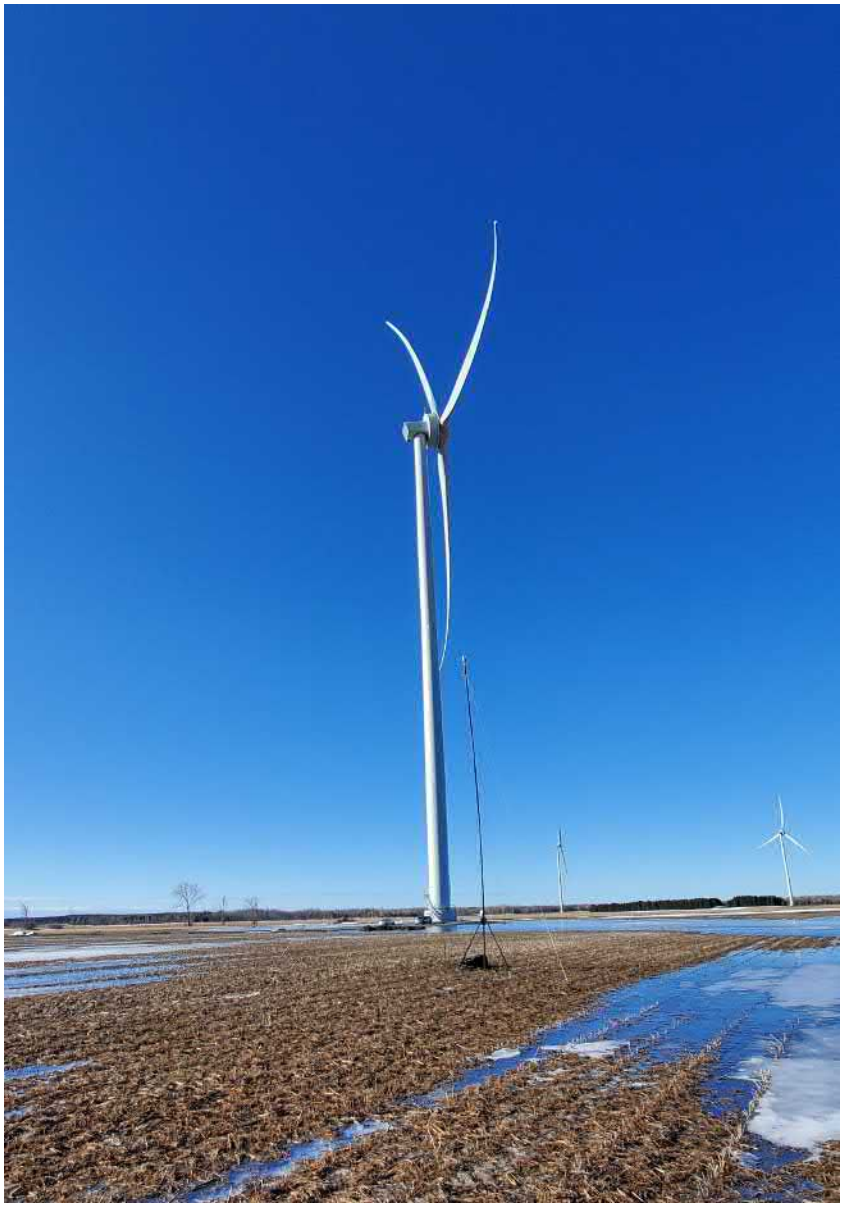
Appendix A
Site Details

aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: As Shown Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Site Plan
		Figure A.01



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Project Name

Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Figure Title

Site Photos

Figure A.02

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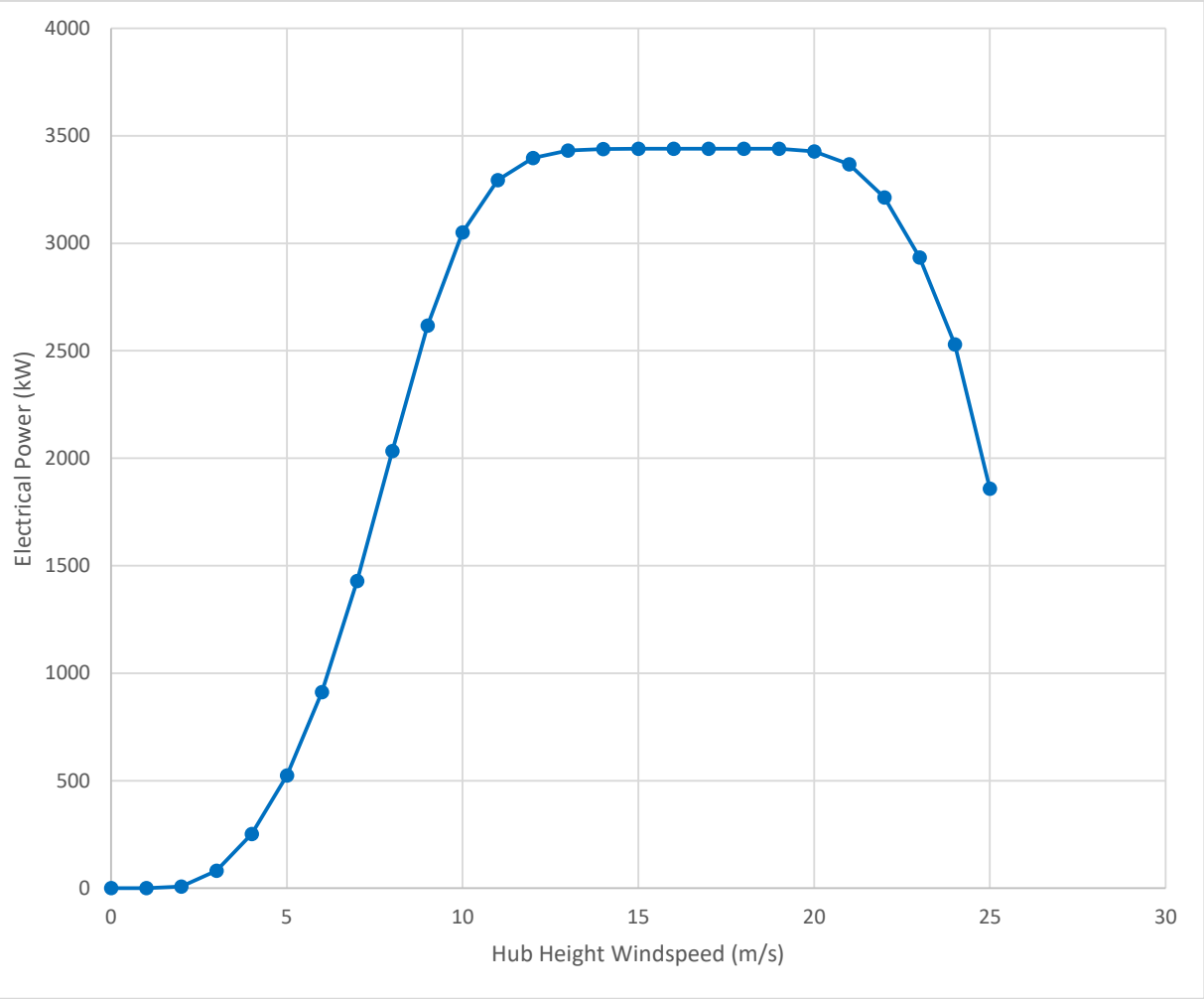
Appendix B
Turbine Information



Power Curve	
Hub Wind Speed (m/s)	Power [kW]
0	0
1	0
2	8
3	81
4	252
5	524
6	912
7	1429
8	2034
9	2617
10	3051
11	3294
12	3397
13	3431
14	3439
15	3440
16	3440
17	3440
18	3440
19	3440
20	3427
21	3367
22	3214
23	2934
24	2530
25	1858

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Revision: 1

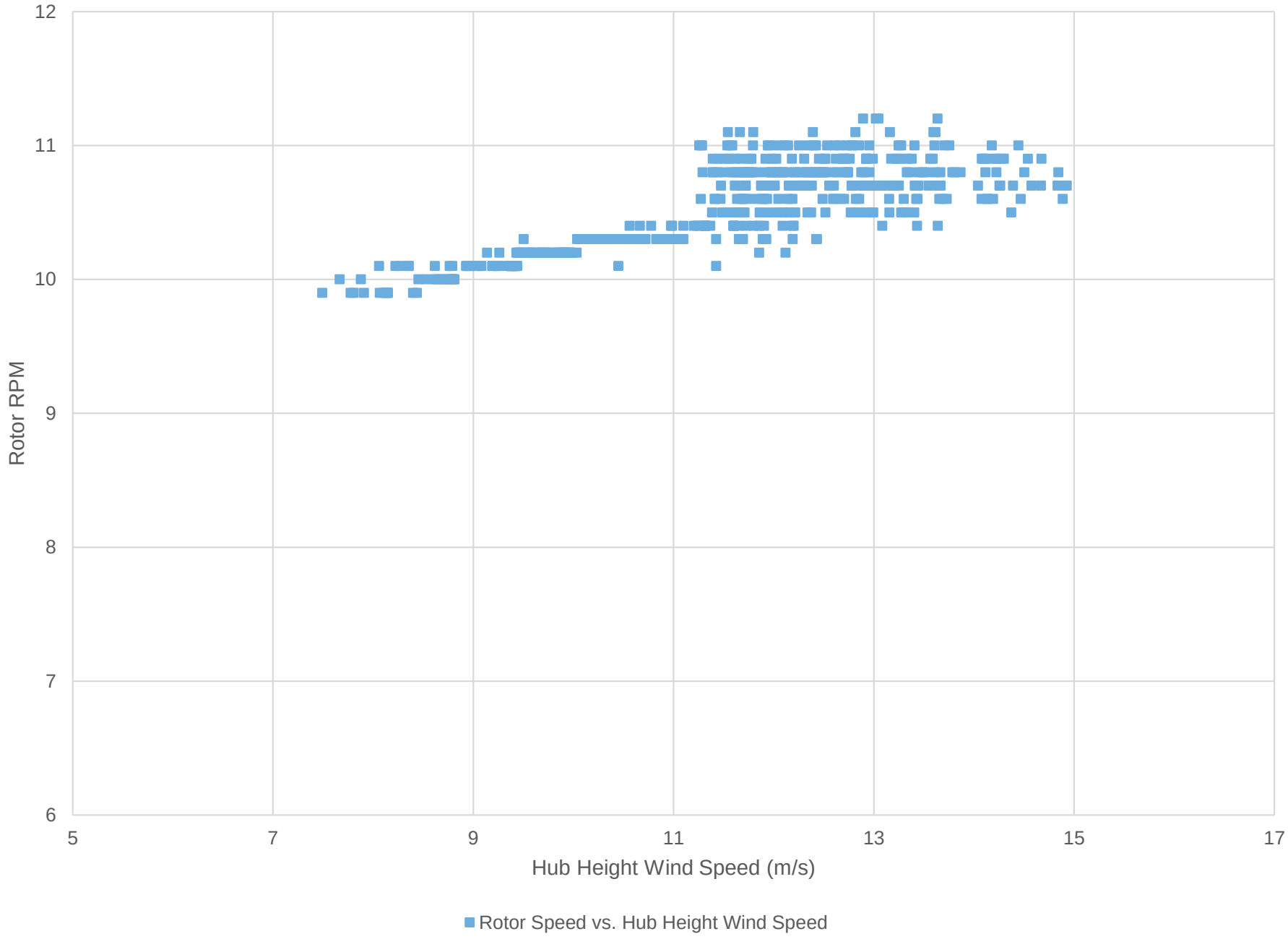
Project Name

Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Figure Title

Power Curve

Figure B.01



aercoustics	16115.01.T12.RP3 Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	**Project Name** Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12 **Figure Title** Rotor RPM vs. Wind Speed

Figure B.02

Table B.01 Allowed range of power curve and required wind speeds

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-12

Power Curve & Required Wind Speeds		
Power Curve Tolerance	1.0%	
Acceptable range min	2	m/s
Acceptable range max	11	m/s
Min allowable range	2	m/s
Max allowable range	11	m/s
Power Output	3440	kW
85% Power	2924	kW
Corresponding wind speed	9.71	m/s
Minimum bin	8.0	m/s
Maximum bin	12.5	m/s

Power Curve		
Hub Wind Speed (m/s)	Power [kW]	slope
0	0	-68.8
1	0	-60.8
2	8	4.2
3	81	102.2
4	252	203.2
5	524	319.2
6	912	448.2
7	1429	536.2
8	2034	514.2
9	2617	365.2
10	3051	174.2
11	3294	34.2
12	3397	-34.8
13	3431	-60.8
14	3439	-67.8
15	3440	-68.8
16	3440	-68.8
17	3440	-68.8
18	3440	-68.8
19	3440	-81.8
20	3427	-128.8
21	3367	-221.8
22	3214	-348.8
23	2934	-472.8
24	2530	-740.8
25	1858	

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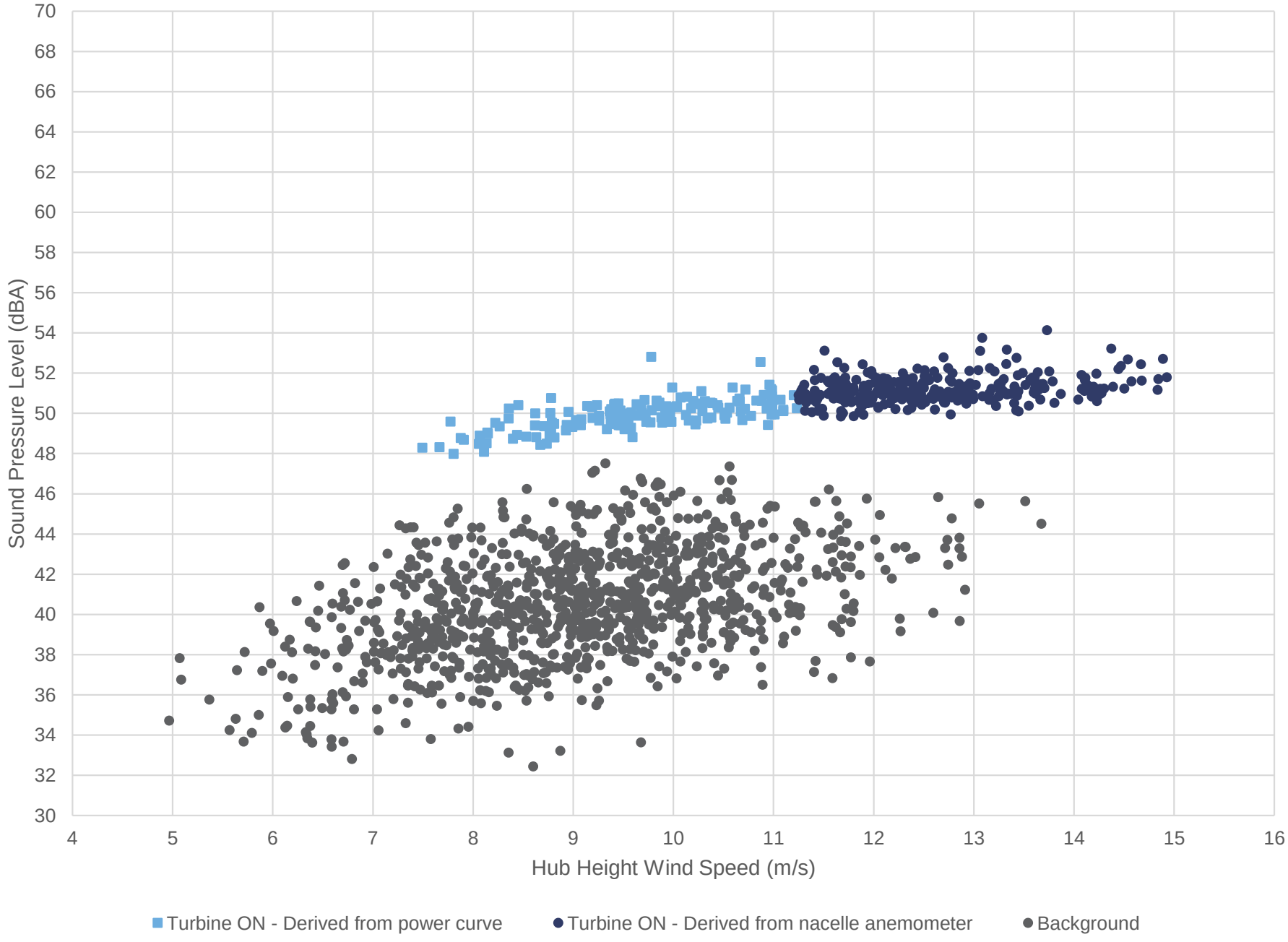
Appendix C
Apparent Sound Power Level



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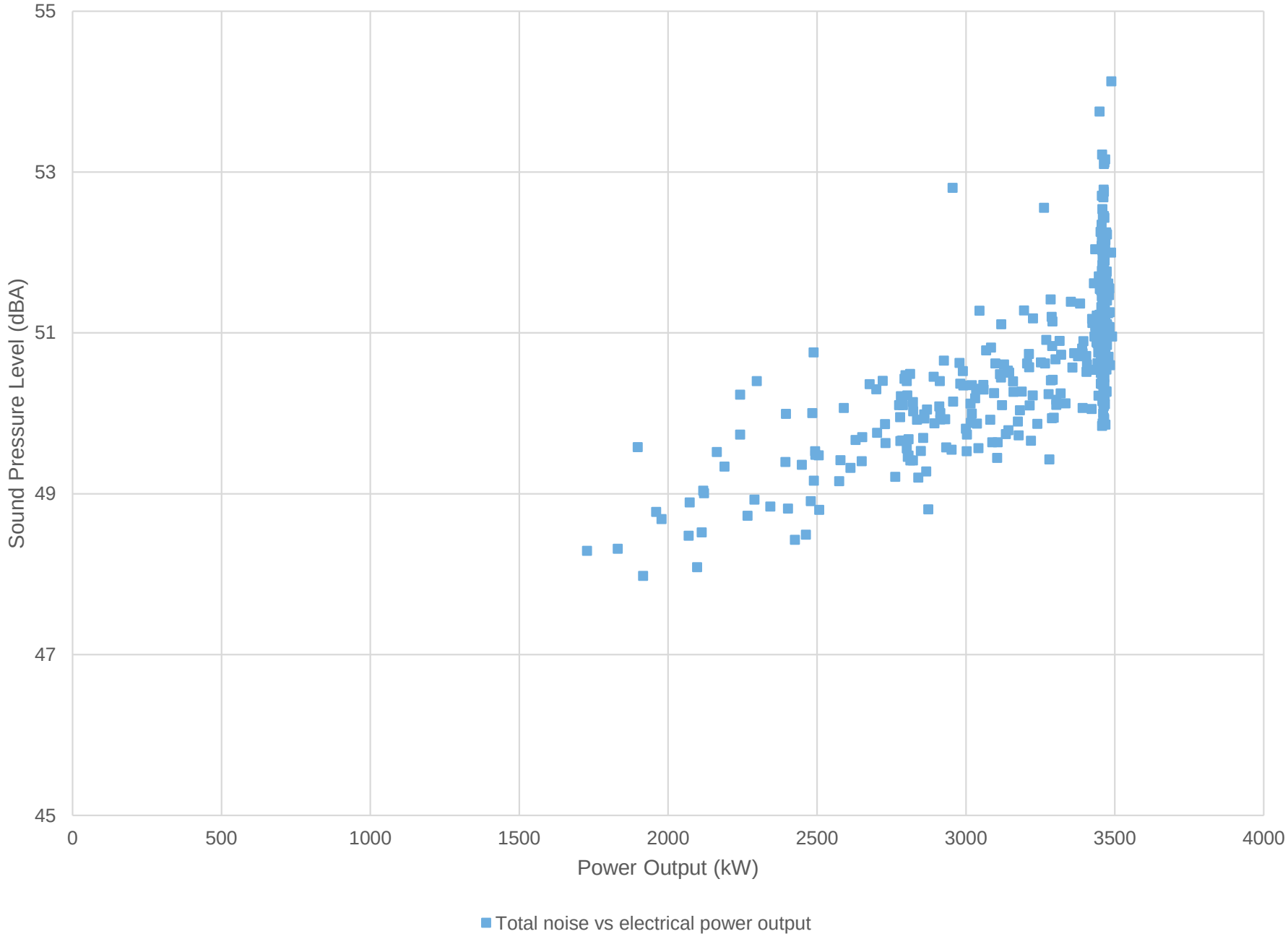
16115.01.T12.RP3	
Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	**Project Name** Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
	Figure Title Plot of overall measurement data pairs at Position 1 (Turbine ON & Background)

Figure C.01



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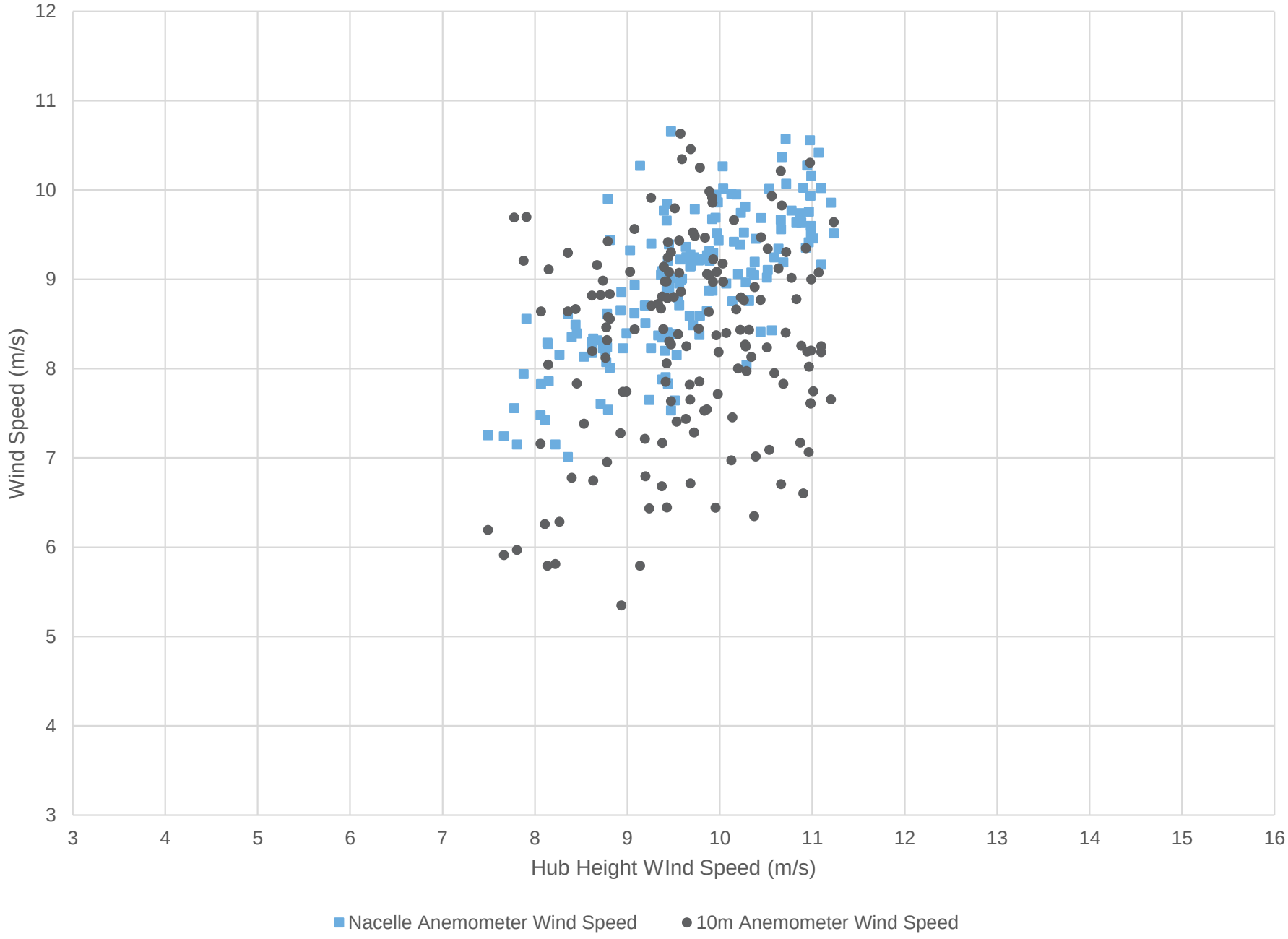
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of measured total noise vs. electrical power output
		Figure C.02



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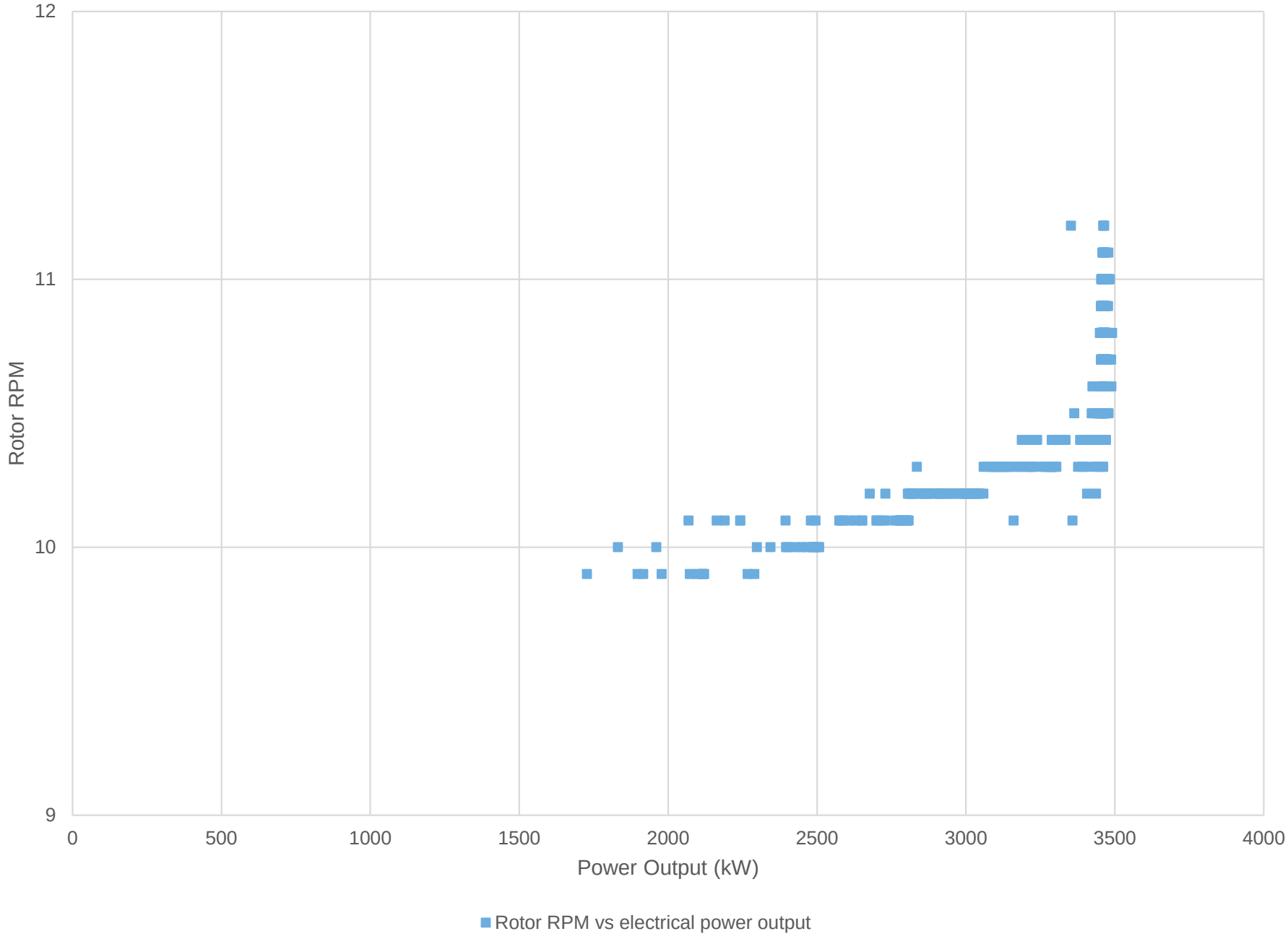
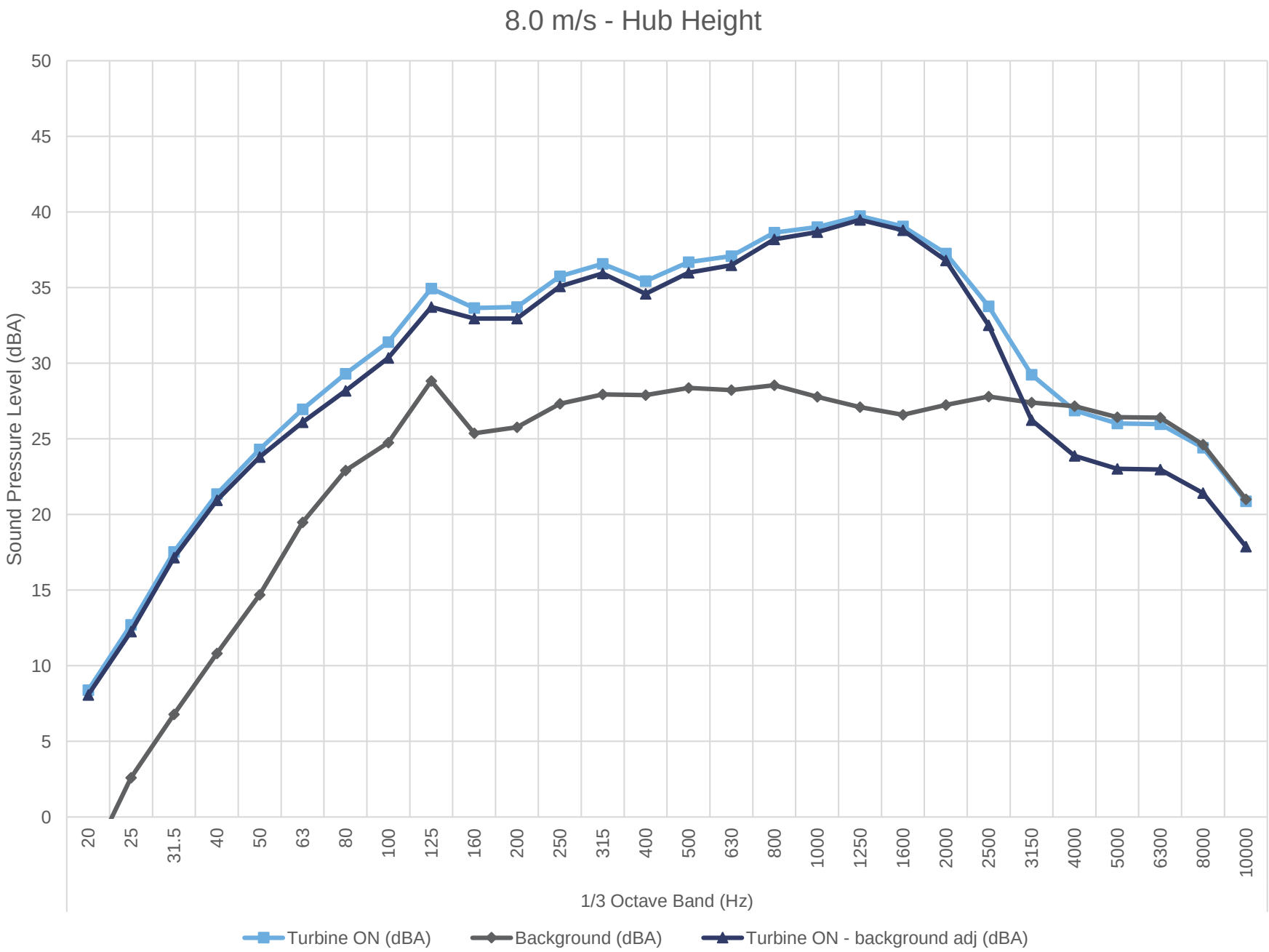
Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
	Figure Title Plot of power curve relative to nacelle anemometer and 10m anemometer

Figure C.03



aercoustics	16115.01.T12.RP3 Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	**Project Name** Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12 **Figure Title** Plot of Rotor RPM vs. electrical power output

Figure C.04



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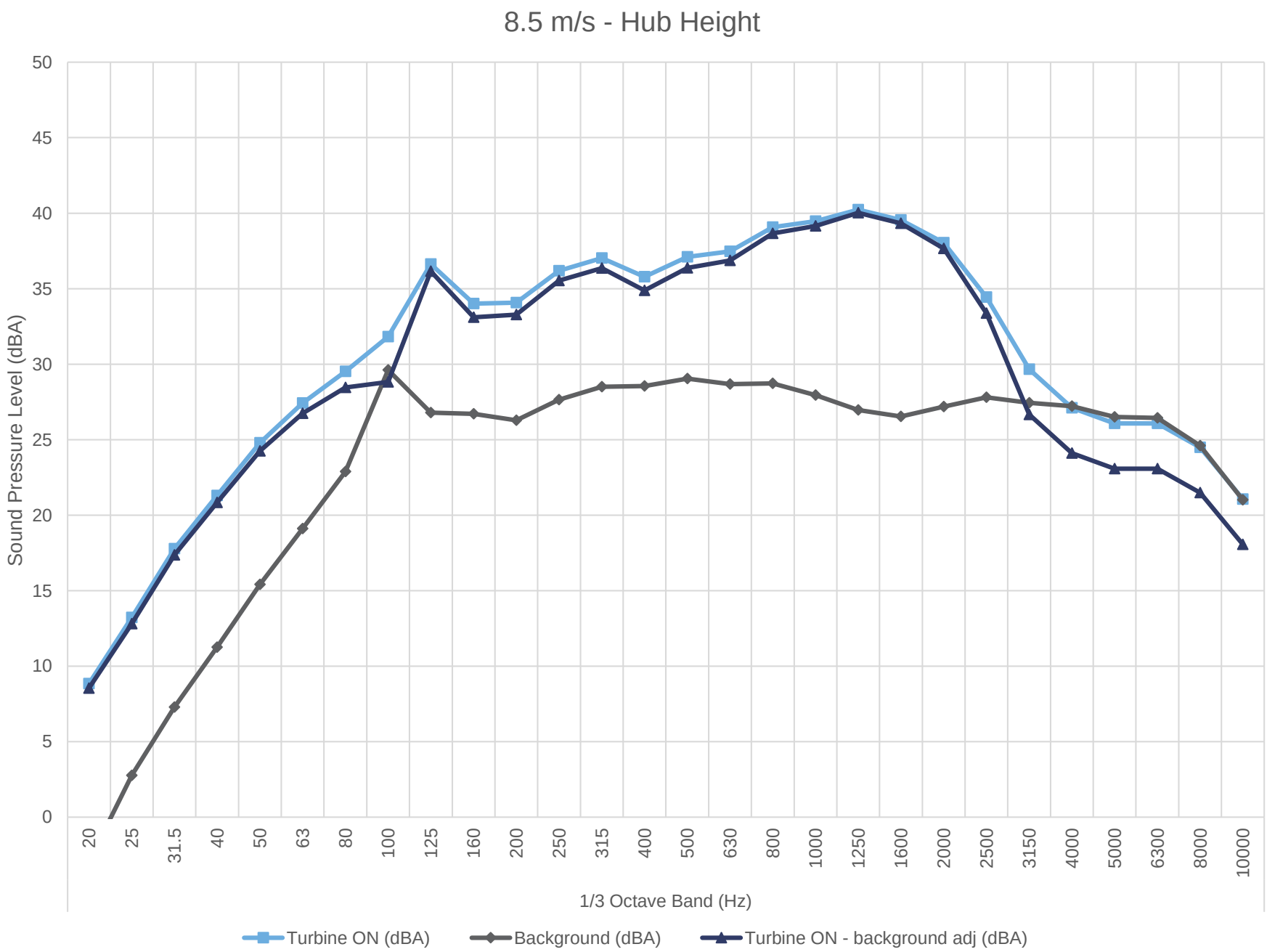
Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
	Figure Title Plot of sound pressure spectrum at 1/3 Octave at 8.0 m/s

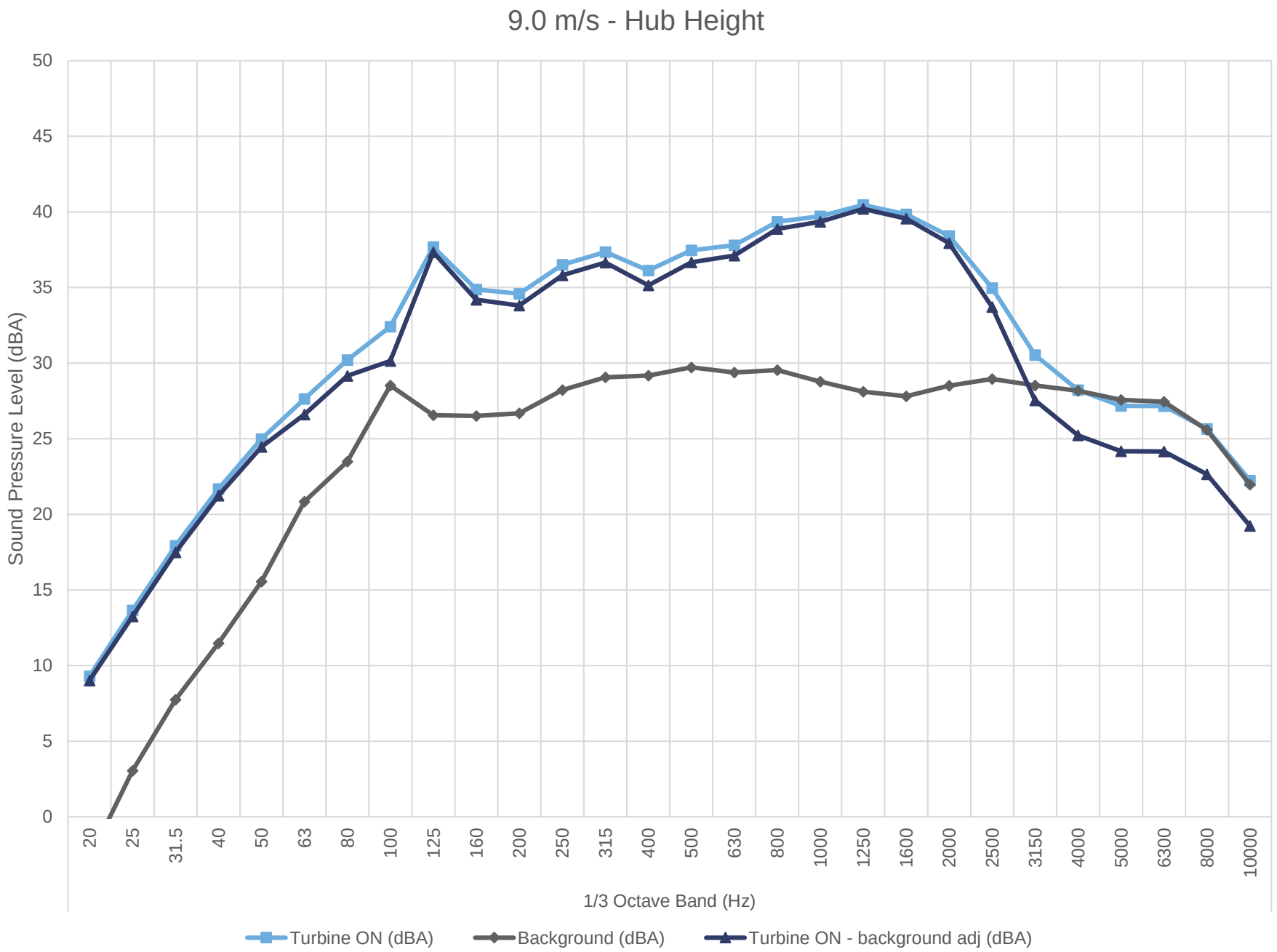
Figure C.05



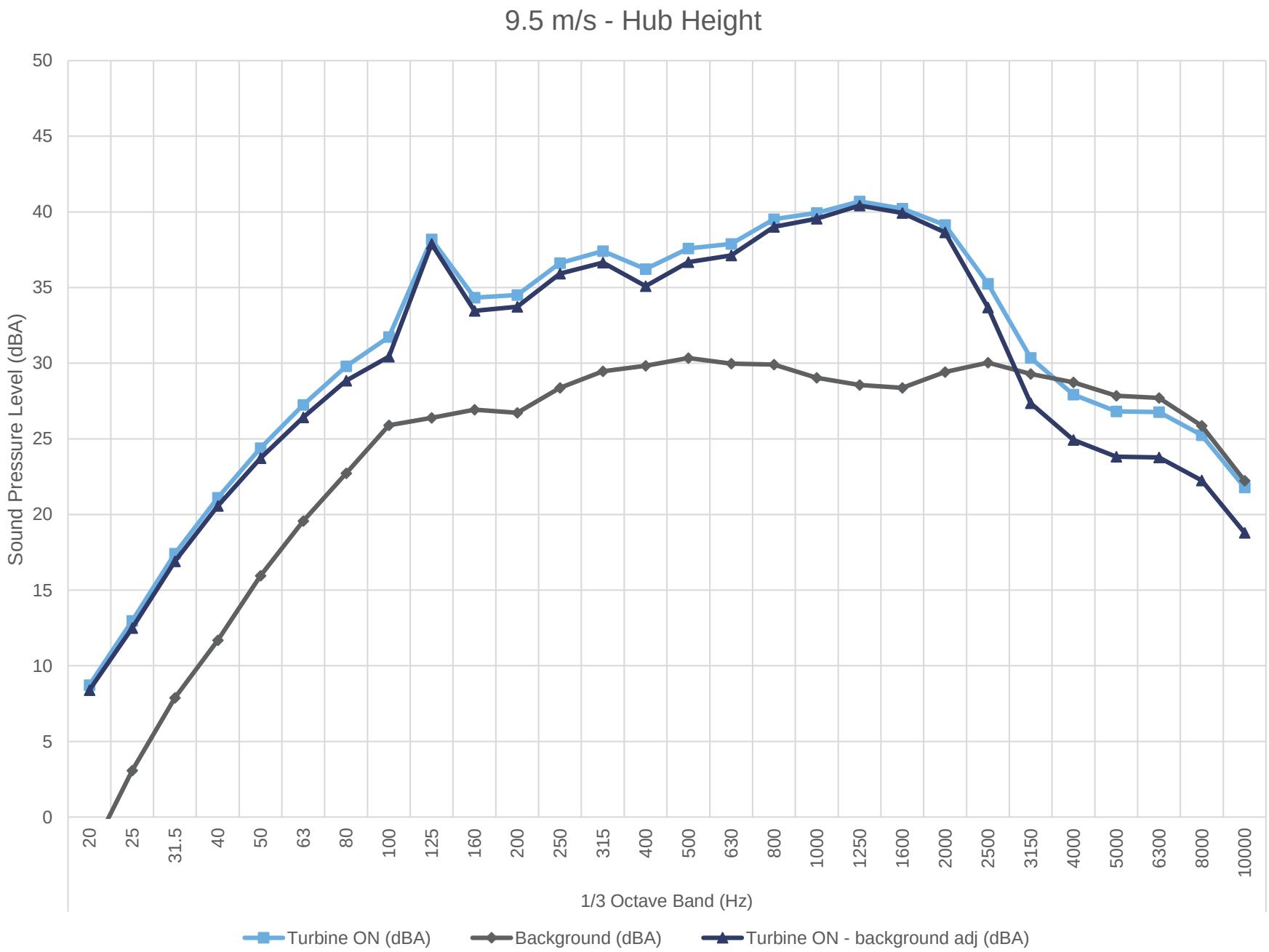
aercoustics

16115.01.T12.RP3	**Project Name**
Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
	Figure Title Plot of sound pressure spectrum at 1/3 Octave at 8.5 m/s

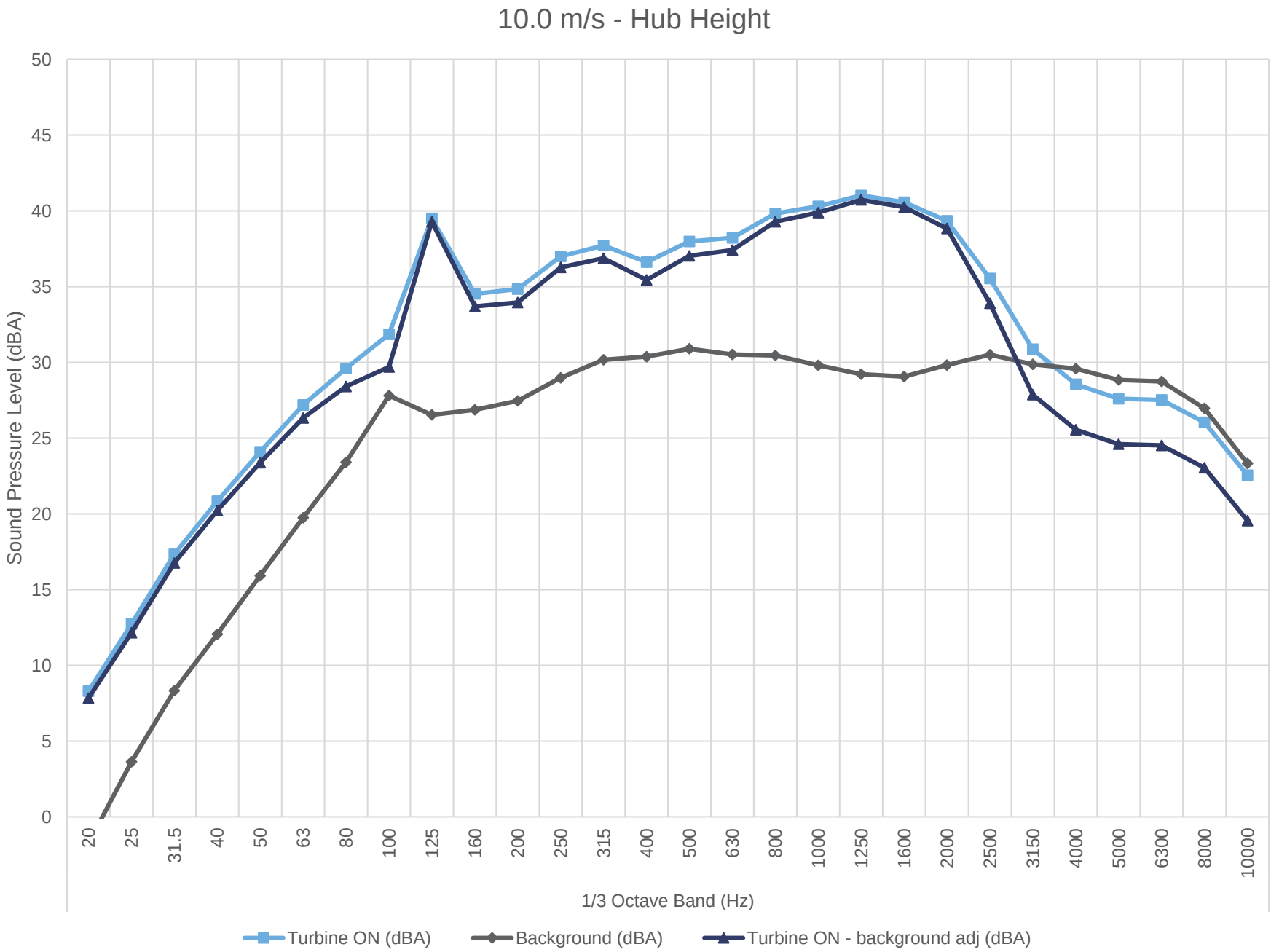
Figure C.06



aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of sound pressure spectrum at 1/3 Octave at 9.0 m/s
		Figure C.07

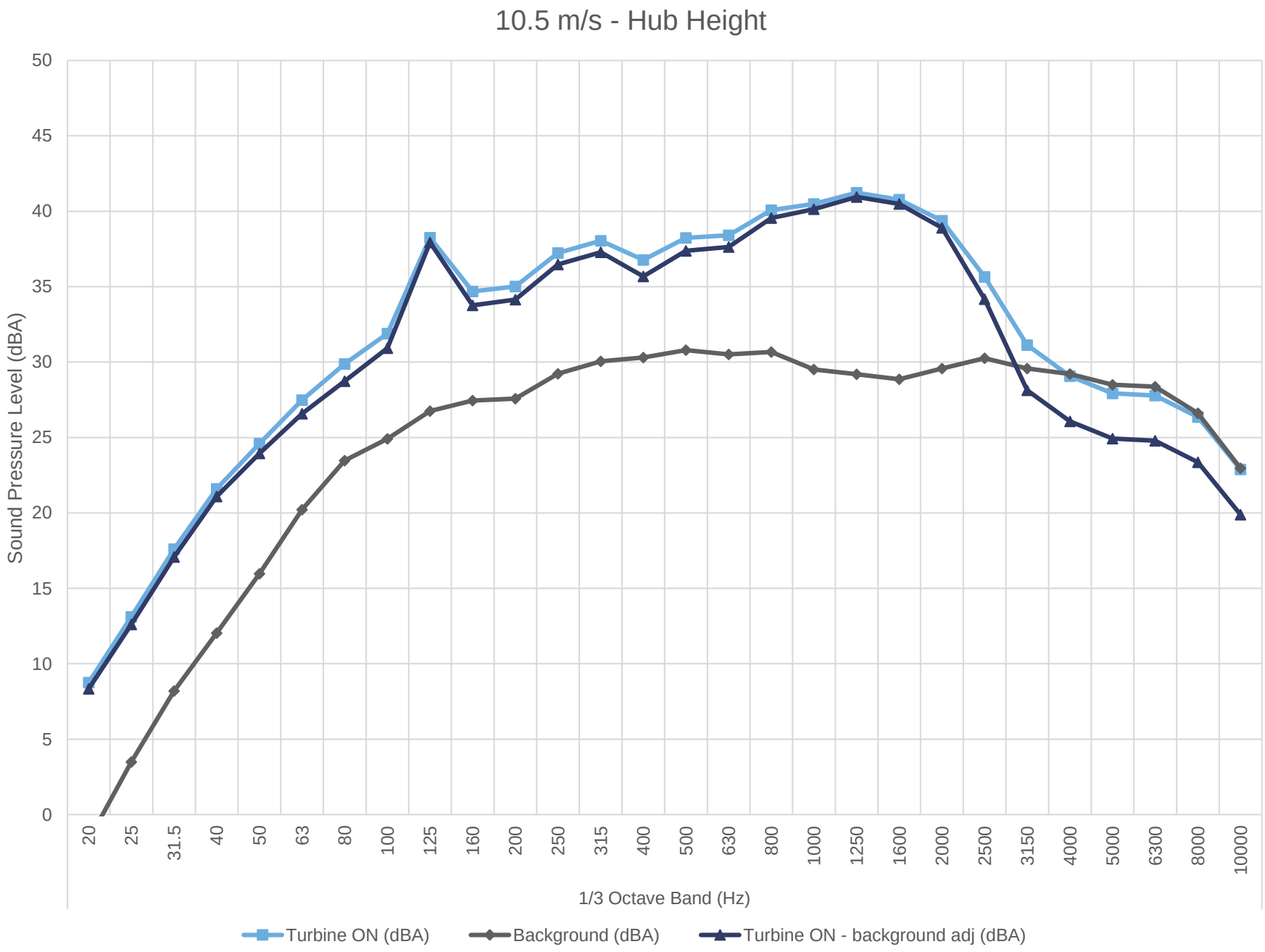


aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of sound pressure spectrum at 1/3 Octave at 9.5 m/s
		Figure C.08

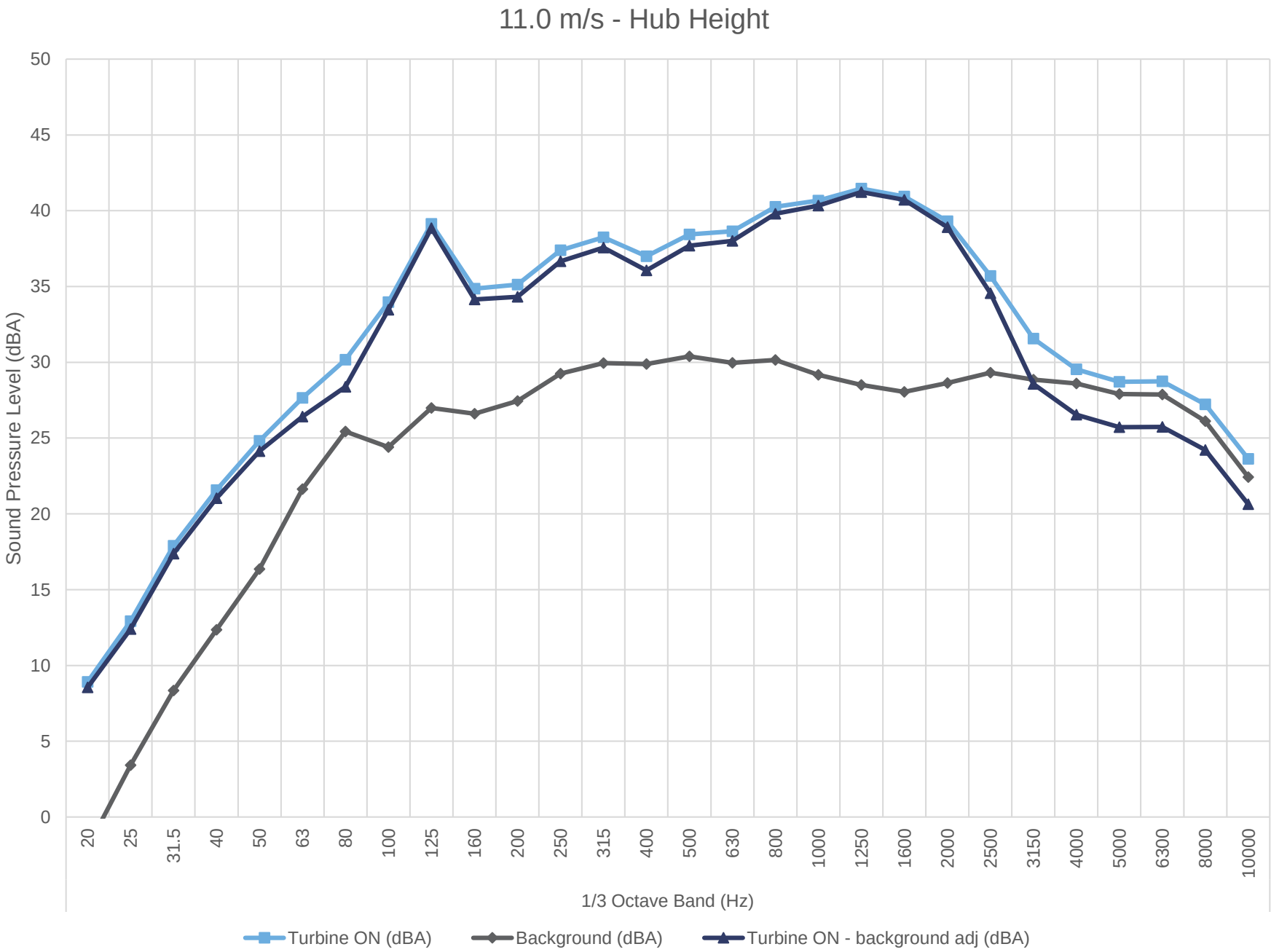


aercoustics	16115.01.T12.RP3 Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	**Project Name** Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12 **Figure Title** Plot of sound pressure spectrum at 1/3 Octave at 10.0 m/s

Figure C.09



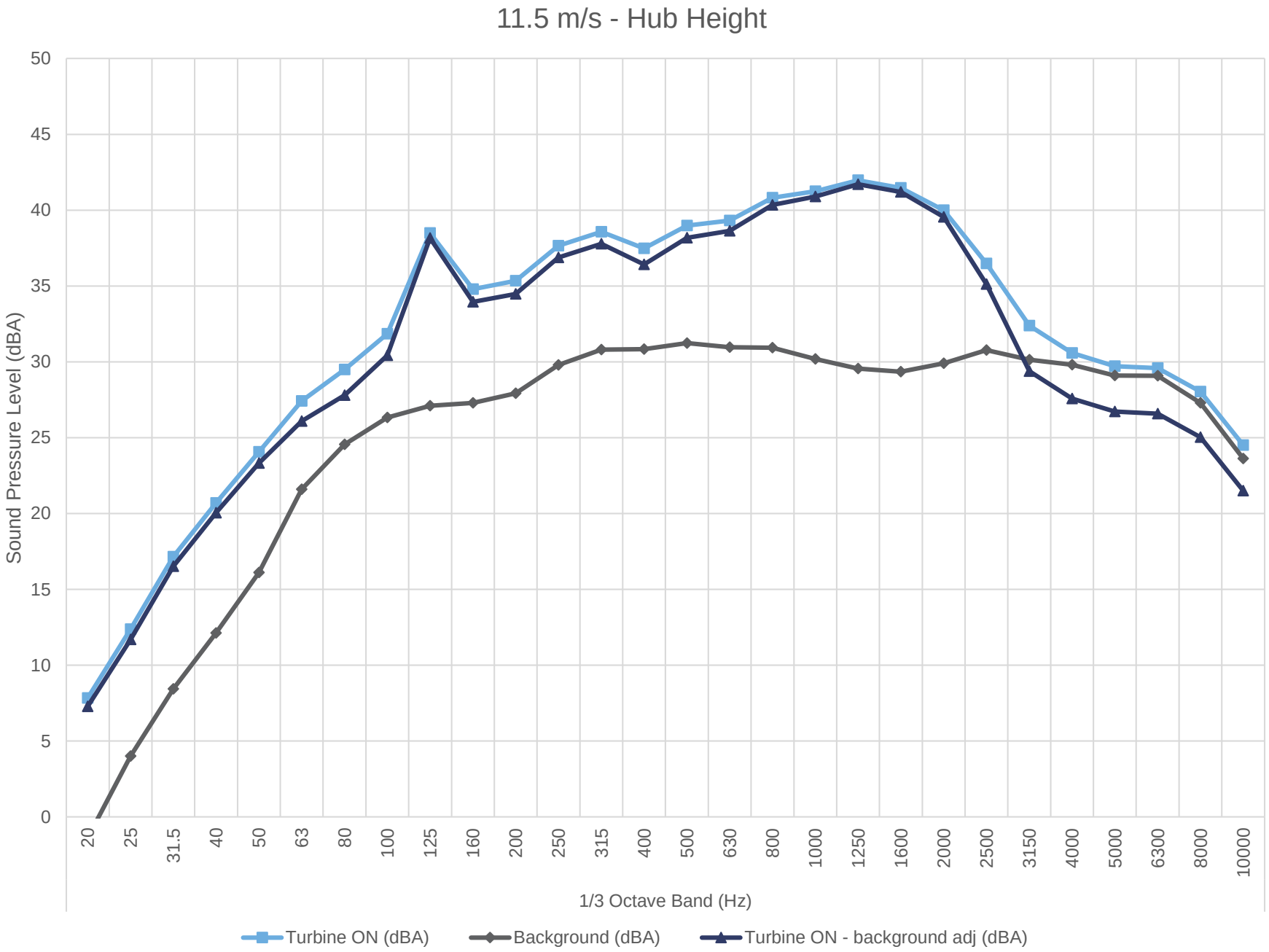
aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of sound pressure spectrum at 1/3 Octave at 10.5 m/s
		Figure C.10



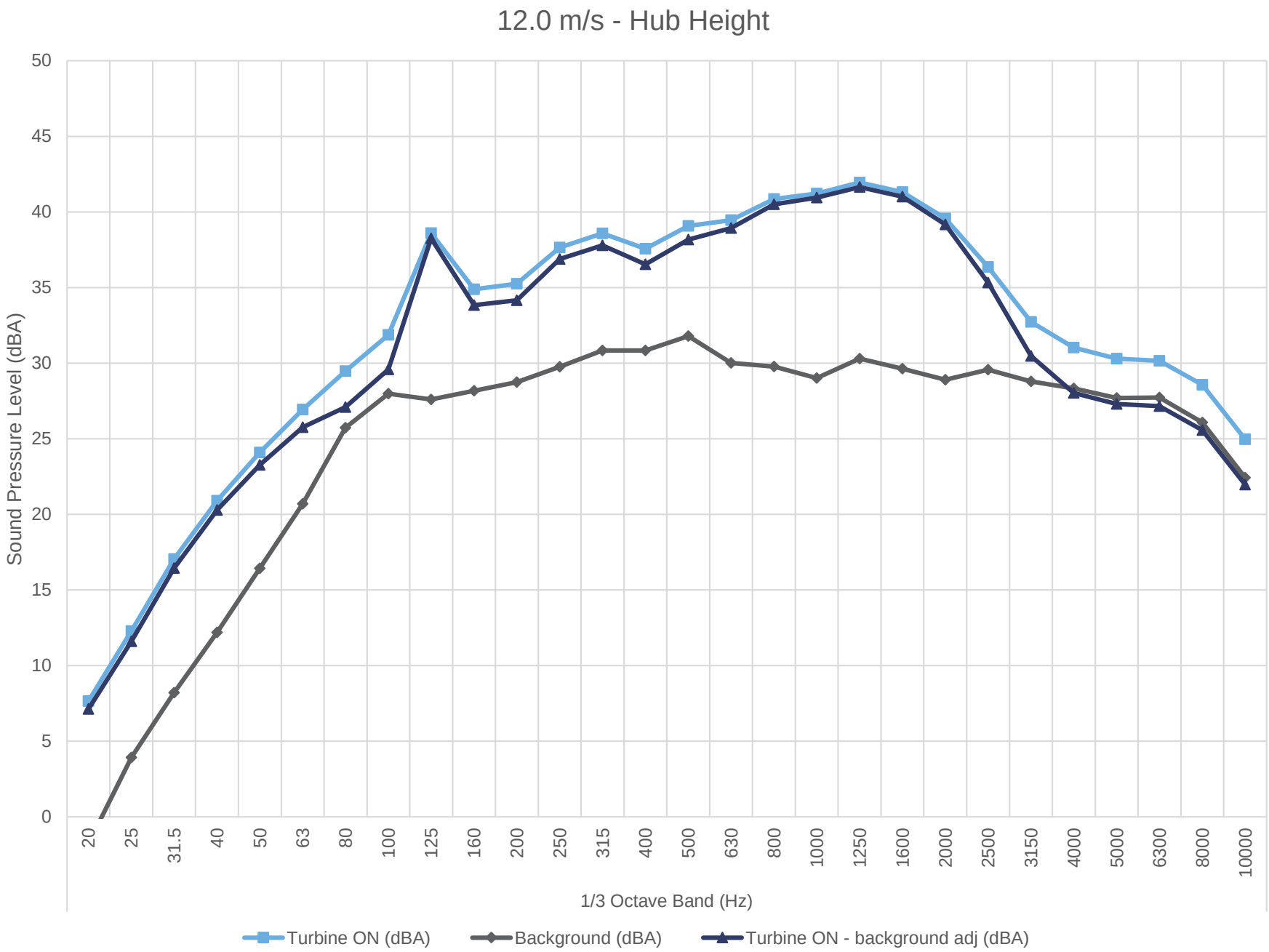
aercoustics

16115.01.T12.RP3	**Project Name**
Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
	Figure Title Plot of sound pressure spectrum at 1/3 Octave at 11.0 m/s

Figure C.11

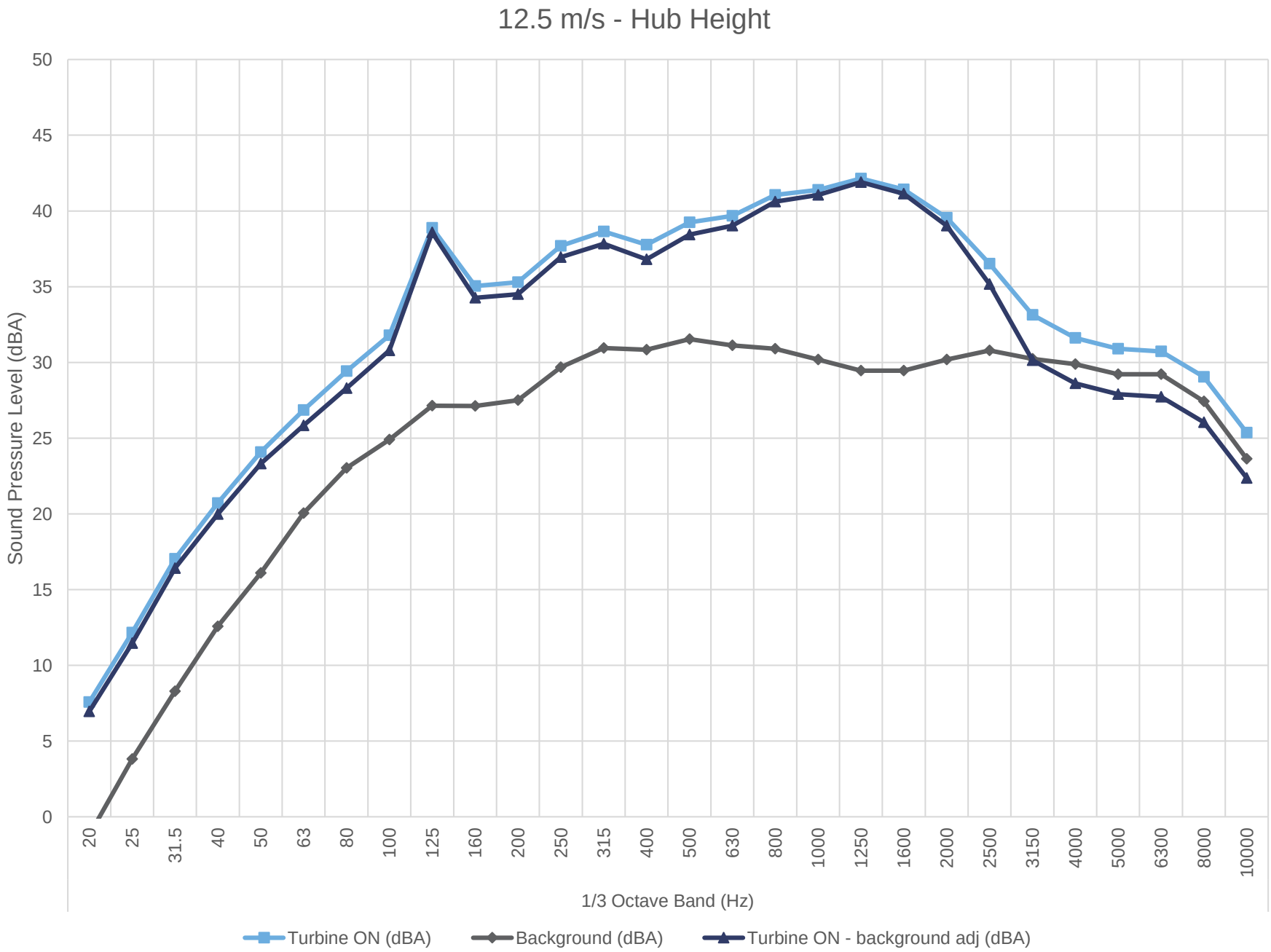


aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of sound pressure spectrum at 1/3 Octave at 11.5 m/s
		Figure C.12



aercoustics	16115.01.T12.RP3 Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	**Project Name** Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12 **Figure Title** Plot of sound pressure spectrum at 1/3 Octave at 12.0 m/s

Figure C.13



aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of sound pressure spectrum at 1/3 Octave at 12.5 m/s

Figure C.14

Table C.01 Detailed apparent sound power level data at hub height

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-12

1/3 Octave values marked with brackets [ ] denote less than 3 dB difference between Turbine ON and Background

Overall levels marked with an asterisk * denote 3 to 6 dB difference between Turbine ON and Background, while Overall values with less than 3 dB difference between Turbine ON and Background are not reported

Wind Bin (m/s)	Parameter	1/3 Octave Band (Hz)																													Overall
		20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
8.0	Turbine ON (dBA)	8.4	12.7	17.5	21.4	24.3	27.0	29.3	31.4	34.9	33.7	33.7	35.8	36.6	35.4	36.7	37.1	38.6	39.0	39.7	39.0	37.3	33.8	29.2	26.9	26.0	26.0	24.4	20.9	48.8
	Background (dBA)	-3.3	2.6	6.8	10.8	14.7	19.5	22.9	24.7	28.8	25.4	25.8	27.3	27.9	27.9	28.4	28.2	28.5	27.8	27.1	26.6	27.2	27.8	27.4	27.2	26.4	26.4	24.6	21.0	40.4
	Turbine ON - background adj (dBA)	8.1	12.3	17.2	20.9	23.8	26.1	28.2	30.3	33.7	33.0	33.0	35.1	35.9	34.6	36.0	36.5	38.2	38.7	39.5	38.8	36.8	32.5	[26.2]	[23.9]	[23]	[23]	[21.4]	[17.9]	48.2
	Signal to noise (dB)	11.6	10.1	10.7	10.5	9.6	7.5	6.4	6.7	6.1	8.3	8.0	8.4	8.6	7.5	8.3	8.9	10.1	11.2	12.6	12.5	10.0	6.0	1.8	-0.3	-0.4	-0.4	-0.2	-0.1	8.4
	Uncertainty (dB)	2.3	2.0	1.3	1.8	1.3	1.3	1.3	1.2	1.2	1.1	0.9	0.9	0.9	1.0	0.9	0.9	0.8	0.9	0.9	0.9	1.0	1.3	2.6	2.7	2.8	2.9	3.5	4.2	1.0
	PWL (dBA)	61.2	65.4	70.3	74.0	76.9	79.2	81.3	83.4	86.8	86.1	86.1	88.2	89.0	87.7	89.1	89.6	91.3	91.8	92.6	91.9	89.9	85.6	[79.3]	[77]	[76.1]	[76.1]	[74.5]	[71]	101.3
8.5	Turbine ON (dBA)	8.8	13.2	17.8	21.3	24.8	27.4	29.5	31.8	36.6	34.0	34.1	36.2	37.0	35.8	37.1	37.5	39.1	39.5	40.2	39.5	38.0	34.4	29.7	27.1	26.1	26.1	24.5	21.1	49.3
	Background (dBA)	-2.9	2.8	7.3	11.2	15.4	19.1	22.9	29.6	26.8	26.7	26.3	27.7	28.5	28.5	29.0	28.7	28.7	28.0	27.0	26.5	27.2	27.8	27.4	27.2	26.5	26.4	24.6	21.0	40.8
	Turbine ON - background adj (dBA)	8.5	12.8	17.4	20.8	24.3	26.7	28.5	[28.8]	36.2	33.1	33.3	35.5	36.4	34.9	36.4	36.9	38.7	39.2	40.0	39.3	37.7	33.4	[26.7]	[24.1]	[23.1]	[23.1]	[21.5]	[18.1]	48.7
	Signal to noise (dB)	11.8	10.4	10.5	10.0	9.4	8.3	6.6	2.2	9.8	7.3	7.8	8.5	8.5	7.2	8.1	8.8	10.3	11.5	13.3	13.0	10.9	6.6	2.2	-0.1	-0.4	-0.4	-0.1	0.0	8.5
	Uncertainty (dB)	2.1	1.8	1.2	1.7	1.2	1.1	1.1	2.0	1.0	1.0	0.9	0.8	0.8	0.9	0.8	0.8	0.7	0.8	0.8	0.8	0.9	1.1	2.5	2.7	2.7	2.8	3.3	4.0	0.9
	PWL (dBA)	61.6	65.9	70.5	73.9	77.4	79.8	81.6	[81.9]	89.3	86.2	86.4	88.6	89.5	88.0	89.5	90.0	91.8	92.3	93.1	92.4	90.8	86.5	[79.8]	[77.2]	[76.2]	[76.2]	[74.6]	[71.2]	101.8
9.0	Turbine ON (dBA)	9.3	13.6	17.9	21.7	25.0	27.6	30.2	32.4	37.7	34.9	34.6	36.5	37.4	36.1	37.5	37.8	39.4	39.7	40.5	39.8	38.4	35.0	30.5	28.2	27.2	27.2	25.7	22.2	49.7
	Background (dBA)	-2.8	3.1	7.7	11.5	15.6	20.8	23.5	28.5	26.6	26.5	26.7	28.2	29.1	29.2	29.7	29.4	29.5	28.8	28.1	27.8	28.5	29.0	28.5	28.2	27.6	27.4	25.6	22.0	41.5
	Turbine ON - background adj (dBA)	9.0	13.3	17.5	21.2	24.5	26.6	29.2	30.1	37.3	34.2	33.8	35.8	36.7	35.1	36.7	37.1	38.9	39.4	40.2	39.6	37.9	33.7	[27.5]	[25.2]	[24.2]	[24.2]	[22.7]	[19.2]	49.1
	Signal to noise (dB)	12.1	10.6	10.2	10.2	9.4	6.8	6.7	3.9	11.1	8.4	7.9	8.3	8.3	6.9	7.7	8.4	9.8	10.9	12.4	12.0	9.9	6.0	2.0	0.1	-0.4	-0.3	0.1	0.3	8.2
	Uncertainty (dB)	2.0	1.7	1.1	1.6	1.2	1.2	1.0	1.5	0.9	1.0	0.8	0.8	0.8	0.9	0.8	0.8	0.7	0.8	0.8	0.8	0.8	1.1	2.3	2.4	2.4	2.5	3.1	3.7	0.9
	PWL (dBA)	62.1	66.4	70.6	74.3	77.6	79.7	82.3	83.2	90.4	87.3	86.9	88.9	89.8	88.2	89.8	90.2	92.0	92.5	93.3	92.7	91.0	86.8	[80.6]	[78.3]	[77.3]	[77.3]	[75.8]	[72.3]	102.2
9.5	Turbine ON (dBA)	8.7	13.0	17.4	21.1	24.4	27.2	29.8	31.7	38.2	34.3	34.5	36.6	37.4	36.2	37.6	37.9	39.5	39.9	40.7	40.2	39.1	35.2	30.4	27.9	26.8	26.8	25.2	21.8	49.9
	Background (dBA)	-2.6	3.1	7.9	11.7	16.0	19.6	22.7	25.9	26.4	26.9	26.7	28.4	29.5	29.8	30.3	30.0	29.9	29.0	28.6	28.4	29.4	30.0	29.3	28.7	27.8	27.7	25.9	22.2	41.8
	Turbine ON - background adj (dBA)	8.4	12.5	16.9	20.6	23.7	26.4	28.9	30.4	37.9	33.5	33.7	35.9	36.7	35.1	36.7	37.1	39.0	39.6	40.4	39.9	38.6	33.7	[27.4]	[24.9]	[23.8]	[23.8]	[22.2]	[18.8]	49.2
	Signal to noise (dB)	11.3	9.9	9.5	9.4	8.4	7.7	7.1	5.8	11.8	7.4	7.8	8.3	8.0	6.4	7.2	7.9	9.6	10.9	12.1	11.9	9.7	5.2	1.1	-0.8	-1.0	-0.9	-0.6	-0.5	8.1
	Uncertainty (dB)	2.2	1.9	1.2	1.7	1.3	1.2	1.1	1.2	0.9	1.0	0.8	0.9	0.8	1.0	0.9	0.9	0.8	0.8	0.9	0.8	0.8	1.3	2.4	2.5	2.5	2.6	3.2	3.9	0.9
	PWL (dBA)	61.5	65.6	70.0	73.7	76.8	79.5	82.0	83.5	91.0	86.6	86.8	89.0	89.8	88.2	89.8	90.2	92.1	92.7	93.5	93.0	91.7	86.8	[80.5]	[78]	[76.9]	[76.9]	[75.3]	[71.9]	102.3
10.0	Turbine ON (dBA)	8.3	12.7	17.3	20.8	24.1	27.2	29.6	31.9	39.5	34.5	34.8	37.0	37.7	36.6	38.0	38.2	39.8	40.3	41.0	40.6	39.4	35.5	30.9	28.6	27.6	27.5	26.0	22.6	50.3
	Background (dBA)	-1.7	3.6	8.3	12.1	15.9	19.7	23.4	27.8	26.5	26.9	27.5	29.0	30.2	30.4	30.9	30.5	30.5	29.8	29.2	29.1	29.8	30.5	29.9	29.6	28.8	28.7	27.0	23.3	42.5
	Turbine ON - background adj (dBA)	7.8	12.2	16.8	20.2	23.4	26.3	28.4	29.7	39.3	33.7	34.0	36.3	36.9	35.4	37.0	37.4	39.3	39.9	40.7	40.2	38.8	33.9	[27.9]	[25.6]	[24.6]	[24.5]	[23]	[19.6]	49.6
	Signal to noise (dB)	10.0	9.1	9.0	8.8	8.2	7.4	6.2	4.1	13.0	7.6	7.4	8.0	7.5	6.2	7.1	7.7	9.4	10.5	11.8	11.5	9.5	5.0	1.0	-1.0	-1.2	-1.2	-0.9	-0.8	7.8
	Uncertainty (dB)	2.1	1.8	1.2	1.7	1.3	1.2	1.1	1.5	1.0	1.0	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	1.2	2.4	2.4	2.4	2.5	3.1	3.8	0.9
	PWL (dBA)	60.9	65.3	69.9	73.3	76.5	79.4	81.5	82.8	92.4	86.8	87.1	89.4	90.0	88.5	90.1	90.5	92.4	93.0	93.8	93.3	91.9	87.0	[81]	[78.7]	[77.7]	[77.6]	[76.1]	[72.7]	102.7
10.5	Turbine ON (dBA)	8.8	13.1	17.6	21.6	24.6	27.5	29.9	31.9	38.3	34.7	35.0	37.2	38.0	36.8	38.2	38.4	40.1	40.5	41.2	40.8	39.4	35.7	31.1	29.1	27.9	27.8	26.4	22.9	50.4
	Background (dBA)	-1.7	3.5	8.2	12.0	16.0	20.2	23.5	24.9	26.8	27.4	27.6	29.2	30.1	30.3	30.8	30.5	30.7	29.5	29.2	28.9	29.6	30.3	29.6	29.2	28.5	28.4	26.6	23.0	42.3
	Turbine ON - background adj (dBA)	8.3	12.6	17.1	21.1	24.0	26.6	28.7	30.9	37.9	33.8	34.1	36.5	37.3	35.7	37.4	37.6	39.5	40.1	41.0	40.5	38.9	34.2	[28.1]	[26.1]	[24.9]	[24.8]	[23.4]	[19.9]	49.7
	Signal to noise (dB)	10.4	9.6	9.4	9.6	8.6	7.3	6.4	7.0	11.5	7.2	7.4	8.0	8.0	6.5	7.4	7.9	9.4	11.0	12.0	11.9	9.8	5.4	1.6	-0.1	-0.6	-0.6	-0.3	-0.1	8.1
	Uncertainty (dB)	2.2	1.9	1.2	1.7	1.3	1.2	1.1	1.1	0.9	1.0	0.9	0.9	0.8	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	1.2	2.5	2.6	2.6	2.7	3.3	3.9	0.9
	PWL (dBA)	61.4	65.7	70.2	74.2	77.1	79.7	81.8	84.0	91.0	86.9	87.2	89.6	90.4	88.8	90.5	90.7	92.6	93.2	94.1	93.6	92.0	87.3	[81.2]	[79.2]	[78]	[77.9]	[76.5]	[73]	102.8
11.0	Turbine ON (dBA)	8.9	12.9	17.9	21.6	24.8	27.7	30.2	34.0	39.1	34.9	35.1	37.4	38.3	37.0	38.4	38.6	40.3	40.7	41.5	40.9	39.3	35.7	31.6	29.5	28.7	28.7	27.2	23.6	50.6
	Background (dBA)	-2.0	3.4	8.3	12.3	16.4	21.6	25.4	24.4	27.0	26.6	27.4	29.2	29.9	29.9	30.4	30.0	30.2	29.2	28.5	28.1	28.6	29.3	28.9	28.6	27.9	27.9	26.1	22.4	41.9
	Turbine ON - background adj (dBA)	8.5	12.4	17.4	21.0	24.1	26.4	28.4	33.5	38.9	34.1	34.3	36.7	37.6	36.1	37.7	38.0	39.8	40.3	41.2	40.7	38.9	34.6	[28.6]	[26.5]	[25.7]	[25.7]	[24.2]	[20.6]	50.1
	Signal to noise (dB)	10.9	9.5	9.5	9.2	8.4	6.0	4.7	9.6	12.1	8.2	7.7	8.1	8.3	7.1	8.0	8.7	10.1	11.5	12.9	12.9	10.7	6.4	2.7	0.9	0.8	0.9	1.1	1.2	8.8
	Uncertainty (dB)	2.1	1.8	1.2	1.7	1.3	1.3	1.4	1.2	1.1	1.0	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.1	2.5	2.5	2.4	2.6	3.1	3.8	0.9
	PWL (dBA)	61.6	65.5	70.5	74.1	77.2	79.5	81.5	86.6	92.0	87.2	87.4	89.8	90.7	89.2	90.8	91.1	92.9	93.4	94.3	93.8	92.0	87.7	[81.7]	[79.6]	[78.8]	[78.8]	[77.3]	[73.7]	103.2

Table C.01 Detailed apparent sound power level data at hub height

1/3 Octave values marked with brackets [ ] denote less than 3 dB difference between Turbine ON and Background
Overall levels marked with an asterisk * denote 3 to 6 dB difference between Turbine ON and Background, while Overall values with less than 3 dB difference between Turbine ON and Background are not reported

Wind Bin (m/s)	Parameter	1/3 Octave Band (Hz)																													Overall
		20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
11.5	Turbine ON (dBA)	7.8	12.4	17.1	20.7	24.1	27.4	29.5	31.9	38.5	34.8	35.3	37.7	38.6	37.5	39.0	39.3	40.8	41.3	42.0	41.5	40.0	36.5	32.4	30.6	29.7	29.6	28.0	24.5		51.0
	Background (dBA)	-1.4	4.0	8.4	12.1	16.1	21.6	24.6	26.3	27.1	27.3	27.9	29.8	30.8	30.8	31.2	31.0	30.9	30.2	29.6	29.4	29.9	30.8	30.1	29.8	29.1	29.1	27.3	23.6		42.8
	Turbine ON - background adj (dBA)	7.3	11.7	16.5	20.0	23.3	26.1	27.8	30.4	38.2	33.9	34.5	36.9	37.8	36.4	38.2	38.6	40.3	40.9	41.7	41.2	39.6	35.1	[29.4]	[27.6]	[26.7]	[26.6]	[25]	[21.5]		50.4
	Signal to noise (dB)	9.2	8.4	8.7	8.6	8.0	5.8	4.9	5.5	11.4	7.5	7.4	7.9	7.8	6.6	7.7	8.4	9.9	11.1	12.4	12.1	10.1	5.7	2.2	0.8	0.6	0.5	0.7	0.9		8.2
	Uncertainty (dB)	2.1	1.8	1.2	1.7	1.2	1.3	1.2	1.1	0.8	1.0	0.8	0.8	0.8	0.9	0.8	0.8	0.7	0.8	0.8	0.8	0.8	1.1	2.4	2.4	2.3	2.4	3.0	3.7		0.9
	PWL (dBA)	60.4	64.8	69.6	73.1	76.4	79.2	80.9	83.5	91.3	87.0	87.6	90.0	90.9	89.5	91.3	91.7	93.4	94.0	94.8	94.3	92.7	88.2	[82.5]	[80.7]	[79.8]	[79.7]	[78.1]	[74.6]		103.5
12.0	Turbine ON (dBA)	7.7	12.3	17.1	20.9	24.1	26.9	29.5	31.9	38.6	34.9	35.3	37.7	38.6	37.6	39.1	39.5	40.9	41.2	42.0	41.3	39.6	36.4	32.7	31.0	30.3	30.2	28.6	25.0		51.0
	Background (dBA)	-1.8	3.9	8.2	12.2	16.4	20.7	25.7	28.0	27.6	28.2	28.7	29.8	30.8	30.8	31.8	30.0	29.8	29.0	30.3	29.6	28.9	29.6	28.8	28.3	27.7	27.7	26.1	22.4		42.5
	Turbine ON - background adj (dBA)	7.1	11.6	16.4	20.3	23.3	25.8	27.1	29.6	38.2	33.8	34.2	36.9	37.8	36.5	38.2	38.9	40.5	40.9	41.6	41.0	39.2	35.3	30.5	[28]	[27.3]	[27.2]	[25.6]	[22]		50.4
	Signal to noise (dB)	9.4	8.4	8.8	8.7	7.7	6.2	3.7	3.9	11.0	6.7	6.5	7.9	7.8	6.7	7.3	9.4	11.1	12.2	11.6	11.7	10.7	6.8	3.9	2.7	2.6	2.4	2.5	2.5		8.6
	Uncertainty (dB)	2.2	1.9	1.2	1.8	1.3	1.3	1.7	1.7	0.9	1.1	0.9	0.9	0.8	0.9	0.9	0.8	0.8	0.8	0.9	0.8	0.8	1.1	2.0	2.5	2.4	2.6	3.1	3.8		0.9
	PWL (dBA)	60.2	64.7	69.5	73.4	76.4	78.9	80.2	82.7	91.3	86.9	87.3	90.0	90.9	89.6	91.3	92.0	93.6	94.0	94.7	94.1	92.3	88.4	83.6	[81.1]	[80.4]	[80.3]	[78.7]	[75.1]		103.5
12.5	Turbine ON (dBA)	7.6	12.2	17.0	20.7	24.1	26.9	29.4	31.8	38.9	35.0	35.3	37.7	38.6	37.8	39.2	39.7	41.0	41.4	42.1	41.4	39.6	36.5	33.1	31.6	30.9	30.7	29.0	25.4		51.2
	Background (dBA)	-1.2	3.8	8.3	12.6	16.1	20.0	23.0	24.9	27.1	27.1	27.5	29.7	31.0	30.8	31.5	31.1	30.9	30.2	29.5	29.4	30.2	30.8	30.2	29.9	29.2	29.2	27.4	23.6		42.8
	Turbine ON - background adj (dBA)	6.9	11.5	16.4	20.0	23.3	25.8	28.3	30.8	38.6	34.3	34.5	37.0	37.8	36.8	38.4	39.0	40.6	41.1	41.9	41.1	39.0	35.2	[30.1]	[28.6]	[27.9]	[27.7]	[26]	[22.4]		50.6
	Signal to noise (dB)	8.8	8.3	8.7	8.1	8.0	6.8	6.4	6.9	11.7	7.9	7.8	8.0	7.7	6.9	7.7	8.6	10.1	11.2	12.7	12.0	9.4	5.7	2.9	1.7	1.7	1.5	1.6	1.7		8.4
	Uncertainty (dB)	2.3	1.9	1.2	1.8	1.3	1.2	1.1	1.1	0.9	1.0	0.8	0.9	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	1.2	2.6	2.6	2.5	2.7	3.2	3.9		0.9
	PWL (dBA)	60.0	64.6	69.5	73.1	76.4	78.9	81.4	83.9	91.7	87.4	87.6	90.1	90.9	89.9	91.5	92.1	93.7	94.2	95.0	94.2	92.1	88.3	[83.2]	[81.7]	[81]	[80.8]	[79.1]	[75.5]		103.7

Table C.02 Detailed apparent sound power level data at 10m height

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-29

1/3 Octave values marked with brackets [ ] denote less than 3 dB difference between Turbine ON and Background

Overall levels marked with an asterisk * denote 3 to 6 dB difference between Turbine ON and Background, while Overall values with less than 3 dB difference between Turbine ON and Background are not reported

Wind Bin (m/s)	Parameter	1/3 Octave Band (Hz)																													Overall
		20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
5.0	Turbine ON (dBA)	7.5	12.0	16.9	20.5	23.5	26.0	28.3	30.4	33.2	32.8	33.1	35.2	36.1	35.0	36.2	36.6	38.3	38.6	39.4	38.7	36.6	33.0	28.3	25.7	24.7	24.7	23.1	19.6	48.2
	Background (dBA)	-3.5	2.5	6.7	10.8	14.7	19.4	22.8	24.7	28.9	25.7	25.6	27.2	28.0	27.6	28.1	28.0	28.3	27.6	26.6	25.9	26.5	27.2	26.7	26.6	25.9	25.8	24.0	20.4	40.1
	Turbine ON - background adj (dBA)	7.1	11.5	16.5	20.0	22.9	24.9	26.9	29.1	31.2	31.9	32.3	34.4	35.3	34.1	35.5	36.0	37.8	38.3	39.1	38.5	36.1	31.7	[25.3]	[22.7]	[21.7]	[21.7]	[20.1]	[16.6]	47.6
	Signal to noise (dB)	11.0	9.6	10.2	9.7	8.9	6.6	5.5	5.8	4.3	7.1	7.5	8.0	8.1	7.4	8.1	8.6	9.9	11.1	12.8	12.8	10.1	5.9	1.6	-0.9	-1.1	-1.1	-0.9	-0.8	8.1
	Uncertainty (dB)	3.2	2.8	1.8	2.6	1.9	1.9	1.7	1.7	2.0	1.6	1.3	1.3	1.2	1.3	1.2	1.3	1.2	1.2	1.3	1.2	1.3	1.7	3.5	3.8	3.8	4.0	4.7	5.7	1.3
	PWL (dBA)	60.2	64.6	69.6	73.1	76.0	78.0	80.0	82.2	84.3	85.0	85.4	87.5	88.4	87.2	88.6	89.1	90.9	91.4	92.2	91.6	89.2	84.8	[78.4]	[75.8]	[74.8]	[74.8]	[73.2]	[69.7]	100.7
6.0	Turbine ON (dBA)	8.8	13.2	17.6	21.3	24.6	27.3	29.8	31.8	37.2	34.3	34.3	36.3	37.2	36.0	37.3	37.6	39.2	39.6	40.4	39.8	38.4	34.7	30.0	27.6	26.5	26.5	25.0	21.5	49.5
	Background (dBA)	-2.8	3.0	7.6	11.4	15.5	20.0	23.0	28.0	26.6	26.6	26.5	28.1	29.0	29.1	29.6	29.3	29.3	28.6	27.9	27.6	28.3	28.9	28.4	28.0	27.3	27.2	25.4	21.7	41.3
	Turbine ON - background adj (dBA)	8.5	12.7	17.1	20.8	24.0	26.4	28.8	29.6	36.8	33.5	33.5	35.6	36.5	35.0	36.5	36.9	38.8	39.3	40.1	39.5	37.9	33.4	[27]	[24.6]	[23.5]	[23.5]	[22]	[18.5]	48.9
	Signal to noise (dB)	11.6	10.2	10.0	9.9	9.1	7.3	6.8	3.9	10.6	7.7	7.8	8.3	8.2	6.9	7.7	8.3	9.9	11.1	12.5	12.2	10.1	5.9	1.6	-0.4	-0.8	-0.7	-0.4	-0.2	8.2
	Uncertainty (dB)	1.8	1.6	1.0	1.5	1.1	1.0	0.9	1.3	0.8	0.9	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1.0	2.1	2.2	2.1	2.2	2.8	3.4	0.8
	PWL (dBA)	61.6	65.8	70.2	73.9	77.1	79.5	81.9	82.7	89.9	86.6	86.6	88.7	89.6	88.1	89.6	90.0	91.9	92.4	93.2	92.6	91.0	86.5	[80.1]	[77.7]	[76.6]	[76.6]	[75.1]	[71.6]	102.0
7.0	Turbine ON (dBA)	8.5	12.9	17.5	21.3	24.4	27.4	29.8	32.5	39.0	34.6	35.0	37.2	37.9	36.8	38.2	38.4	40.0	40.5	41.2	40.7	39.4	35.6	31.1	29.0	28.0	27.9	26.4	22.9	50.4
	Background (dBA)	-1.8	3.5	8.2	12.1	16.2	20.3	23.7	26.9	26.7	27.1	27.4	29.0	30.0	30.3	30.8	30.4	30.5	29.6	29.1	28.8	29.6	30.3	29.6	29.3	28.5	28.4	26.6	23.0	42.3
	Turbine ON - background adj (dBA)	8.1	12.3	17.0	20.7	23.7	26.4	28.6	31.1	38.7	33.8	34.1	36.4	37.2	35.7	37.3	37.6	39.5	40.1	40.9	40.5	38.9	34.1	[28.1]	[26]	[25]	[24.9]	[23.4]	[19.9]	49.8
	Signal to noise (dB)	10.3	9.3	9.3	9.2	8.2	7.1	6.1	5.6	12.3	7.6	7.5	8.1	7.9	6.5	7.4	8.0	9.5	10.9	12.1	11.9	9.8	5.3	1.5	-0.3	-0.6	-0.5	-0.2	-0.1	8.1
	Uncertainty (dB)	2.1	1.8	1.2	1.7	1.2	1.2	1.1	1.2	0.9	1.0	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.2	2.3	2.3	2.2	2.4	3.0	3.7	0.9
	PWL (dBA)	61.2	65.4	70.1	73.8	76.8	79.5	81.7	84.2	91.8	86.9	87.2	89.5	90.3	88.8	90.4	90.7	92.6	93.2	94.0	93.6	92.0	87.2	[81.2]	[79.1]	[78.1]	[78]	[76.5]	[73]	102.9
8.0	Turbine ON (dBA)	7.7	12.3	17.1	20.8	24.1	27.1	29.5	31.8	38.7	34.9	35.3	37.7	38.6	37.6	39.1	39.4	40.9	41.3	42.0	41.4	39.7	36.4	32.6	30.9	30.1	29.9	28.3	24.8	51.1
	Background (dBA)	-1.6	3.8	8.3	12.1	16.1	21.0	24.9	26.5	27.1	27.5	28.0	29.7	30.7	30.6	31.2	30.5	30.5	29.6	29.5	29.2	29.4	30.2	29.6	29.2	28.6	28.6	26.8	23.2	42.5
	Turbine ON - background adj (dBA)	7.2	11.7	16.5	20.1	23.3	25.9	27.6	30.3	38.4	34.0	34.4	36.9	37.8	36.6	38.3	38.8	40.5	40.9	41.7	41.1	39.3	35.2	29.6	[27.9]	[27.1]	[26.9]	[25.3]	[21.8]	50.4
	Signal to noise (dB)	9.3	8.5	8.8	8.7	8.0	6.1	4.6	5.3	11.6	7.4	7.3	8.0	7.9	6.9	7.9	8.9	10.4	11.6	12.5	12.2	10.3	6.2	3.0	1.6	1.5	1.4	1.5	1.6	8.5
	Uncertainty (dB)	2.2	1.9	1.2	1.7	1.3	1.3	1.3	1.2	0.9	1.0	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.1	2.5	2.3	2.2	2.3	2.9	3.7	0.9
	PWL (dBA)	60.3	64.8	69.6	73.2	76.4	79.0	80.7	83.4	91.5	87.1	87.5	90.0	90.9	89.7	91.4	91.9	93.6	94.0	94.8	94.2	92.4	88.3	82.7	[81]	[80.2]	[80]	[78.4]	[74.9]	103.5
9.0	Turbine ON (dBA)	8.0	12.6	17.3	21.1	24.3	26.9	29.5	32.0	38.4	35.3	35.5	37.7	38.7	37.9	39.3	39.8	41.1	41.5	42.2	41.6	39.8	37.2	34.4	33.1	32.4	32.3	30.5	26.7	51.4
	Background (dBA)	-0.4	4.9	9.0	12.7	16.9	23.3	24.8	26.2	27.9	28.5	29.1	31.1	31.9	31.8	32.2	31.9	32.0	31.2	30.8	30.6	31.3	32.0	31.2	30.7	30.2	30.1	28.4	24.5	43.9
	Turbine ON - background adj (dBA)	7.4	11.8	16.6	20.4	23.4	24.4	27.7	30.6	38.0	34.2	34.3	36.7	37.7	36.7	38.4	39.0	40.5	41.1	41.9	41.3	39.2	35.6	31.5	[30.1]	[29.4]	[29.3]	[27.5]	[23.7]	50.6
	Signal to noise (dB)	8.5	7.7	8.2	8.4	7.4	3.6	4.7	5.8	10.5	6.7	6.4	6.7	6.8	6.1	7.2	7.9	9.1	10.4	11.4	11.0	8.5	5.2	3.1	2.3	2.2	2.2	2.1	2.2	7.5
	Uncertainty (dB)	2.1	1.9	1.2	1.6	1.2	2.7	1.3	1.1	0.8	1.0	0.9	0.9	0.9	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.5	3.2	2.8	2.7	2.8	3.3	4.0	0.9
	PWL (dBA)	60.5	64.9	69.7	73.5	76.5	77.5	80.8	83.7	91.1	87.3	87.4	89.8	90.8	89.8	91.5	92.1	93.6	94.2	95.0	94.4	92.3	88.7	84.6	[83.2]	[82.5]	[82.4]	[80.6]	[76.8]	103.7

Table C.03 Type B measurement uncertainty summary

Overall Equipment Uncertainties		
	Typical values	Used values
Calibration	0.2 dB	0.2 dB
Board	0.3 dB	0.3 dB
Distance	0.1 dB	0.1 dB
Air absorption	0 dB	0 dB
Weather	0.5 dB	0.5 dB

1/3 Octave Band Uncertainties		
Frequency (Hz)	Microphone Uncertainty	Overall (including overall equipment Uncertainties)
20	0.8 dB	2 dB
25	0.8 dB	1.6 dB
31.5	0.5 dB	1.1 dB
40	0.5 dB	1.5 dB
50	0.5 dB	1.1 dB
63	0.5 dB	0.9 dB
80	0.5 dB	0.8 dB
100	0.5 dB	0.8 dB
125	0.5 dB	0.8 dB
160	0.5 dB	0.8 dB
200	0.3 dB	0.7 dB
250	0.3 dB	0.7 dB
315	0.3 dB	0.7 dB
400	0.3 dB	0.7 dB
500	0.3 dB	0.7 dB
630	0.3 dB	0.7 dB
800	0.3 dB	0.7 dB
1000	0.3 dB	0.8 dB
1250	0.3 dB	0.8 dB
1600	0.3 dB	0.8 dB
2000	0.3 dB	0.7 dB
2500	0.5 dB	0.8 dB
3150	0.5 dB	1.1 dB
4000	0.5 dB	1.1 dB
5000	0.5 dB	1 dB
6300	0.5 dB	1.1 dB
8000	0.5 dB	1.4 dB
10000	1.3 dB	1.7 dB

Table C.04 Detailed measurement uncertainty at hub height

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-29

Wind Bin (m/s)	Parameter	Average Wind Speed (m/s)	# of data points	Parameter	1/3 Octave Band (Hz)																													Overall
					20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
8.0	Turbine ON	8.02	11	Average (dBA)	8.4	12.7	17.5	21.3	24.3	27.0	29.3	31.4	35.0	33.7	33.7	35.8	36.6	35.4	36.7	37.1	38.7	39.0	39.8	39.1	37.3	33.8	29.3	26.9	26.0	26.0	24.4	20.9	48.8
				Uncertainty A (dB)	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.3	0.3	0.5	0.7	0.7	0.7	0.6		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7	
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.6	1.1	1.0	0.9	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.1	1.2	1.2	1.3	1.5	1.8		
	Background	8.01	107	Average (dBA)	-3.3	2.6	6.8	10.8	14.7	19.5	22.9	24.7	28.8	25.4	25.8	27.3	27.9	27.9	28.4	28.2	28.5	27.8	27.1	26.6	27.3	27.8	27.4	27.2	26.4	26.4	24.6	21.0	40.4
				Uncertainty A (dB)	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.9	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.8	0.9	1.1	1.1	1.1	1.1	1.4	1.7		
8.5	Turbine ON	8.52	13	Average (dBA)	8.9	13.2	17.8	21.3	24.8	27.5	29.5	31.8	36.7	34.0	34.1	36.2	37.0	35.8	37.1	37.5	39.1	39.5	40.3	39.6	38.1	34.5	29.7	27.1	26.1	26.1	24.5	21.1	49.3
				Uncertainty A (dB)	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.4	0.7	0.8	0.8	0.8	0.8		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7	
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.6	1.1	1.0	0.9	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.1	1.3	1.3	1.3	1.6	1.9		
	Background	8.50	118	Average (dBA)	-2.9	2.8	7.3	11.2	15.4	19.1	22.9	29.6	26.8	26.7	26.3	27.7	28.5	28.5	29.0	28.7	28.7	28.0	27.0	26.5	27.2	27.8	27.4	27.2	26.5	26.4	24.6	21.0	40.8
				Uncertainty A (dB)	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.7	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.9	1.1	0.9	0.9	0.7	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.9	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.4	1.7		
9.0	Turbine ON	8.95	19	Average (dBA)	9.4	13.7	18.0	21.7	25.0	27.7	30.2	32.5	37.6	34.9	34.6	36.5	37.4	36.1	37.5	37.8	39.3	39.7	40.4	39.8	38.3	34.9	30.6	28.3	27.2	27.2	25.7	22.3	49.7
				Uncertainty A (dB)	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.5	0.6	0.7	0.6	0.6		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.6	1.1	1.0	0.9	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.1	1.2	1.2	1.3	1.5	1.8		
	Background	9.02	157	Average (dBA)	-2.7	3.1	7.8	11.5	15.6	20.9	23.5	28.5	26.5	26.5	26.7	28.3	29.1	29.2	29.8	29.4	29.6	28.8	28.2	27.9	28.6	29.0	28.6	28.2	27.6	27.5	25.6	22.0	41.5
				Uncertainty A (dB)	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.9	1.0	0.9	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.1	1.1	1.0	1.1	1.4	1.7		
9.5	Turbine ON	9.50	40	Average (dBA)	8.7	13.0	17.4	21.1	24.4	27.2	29.8	31.7	38.2	34.3	34.5	36.6	37.4	36.2	37.6	37.9	39.5	39.9	40.7	40.2	39.1	35.2	30.4	27.9	26.8	26.8	25.2	21.8	49.9
				Uncertainty A (dB)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.4	0.5	0.5	0.5	0.5		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.1	1.2	1.4	1.8		
	Background	9.51	129	Average (dBA)	-2.6	3.1	7.9	11.7	16.0	19.5	22.7	25.8	26.4	26.9	26.7	28.4	29.5	29.8	30.4	30.0	29.9	29.0	28.6	28.4	29.4	30.1	29.3	28.7	27.8	27.7	25.9	22.2	41.8
				Uncertainty A (dB)	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.9	0.9	0.9	0.9	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.8	0.9	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.4	1.7		
10.0	Turbine ON	9.98	29	Average (dBA)	8.3	12.7	17.3	20.8	24.1	27.2	29.6	31.9	39.6	34.5	34.8	37.0	37.7	36.6	38.0	38.2	39.8	40.3	41.0	40.6	39.3	35.5	30.9	28.5	27.6	27.5	26.0	22.5	50.3
				Uncertainty A (dB)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.5		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.6	1.1	1.0	0.9	0.9	1.0	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.1	1.2	1.4	1.8		
	Background	9.98	108	Average (dBA)	-1.7	3.6	8.3	12.1	15.9	19.7	23.4	27.9	26.5	26.8	27.5	29.0	30.2	30.4	30.9	30.5	30.5	29.8	29.2	29.1	29.8	30.5	29.9	29.6	28.9	28.8	27.0	23.3	42.5
				Uncertainty A (dB)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.9	1.0	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.4	1.7		

Table C.04 Detailed measurement uncertainty at hub height

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-29

Wind Bin (m/s)	Parameter	Average Wind Speed (m/s)	# of data points	Parameter	1/3 Octave Band (Hz)																													Overall
					20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
10.5	Turbine ON	10.49	23	Average (dBA)	8.8	13.1	17.6	21.6	24.6	27.5	29.9	31.9	38.2	34.7	35.0	37.2	38.0	36.8	38.2	38.4	40.1	40.5	41.2	40.8	39.4	35.7	31.1	29.1	27.9	27.8	26.3	22.9	50.4
				Uncertainty A (dB)	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.6	0.7	0.7	0.7	0.6		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7	
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.6	1.1	1.0	0.9	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.1	1.2	1.2	1.3	1.5	1.8		
	Background	10.48	98	Average (dBA)	-1.7	3.5	8.2	12.0	16.0	20.2	23.4	24.9	26.7	27.5	27.6	29.2	30.1	30.3	30.8	30.5	30.7	29.5	29.2	28.9	29.6	30.3	29.6	29.2	28.5	28.4	26.6	23.0	42.3
				Uncertainty A (dB)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.9	0.9	0.8	0.9	0.7	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.9	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.4	1.7		
11.0	Turbine ON	10.99	20	Average (dBA)	8.9	12.9	17.9	21.6	24.8	27.7	30.2	34.0	39.1	34.9	35.1	37.4	38.2	37.0	38.4	38.6	40.2	40.6	41.4	40.9	39.3	35.7	31.5	29.5	28.7	28.7	27.2	23.6	50.6
				Uncertainty A (dB)	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.7	0.6	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.4	0.5	0.5	0.4	0.4		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7	
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.6	1.1	1.0	0.9	1.1	1.0	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	1.1	1.1	1.1	1.2	1.4	1.7		
	Background	11.00	46	Average (dBA)	-2.0	3.4	8.3	12.3	16.4	21.6	25.4	24.4	27.0	26.6	27.4	29.2	29.9	29.9	30.4	30.0	30.2	29.2	28.5	28.1	28.6	29.3	28.9	28.6	27.9	27.9	26.1	22.4	41.9
				Uncertainty A (dB)	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	1.0	0.9	0.9	0.9	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.2	1.2	1.1	1.2	1.4	1.8		
11.5	Turbine ON	11.54	64	Average (dBA)	7.7	12.3	17.1	20.6	24.0	27.4	29.4	31.7	38.4	34.8	35.4	37.7	38.6	37.5	39.0	39.4	40.9	41.3	42.0	41.5	40.1	36.5	32.4	30.7	29.8	29.7	28.1	24.6	51.1
				Uncertainty A (dB)	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	1.1	1.1	1.1	1.1	1.4	1.7		
	Background	11.53	37	Average (dBA)	-1.3	4.0	8.4	12.1	16.1	21.6	24.5	26.4	27.1	27.3	28.0	29.8	30.9	30.9	31.3	31.0	31.0	30.2	29.6	29.4	30.0	30.9	30.2	29.9	29.2	29.2	27.4	23.7	42.9
				Uncertainty A (dB)	0.3	0.3	0.2	0.2	0.2	0.5	0.6	0.6	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.1	1.0	1.0	0.9	0.9	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.2	1.2	1.5	1.8		
12.0	Turbine ON	11.99	64	Average (dBA)	7.7	12.3	17.1	20.9	24.1	26.9	29.5	31.9	38.6	34.9	35.3	37.7	38.6	37.6	39.1	39.5	40.9	41.2	41.9	41.3	39.6	36.4	32.7	31.0	30.3	30.2	28.6	25.0	51.0
				Uncertainty A (dB)	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.4	0.4	0.4		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.8	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.1	1.1	1.4	1.7		
	Background	11.93	16	Average (dBA)	-1.8	3.9	8.2	12.1	16.5	20.8	26.1	28.4	27.7	28.3	28.9	29.8	30.8	30.8	31.8	29.9	29.6	28.9	30.4	29.7	28.7	29.4	28.6	28.1	27.5	27.5	25.9	22.3	42.5
				Uncertainty A (dB)	0.4	0.4	0.4	0.3	0.5	0.5	1.2	1.2	0.5	0.7	0.7	0.4	0.5	0.6	0.8	0.5	0.6	0.5	1.0	1.0	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.6	1.2	1.1	1.4	1.4	0.9	1.1	1.0	0.8	0.8	0.9	1.1	0.9	0.9	0.9	1.3	1.2	1.0	1.1	1.3	1.3	1.2	1.3	1.5	1.8		
12.5	Turbine ON	12.49	56	Average (dBA)	7.6	12.1	17.0	20.7	24.1	26.9	29.4	31.8	38.9	35.0	35.3	37.7	38.6	37.8	39.2	39.7	41.0	41.4	42.1	41.4	39.5	36.5	33.1	31.6	30.9	30.7	29.0	25.3	51.2
				Uncertainty A (dB)	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.4		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.5	1.1	1.0	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.1	1.1	1.4	1.7		
	Background	12.49	11	Average (dBA)	-1.2	3.8	8.3	12.6	16.1	20.1	23.1	25.0	27.1	27.2	27.5	29.7	30.9	30.8	31.5	31.1	30.9	30.2	29.5	29.5	30.2	30.8	30.2	29.9	29.2	29.2	27.4	23.6	42.8
				Uncertainty A (dB)	0.4	0.3	0.3	0.3	0.3	0.5	0.7	0.7	0.5	0.4	0.3	0.4	0.5	0.5	0.7	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7		
				Uncertainty B (dB)	2.0	1.6	1.1	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.8	1.1	1.1	1.0	1.1	1.4	1.7		
				Combined Uncertainty (dB)	2.0	1.7	1.1	1.6	1.1	1.1	1.1	1.1	1.0	0.9	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.4	1.4	1.3	1.4	1.6	1.9		

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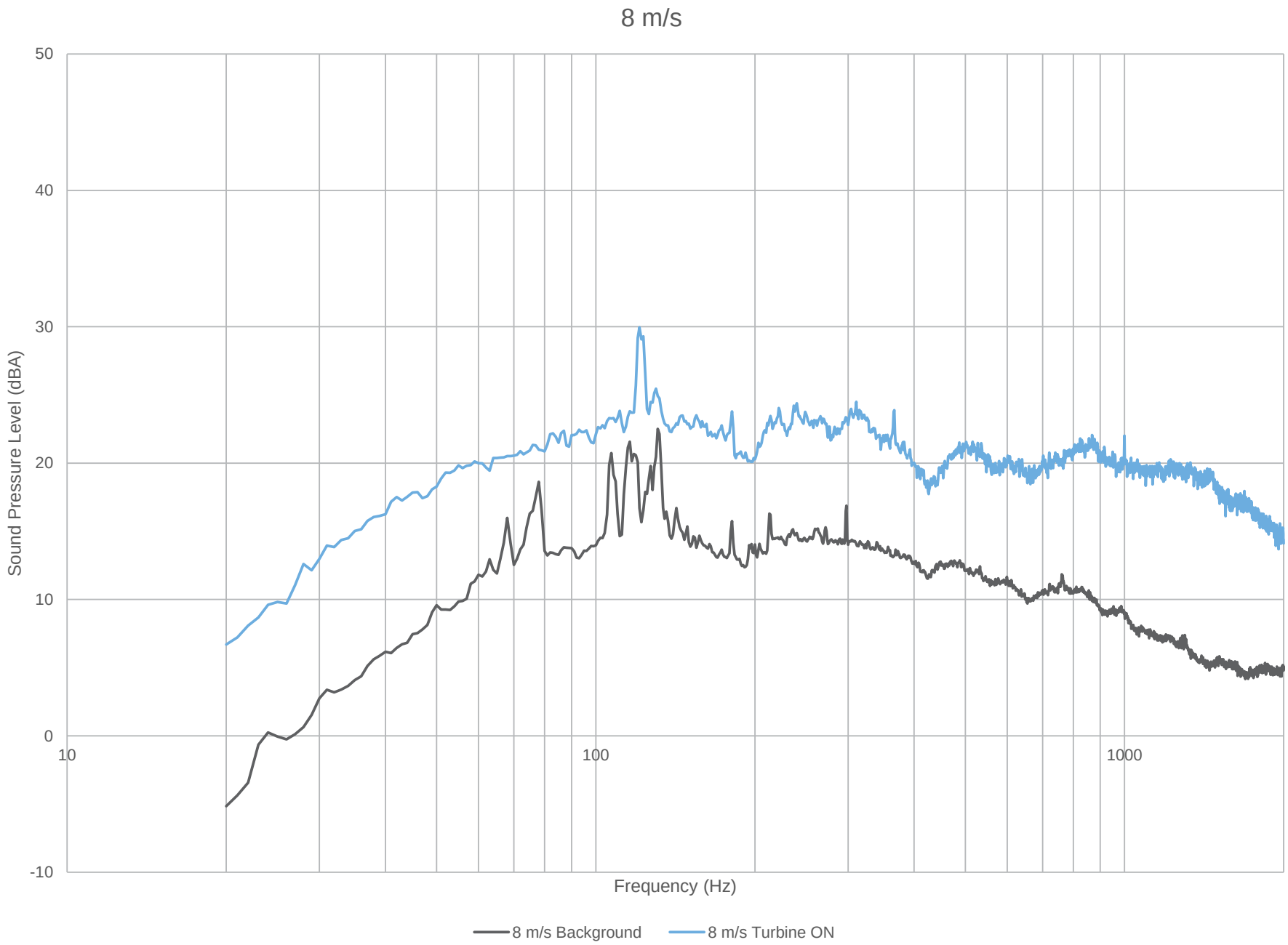
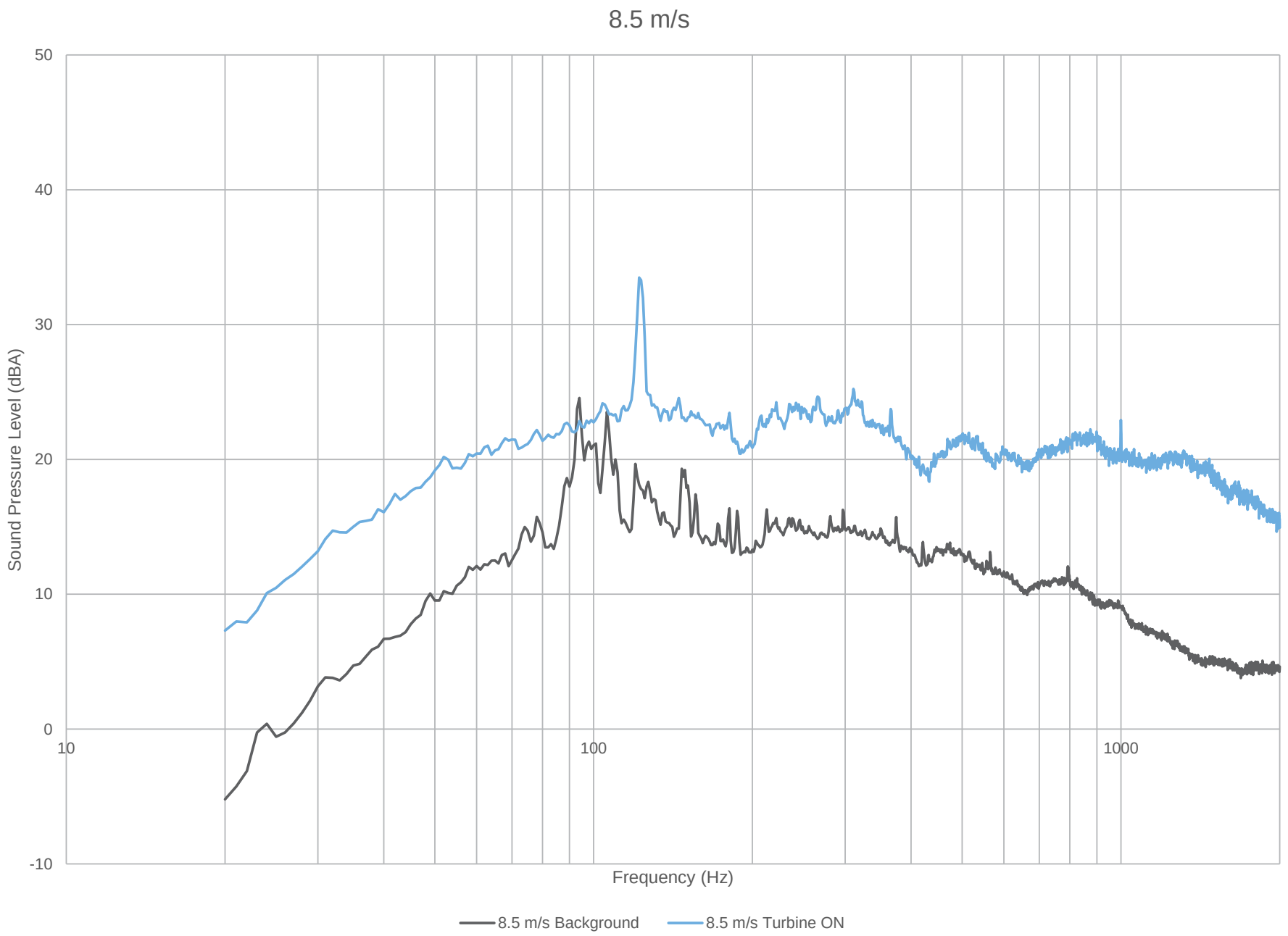
Appendix D
Tonality Assessment

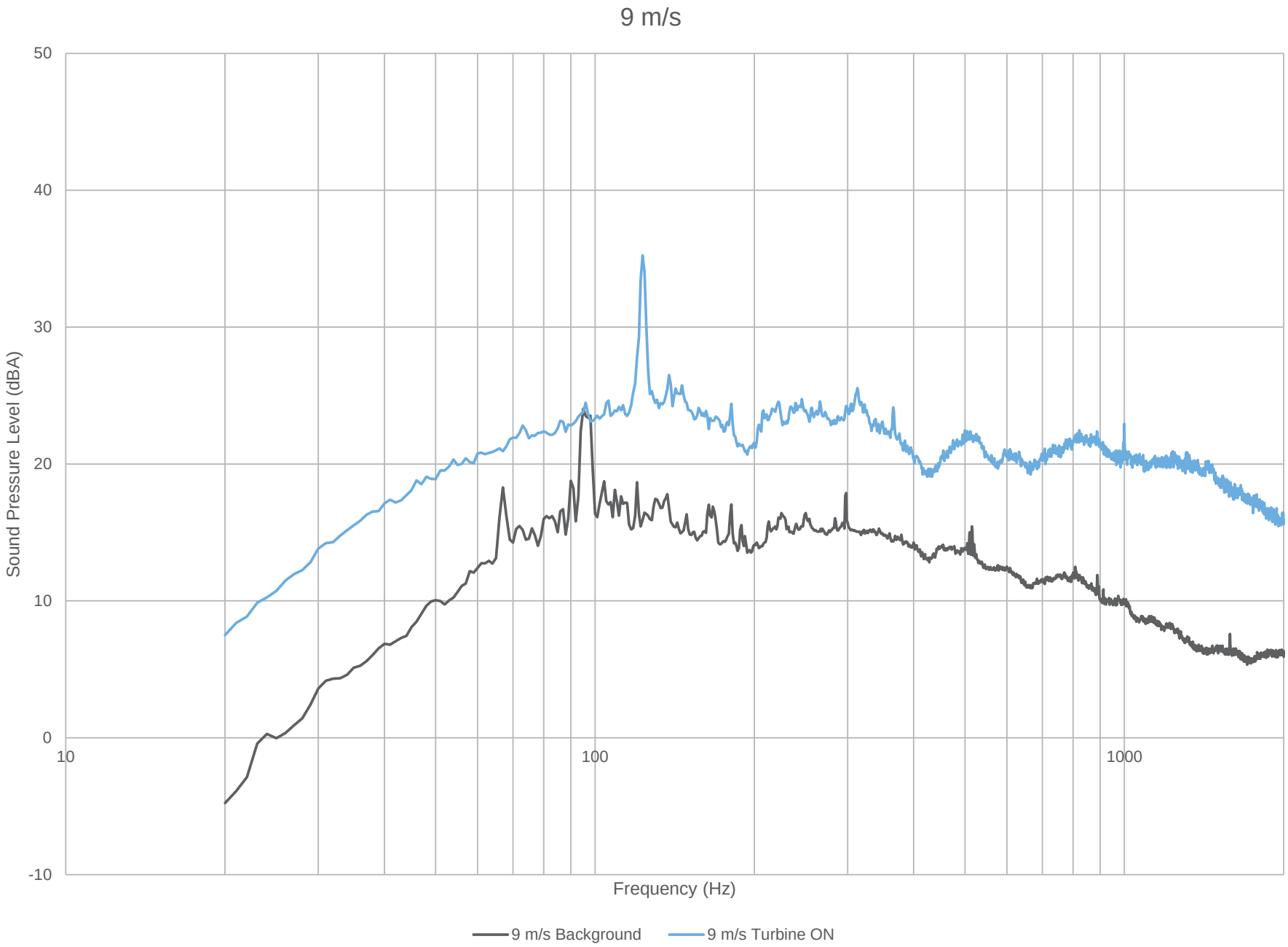


aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 8.0 m/s

Figure D.01

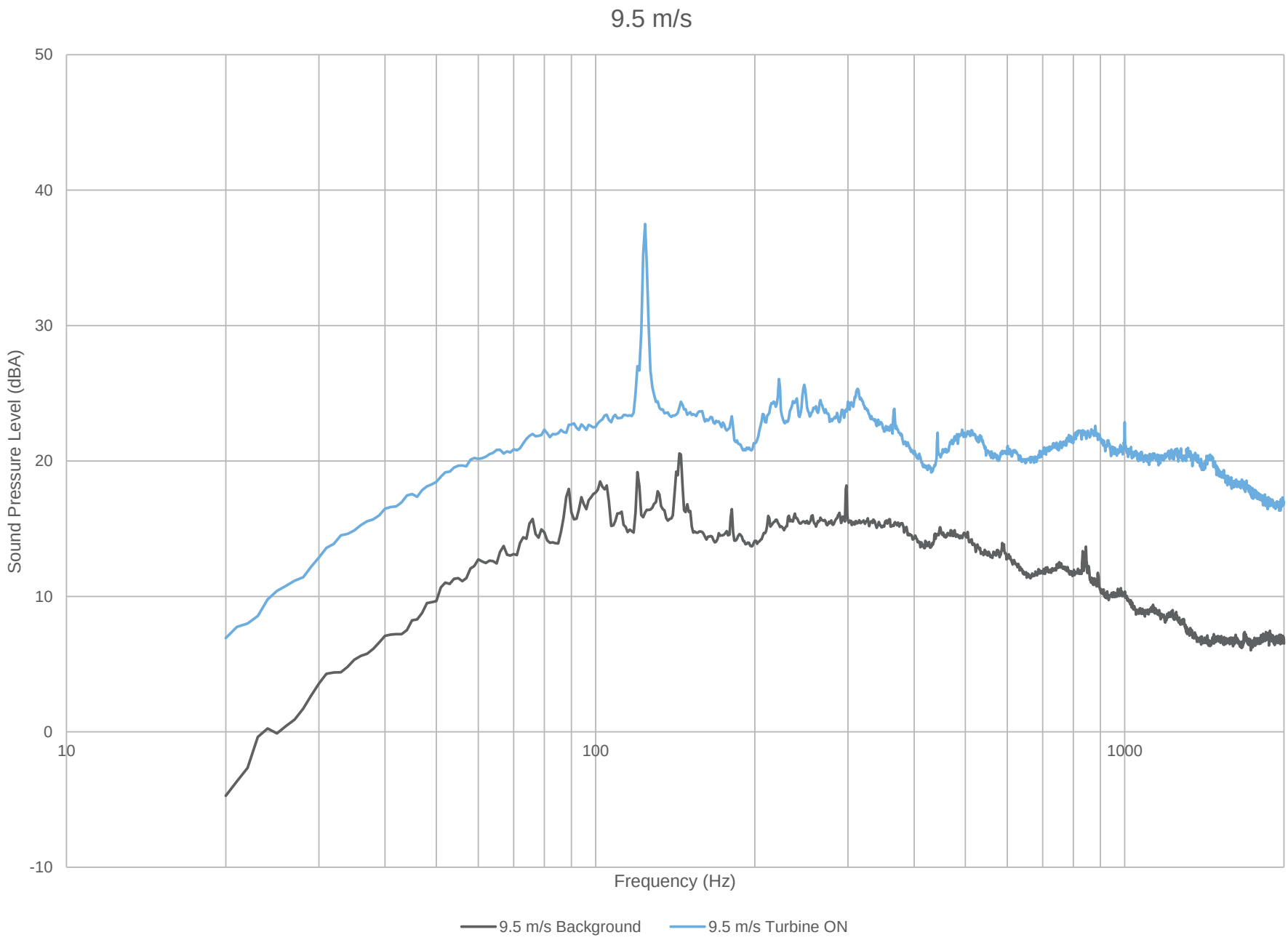


aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 8.5 m/s
		Figure D.02

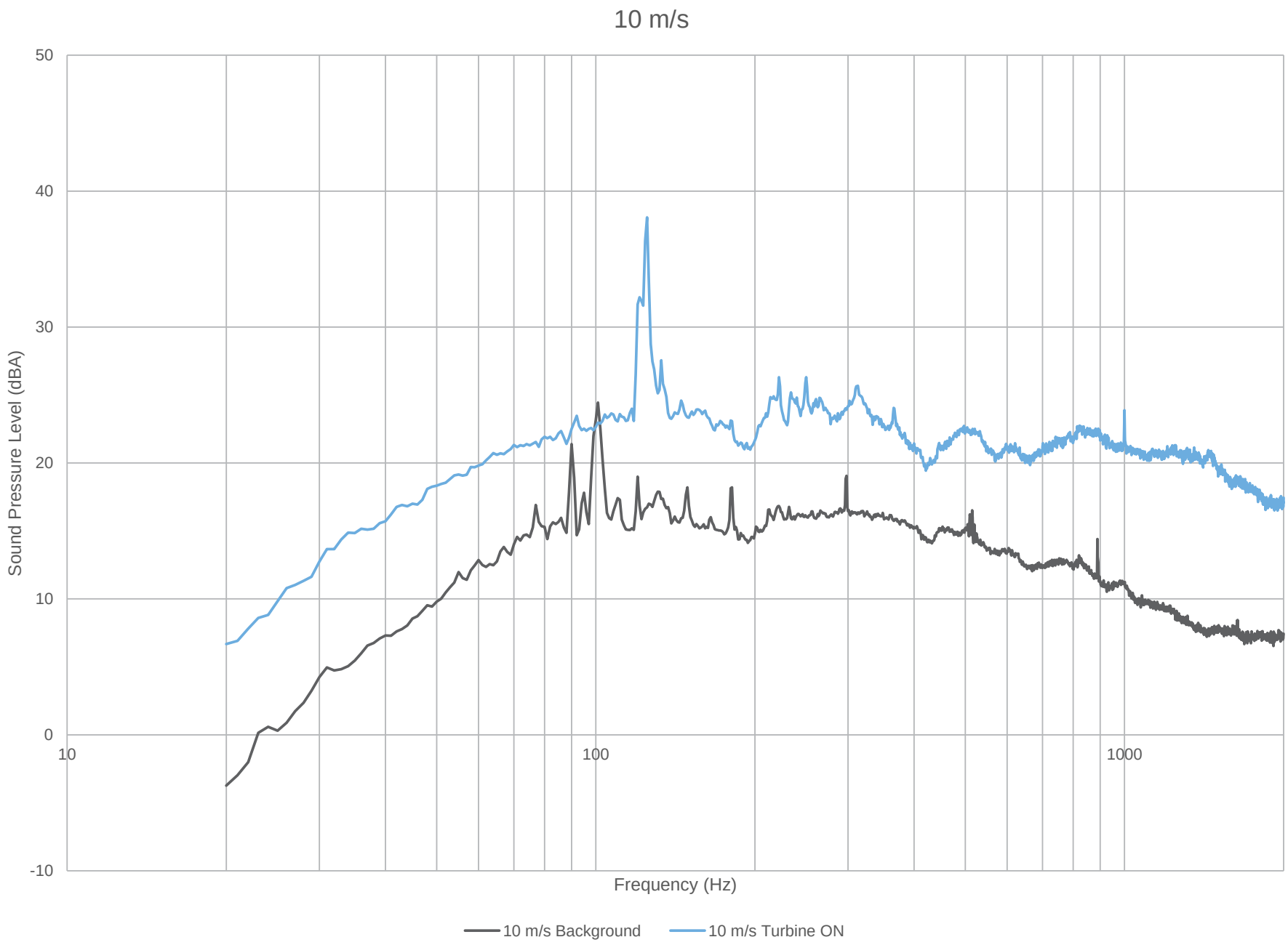


aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 9.0 m/s

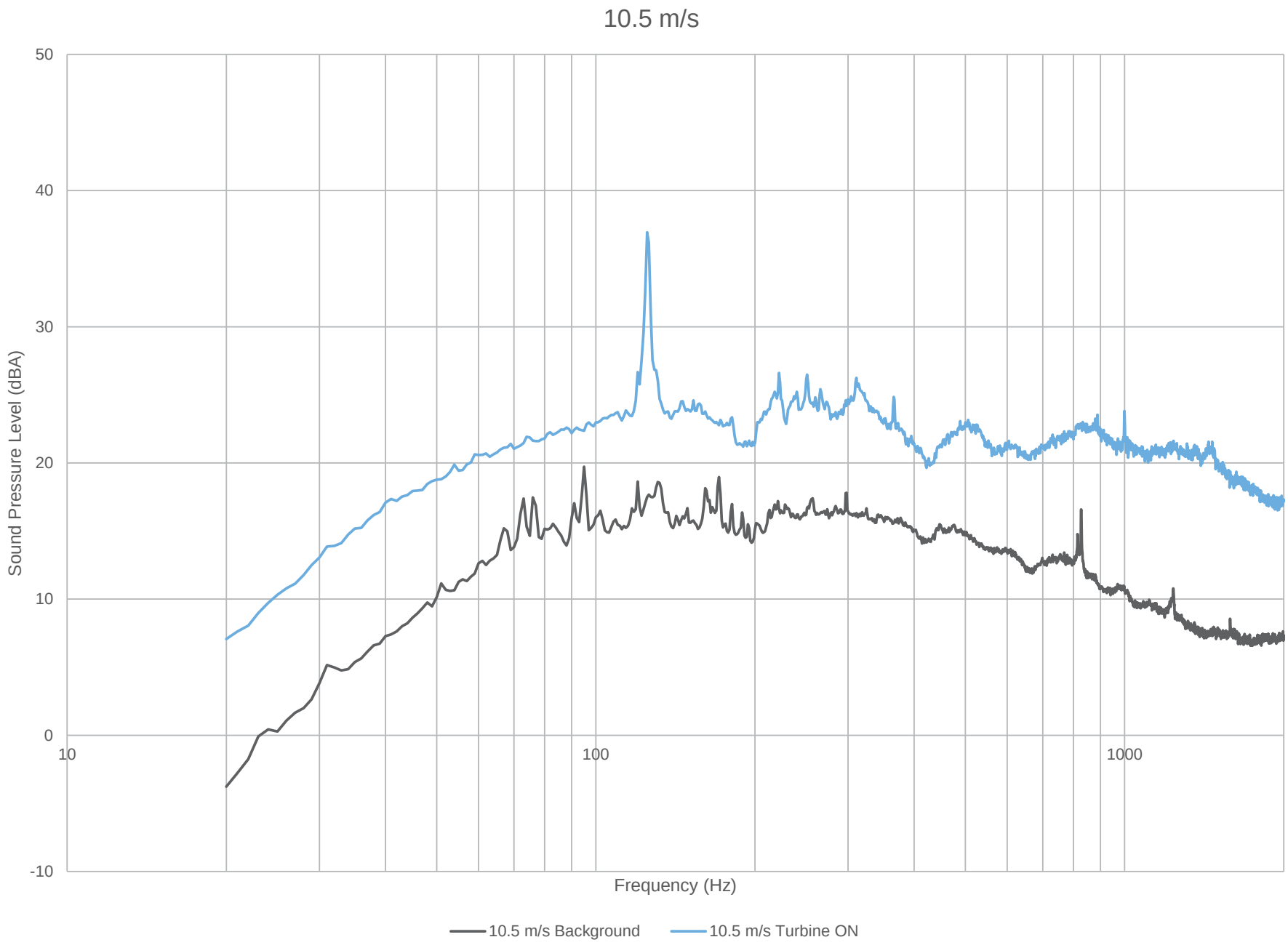
Figure D.03



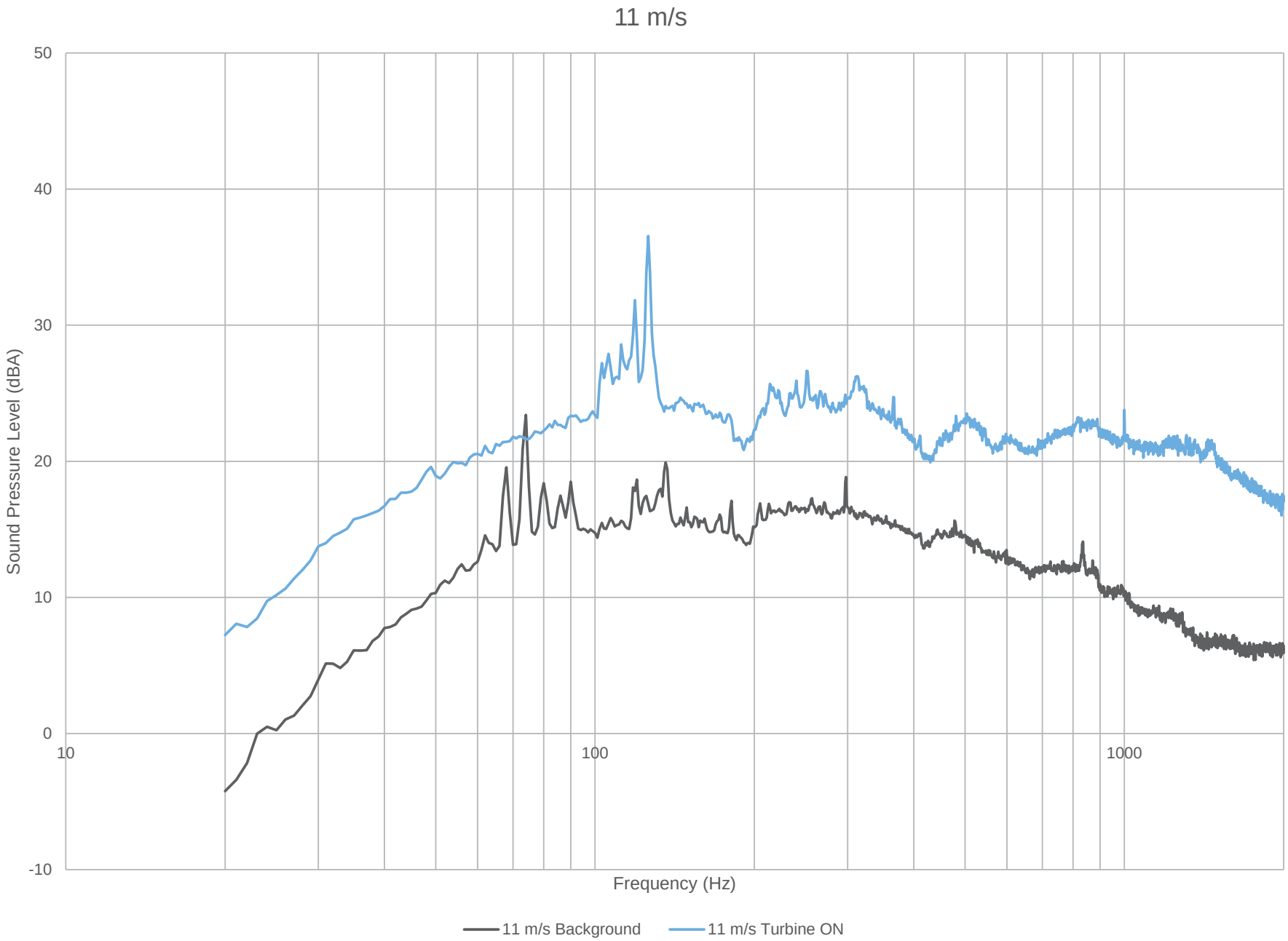
aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 9.5 m/s
		Figure D.04



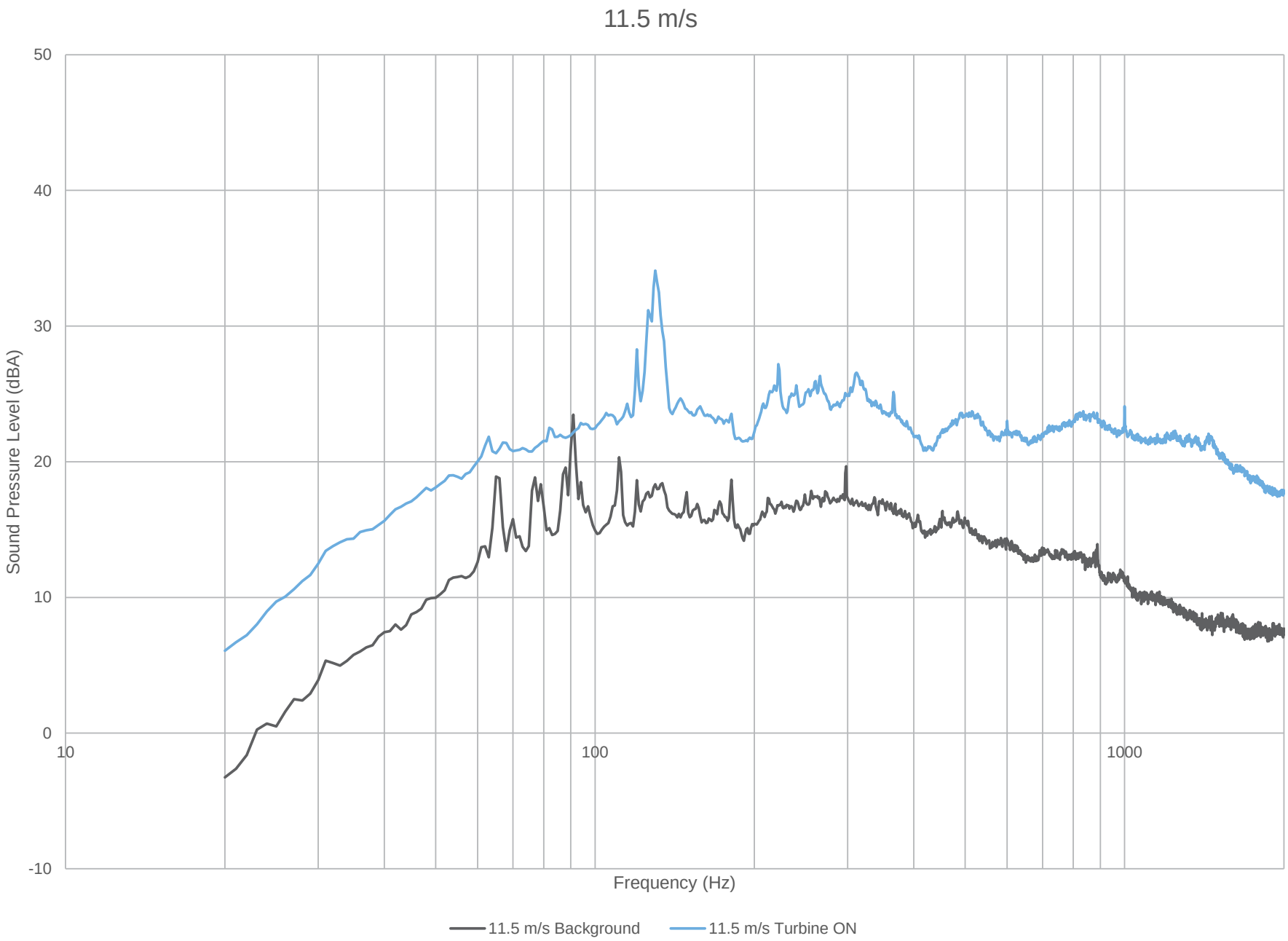
aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 10.0 m/s
		Figure D.05



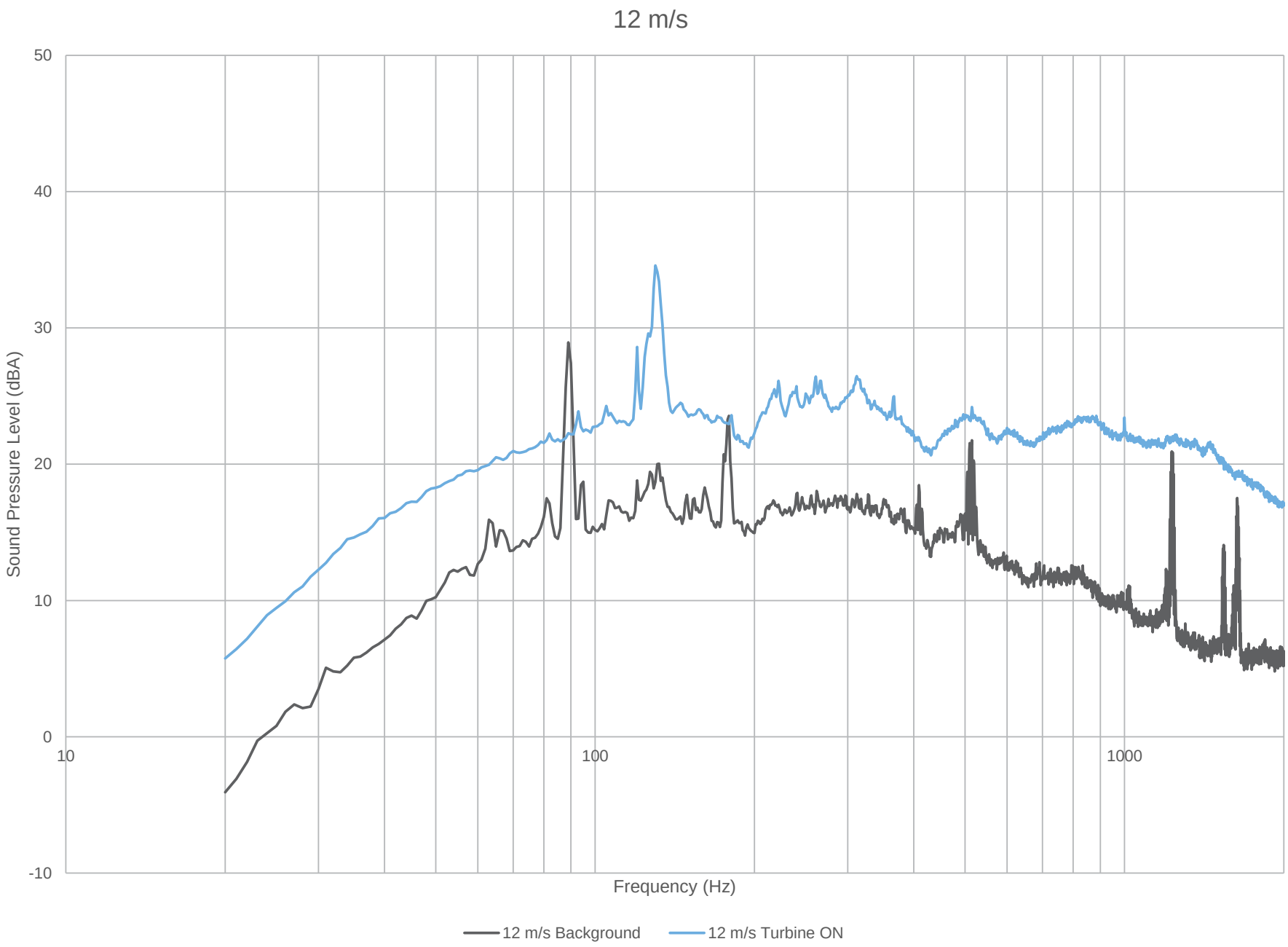
aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 10.5 m/s
		Figure D.06



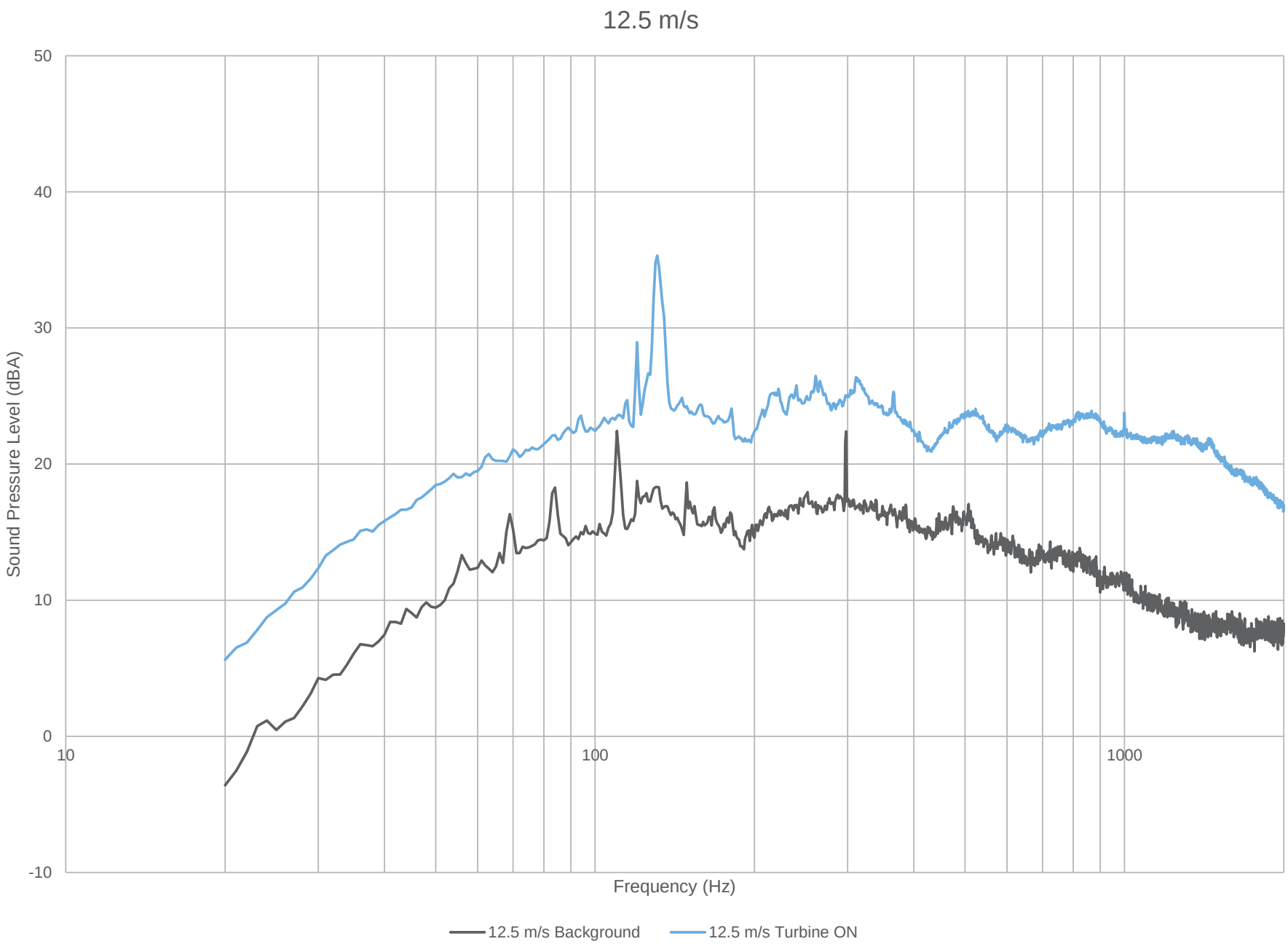
aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 11.0 m/s
		Figure D.07



aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 11.5 m/s
		Figure D.08



aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 12.0 m/s
		Figure D.09



aercoustics	16115.01.T12.RP3	**Project Name**
	Scale: NTS Drawn by: NT Reviewed by: DH Date: Apr 2022 Revision: 1	Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
		Figure Title Plot of narrow band spectra - Turbine ON vs. Background at 12.5 m/s
		Figure D.10

Table D.01 Tonality Assessment Table - 8 m/s

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-12

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
No Reportable Tones							

Table D.02 Tonality Assessment Table - 8.5 m/s

Created on: 2022-04-12

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
Report ID: 16115.01.T12.RP3

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
412	121	21.7	40.0	34.3	-5.7	-2.0	-3.7
67	121	24.1	42.4	35.9	-6.5	-2.0	-4.5
270	122	23.1	41.4	35.6	-5.8	-2.0	-3.8
68	122	24.0	42.3	39.6	-2.7	-2.0	-0.7
414	122	22.6	40.9	34.7	-6.2	-2.0	-4.1
235	122	21.5	39.8	36.5	-3.4	-2.0	-1.3
275	122	24.3	42.6	35.3	-7.3	-2.0	-5.3
234	122	22.2	40.5	34.1	-6.4	-2.0	-4.4
537	123	22.6	40.9	35.9	-5.0	-2.0	-3.0
413	123	22.5	40.8	33.7	-7.2	-2.0	-5.1
421	124	23.9	42.2	36.3	-5.8	-2.0	-3.8
186	124	23.9	42.2	41.4	-0.8	-2.0	1.2
273	124	23.5	41.8	36.6	-5.2	-2.0	-3.2
Average	122				-4.8	-2.0	-2.8

Table D.03 Tonality Assessment Table - 9 m/s

Created on: 2022-04-12

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
Report ID: 16115.01.T12.RP3

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
240	122	23.7	42.0	34.4	-7.6	-2.0	-5.6
404	122	23.0	41.2	36.3	-5.0	-2.0	-3.0
533	122	22.9	41.2	37.6	-3.6	-2.0	-1.6
236	122	21.6	39.9	37.2	-2.7	-2.0	-0.7
239	122	22.5	40.8	35.6	-5.2	-2.0	-3.2
73	123	23.2	41.5	41.4	-0.1	-2.0	1.9
534	123	23.5	41.8	37.1	-4.7	-2.0	-2.7
411	123	22.7	41.0	37.9	-3.1	-2.0	-1.1
238	123	22.6	40.9	38.4	-2.5	-2.0	-0.5
233	123	23.5	41.8	36.9	-4.9	-2.0	-2.9
58	123	24.1	42.4	40.8	-1.6	-2.0	0.5
532	123	23.4	41.7	36.1	-5.6	-2.0	-3.6
66	124	23.8	42.1	40.9	-1.2	-2.0	0.9
422	124	26.6	44.9	35.0	-9.8	-2.0	-7.8
229	124	22.6	40.9	37.0	-3.9	-2.0	-1.9
69	124	22.9	41.2	40.6	-0.6	-2.0	1.4
423	124	24.7	43.0	32.3	-10.8	-2.0	-8.7
407	125	22.6	40.9	36.1	-4.7	-2.0	-2.7
199	138	27.9	46.2	39.1	-7.0	-2.0	-5.0
Average	124				-3.7	-2.0	-1.6

Table D.04 Tonality Assessment Table - 9.5 m/s

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Created on: 2022-04-12

Report ID: 16115.01.T12.RP3

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
402	123	23.7	42.0	37.4	-4.6	-2.0	-2.6
181	123	23.6	41.9	40.7	-1.2	-2.0	0.8
60	123	24.3	42.6	35.5	-7.2	-2.0	-5.1
61	123	24.4	42.7	40.7	-1.9	-2.0	0.1
531	124	23.8	42.1	38.5	-3.6	-2.0	-1.6
230	124	22.7	41.0	39.4	-1.5	-2.0	0.5
410	124	23.5	41.8	36.2	-5.5	-2.0	-3.5
536	124	22.1	40.4	37.1	-3.4	-2.0	-1.3
182	124	22.5	40.8	39.8	-1.0	-2.0	1.1
62	124	23.6	41.9	38.0	-3.9	-2.0	-1.9
232	124	23.2	41.4	37.5	-3.9	-2.0	-1.9
231	124	22.6	40.8	38.9	-1.9	-2.0	0.1
75	124	23.0	41.3	40.4	-0.9	-2.0	1.1
65	124	24.2	42.5	42.0	-0.5	-2.0	1.5
195	124	22.4	40.7	39.5	-1.2	-2.0	0.8
70	124	22.5	40.7	41.7	0.9	-2.0	2.9
64	124	24.3	42.5	39.4	-3.1	-2.0	-1.1
198	124	22.0	40.3	40.7	0.4	-2.0	2.4
529	124	23.3	41.6	38.9	-2.7	-2.0	-0.7
316	124	23.1	41.4	38.8	-2.5	-2.0	-0.5
409	124	23.0	41.3	37.5	-3.8	-2.0	-1.8
59	124	24.5	42.8	40.8	-1.9	-2.0	0.1
180	124	23.7	41.9	38.9	-3.0	-2.0	-1.0
274	124	25.3	43.6	34.6	-9.0	-2.0	-7.0
237	124	21.2	39.5	39.1	-0.4	-2.0	1.6
72	124	23.1	41.3	39.7	-1.6	-2.0	0.4
74	124	23.0	41.3	40.8	-0.5	-2.0	1.5
403	124	22.9	41.1	38.3	-2.9	-2.0	-0.9
183	124	23.0	41.3	38.6	-2.7	-2.0	-0.7
97	124	24.2	42.4	40.1	-2.4	-2.0	-0.4
269	124	22.9	41.2	38.9	-2.3	-2.0	-0.2
535	124	23.3	41.6	36.5	-5.2	-2.0	-3.1
194	124	22.6	40.9	41.3	0.3	-2.0	2.3
408	124	21.8	40.1	37.5	-2.6	-2.0	-0.6
528	124	24.0	42.2	37.9	-4.4	-2.0	-2.4
188	124	22.0	40.3	41.1	0.8	-2.0	2.8
57	124	24.3	42.5	37.8	-4.8	-2.0	-2.7
530	124	23.1	41.4	38.4	-3.0	-2.0	-0.9
187	125	23.4	41.7	42.4	0.7	-2.0	2.7
241	126	23.8	42.1	37.8	-4.3	-2.0	-2.2
Average	124				-2.1	-2.0	-0.1

Table D.05 Tonality Assessment Table - 10 m/s

Created on: 2022-04-12

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
Report ID: 16115.01.T12.RP3

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
200	121	26.6	44.8	50.8	6.0	-2.0	8.0
401	124	23.3	41.6	37.1	-4.4	-2.0	-2.4
71	124	23.5	41.7	40.9	-0.8	-2.0	1.2
309	124	24.2	42.4	39.5	-3.0	-2.0	-1.0
193	124	22.8	41.1	38.0	-3.2	-2.0	-1.1
276	125	24.7	43.0	38.2	-4.8	-2.0	-2.8
190	125	20.7	39.0	42.2	3.2	-2.0	5.2
196	125	21.3	39.6	39.1	-0.5	-2.0	1.5
317	125	24.6	42.9	38.4	-4.5	-2.0	-2.5
159	125	23.6	41.8	37.5	-4.3	-2.0	-2.3
179	125	24.4	42.7	37.1	-5.5	-2.0	-3.5
77	125	24.0	42.3	43.2	1.0	-2.0	3.0
197	125	21.9	40.2	39.8	-0.3	-2.0	1.7
95	125	23.2	41.5	34.7	-6.7	-2.0	-4.7
523	125	23.7	41.9	35.7	-6.2	-2.0	-4.2
56	125	23.6	41.9	37.3	-4.7	-2.0	-2.6
141	125	23.3	41.5	40.5	-1.1	-2.0	0.9
191	125	21.7	40.0	43.8	3.8	-2.0	5.9
158	125	22.6	40.9	39.9	-1.0	-2.0	1.0
268	125	22.5	40.8	33.5	-7.3	-2.0	-5.3
189	125	21.4	39.7	41.3	1.7	-2.0	3.7
526	125	22.6	40.9	37.5	-3.3	-2.0	-1.3
525	125	23.8	42.1	36.7	-5.4	-2.0	-3.4
524	125	23.2	41.5	34.9	-6.6	-2.0	-4.5
527	125	23.0	41.2	36.7	-4.5	-2.0	-2.5
87	125	22.0	40.3	41.0	0.7	-2.0	2.7
76	125	23.8	42.0	42.5	0.4	-2.0	2.4
160	125	24.2	42.5	38.8	-3.7	-2.0	-1.7
400	125	23.0	41.2	33.6	-7.7	-2.0	-5.7
Average	125				-0.9	-2.0	1.1

Table D.06 Tonality Assessment Table - 10.5 m/s

Created on: 2022-04-12

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
Report ID: 16115.01.T12.RP3

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
94	123	23.7	42.0	35.9	-6.1	-2.0	-4.1
308	123	24.5	42.8	40.6	-2.3	-2.0	-0.2
112	125	23.4	41.7	41.2	-0.5	-2.0	1.5
88	125	22.4	40.7	36.3	-4.4	-2.0	-2.4
96	125	23.7	42.0	39.3	-2.7	-2.0	-0.7
118	125	23.7	42.0	39.6	-2.4	-2.0	-0.4
522	125	23.4	41.7	34.3	-7.4	-2.0	-5.4
86	125	21.4	39.7	38.6	-1.1	-2.0	0.9
131	125	23.1	41.3	38.5	-2.9	-2.0	-0.8
277	125	24.3	42.6	41.6	-1.0	-2.0	1.1
55	125	24.2	42.5	40.4	-2.1	-2.0	-0.1
63	125	22.7	41.0	41.3	0.3	-2.0	2.3
78	125	23.2	41.5	40.9	-0.6	-2.0	1.4
398	126	22.0	40.3	35.6	-4.7	-2.0	-2.7
220	126	22.8	41.1	38.0	-3.2	-2.0	-1.2
315	126	23.7	42.0	38.5	-3.5	-2.0	-1.5
157	126	22.6	40.9	41.5	0.6	-2.0	2.6
54	126	24.2	42.5	39.6	-2.9	-2.0	-0.9
431	126	25.0	43.3	36.2	-7.2	-2.0	-5.1
192	126	22.2	40.5	39.5	-1.0	-2.0	1.0
132	126	23.4	41.7	38.1	-3.6	-2.0	-1.6
215	126	24.8	43.1	39.7	-3.3	-2.0	-1.3
425	127	25.3	43.6	37.5	-6.1	-2.0	-4.1
Average	125				-2.5	-2.0	-0.4

Table D.07 Tonality Assessment Table - 11 m/s

Created on: 2022-04-12

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
Report ID: 16115.01.T12.RP3

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
201	119	26.0	44.2	49.9	5.7	-2.0	7.7
347	126	23.9	42.2	34.9	-7.3	-2.0	-5.3
397	126	22.6	40.9	38.9	-2.0	-2.0	0.1
521	126	23.3	41.6	34.9	-6.7	-2.0	-4.7
178	126	24.4	42.7	36.9	-5.8	-2.0	-3.8
267	126	22.5	40.8	35.0	-5.8	-2.0	-3.7
161	126	22.9	41.2	38.7	-2.6	-2.0	-0.5
142	126	24.5	42.7	40.8	-2.0	-2.0	0.0
83	126	23.5	41.8	41.4	-0.4	-2.0	1.6
348	126	23.2	41.5	36.9	-4.6	-2.0	-2.6
165	126	24.9	43.1	38.3	-4.9	-2.0	-2.8
310	126	24.4	42.7	36.8	-5.9	-2.0	-3.9
120	126	24.5	42.8	41.0	-1.8	-2.0	0.2
399	126	22.0	40.3	34.9	-5.4	-2.0	-3.4
156	126	22.7	41.0	37.0	-4.0	-2.0	-2.0
79	126	23.4	41.7	39.5	-2.2	-2.0	-0.2
80	126	24.6	42.9	33.1	-9.8	-2.0	-7.8
279	126	24.5	42.8	41.0	-1.8	-2.0	0.2
314	127	24.1	42.4	38.6	-3.9	-2.0	-1.8
Average	126				-2.2	-2.0	-0.2

Table D.08 Tonality Assessment Table - 11.5 m/s

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Created on: 2022-04-12

Report ID: 16115.01.T12.RP3

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
514	124	23.0	41.3	40.5	-0.8	-2.0	1.2
358	126	22.8	41.1	38.4	-2.7	-2.0	-0.7
37	126	23.5	41.8	40.4	-1.4	-2.0	0.6
393	126	24.2	42.5	42.9	0.4	-2.0	2.4
162	126	22.5	40.8	39.1	-1.7	-2.0	0.3
43	126	23.2	41.5	40.2	-1.2	-2.0	0.8
13	126	22.2	40.5	38.4	-2.2	-2.0	-0.1
495	126	24.3	42.6	42.0	-0.6	-2.0	1.4
36	126	22.0	40.2	34.6	-5.7	-2.0	-3.6
111	127	23.1	41.4	36.1	-5.3	-2.0	-3.3
172	127	21.9	40.2	37.8	-2.4	-2.0	-0.4
85	127	23.2	41.5	38.6	-2.9	-2.0	-0.9
519	127	22.7	40.9	36.8	-4.2	-2.0	-2.2
81	127	22.9	41.1	37.3	-3.8	-2.0	-1.8
345	127	22.9	41.1	35.6	-5.5	-2.0	-3.5
290	127	23.2	41.5	37.2	-4.2	-2.0	-2.2
155	127	23.3	41.6	36.2	-5.4	-2.0	-3.4
176	128	22.8	41.1	40.9	-0.2	-2.0	1.8
137	129	23.6	41.9	41.0	-0.9	-2.0	1.1
261	129	21.1	39.4	39.3	-0.1	-2.0	1.9
166	129	23.9	42.2	42.0	-0.2	-2.0	1.8
154	129	23.4	41.7	36.8	-4.9	-2.0	-2.9
38	129	23.9	42.2	41.4	-0.8	-2.0	1.2
265	129	22.5	40.8	40.1	-0.7	-2.0	1.3
116	129	22.8	41.1	37.7	-3.4	-2.0	-1.4
123	129	25.3	43.6	34.3	-9.2	-2.0	-7.2
47	130	24.4	42.7	39.3	-3.4	-2.0	-1.4
102	130	24.8	43.1	41.6	-1.6	-2.0	0.5
280	130	23.7	42.0	39.8	-2.2	-2.0	-0.2
50	130	23.9	42.2	42.7	0.5	-2.0	2.5
42	130	23.1	41.3	40.3	-1.1	-2.0	0.9
27	130	23.7	42.0	39.2	-2.8	-2.0	-0.8
138	130	23.9	42.2	42.9	0.7	-2.0	2.7
128	130	22.5	40.8	42.5	1.7	-2.0	3.7
209	130	24.0	42.3	45.4	3.1	-2.0	5.1
52	130	22.9	41.2	40.0	-1.2	-2.0	0.8
256	130	21.6	39.9	39.5	-0.4	-2.0	1.6
103	131	24.0	42.3	40.4	-1.9	-2.0	0.2
364	131	23.5	41.8	39.2	-2.6	-2.0	-0.5
441	131	23.9	42.2	39.9	-2.3	-2.0	-0.3
328	131	24.6	42.9	41.3	-1.6	-2.0	0.4
312	131	25.3	43.6	40.8	-2.8	-2.0	-0.8
48	131	24.4	42.7	38.7	-4.0	-2.0	-2.0
3	131	23.6	41.9	39.1	-2.8	-2.0	-0.8
45	131	21.9	40.2	38.5	-1.7	-2.0	0.4
150	131	22.0	40.3	38.6	-1.6	-2.0	0.4
350	132	24.3	42.6	36.8	-5.8	-2.0	-3.8
320	132	23.1	41.4	39.5	-1.8	-2.0	0.2
135	132	23.5	41.8	39.5	-2.3	-2.0	-0.3
93	132	23.7	42.0	36.9	-5.1	-2.0	-3.1
35	132	22.5	40.8	40.4	-0.4	-2.0	1.6
125	132	23.9	42.2	39.4	-2.8	-2.0	-0.8
1	132	22.9	41.2	39.6	-1.6	-2.0	0.4

Table D.08 Tonality Assessment Table - 11.5 m/s

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Created on: 2022-04-12

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40	133	22.9	41.2	38.5	-2.7	-2.0	-0.7
327	133	22.8	41.1	39.6	-1.5	-2.0	0.5
126	133	24.2	42.5	37.9	-4.6	-2.0	-2.6
115	134	24.3	42.6	38.2	-4.4	-2.0	-2.4
169	134	21.1	39.4	39.1	-0.4	-2.0	1.6
243	134	23.8	42.1	38.5	-3.6	-2.0	-1.6
206	134	24.0	42.2	42.6	0.4	-2.0	2.4
360	135	23.2	41.5	37.4	-4.1	-2.0	-2.1
143	135	25.0	43.3	36.8	-6.5	-2.0	-4.5
170	135	22.6	40.9	38.1	-2.8	-2.0	-0.8
380	136	23.4	41.7	40.6	-1.1	-2.0	0.9
Average	130				-1.8	-2.0	0.2

Table D.09 Tonality Assessment Table - 12 m/s

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Created on: 2022-04-12

Report ID: 16115.01.T12.RP3

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
448	124	22.0	40.2	42.5	2.3	-2.0	4.3
343	125	22.7	41.0	35.9	-5.2	-2.0	-3.2
513	125	23.1	41.4	37.7	-3.7	-2.0	-1.7
370	125	24.0	42.3	41.5	-0.9	-2.0	1.1
369	126	24.2	42.5	38.7	-3.7	-2.0	-1.7
259	126	20.9	39.2	38.6	-0.6	-2.0	1.4
344	126	23.9	42.2	35.3	-6.9	-2.0	-4.9
376	126	25.4	43.7	37.1	-6.5	-2.0	-4.5
258	127	21.8	40.0	37.3	-2.7	-2.0	-0.7
84	127	24.4	42.7	39.9	-2.8	-2.0	-0.8
216	128	24.0	42.2	39.0	-3.3	-2.0	-1.2
254	128	22.6	40.9	37.0	-3.9	-2.0	-1.9
153	129	23.1	41.4	40.7	-0.7	-2.0	1.3
357	129	22.5	40.8	36.9	-3.9	-2.0	-1.9
218	129	23.1	41.4	38.1	-3.3	-2.0	-1.3
12	129	21.3	39.6	41.1	1.6	-2.0	3.6
295	129	23.9	42.2	40.2	-1.9	-2.0	0.1
392	129	23.5	41.8	40.1	-1.7	-2.0	0.3
247	129	23.2	41.5	41.1	-0.4	-2.0	1.6
164	129	24.9	43.2	37.6	-5.6	-2.0	-3.5
253	129	23.1	41.3	37.3	-4.0	-2.0	-2.0
211	130	25.0	43.3	42.2	-1.2	-2.0	0.9
127	130	23.1	41.4	41.2	-0.2	-2.0	1.8
255	130	22.3	40.6	39.7	-0.9	-2.0	1.1
248	130	22.1	40.4	40.4	0.0	-2.0	2.0
30	130	20.9	39.2	43.4	4.2	-2.0	6.3
148	130	23.5	41.7	38.5	-3.2	-2.0	-1.2
100	130	23.5	41.8	41.0	-0.8	-2.0	1.2
171	130	22.8	41.1	41.7	0.6	-2.0	2.6
372	130	24.5	42.8	41.0	-1.8	-2.0	0.2
39	130	23.6	41.8	41.0	-0.8	-2.0	1.2
368	130	22.8	41.1	41.7	0.6	-2.0	2.6
146	131	25.0	43.3	33.2	-10.0	-2.0	-8.0
293	131	22.7	41.0	41.8	0.8	-2.0	2.8
325	131	25.8	44.1	39.9	-4.1	-2.0	-2.1
439	131	22.6	40.9	40.1	-0.9	-2.0	1.2
152	131	23.7	41.9	38.7	-3.2	-2.0	-1.2
139	131	24.1	42.4	41.1	-1.3	-2.0	0.7
217	131	23.9	42.2	43.5	1.3	-2.0	3.3
31	131	21.0	39.2	43.4	4.2	-2.0	6.2
2	131	23.2	41.5	39.8	-1.7	-2.0	0.3
151	131	22.0	40.3	39.9	-0.4	-2.0	1.7
28	132	20.8	39.1	38.6	-0.5	-2.0	1.5
44	132	22.6	40.9	36.6	-4.3	-2.0	-2.3
15	132	23.8	42.1	40.2	-1.9	-2.0	0.1
257	132	22.2	40.5	38.6	-1.9	-2.0	0.2
296	132	24.5	42.8	40.2	-2.6	-2.0	-0.5
23	132	22.6	40.9	39.5	-1.4	-2.0	0.6
16	132	22.2	40.5	38.8	-1.7	-2.0	0.3
49	132	23.6	41.9	39.4	-2.5	-2.0	-0.5
381	132	22.4	40.7	40.3	-0.4	-2.0	1.6
260	132	21.4	39.7	39.9	0.1	-2.0	2.1
483	132	24.1	42.3	40.7	-1.7	-2.0	0.3

Table D.09 Tonality Assessment Table - 12 m/s

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

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283	133	25.9	44.2	40.9	-3.3	-2.0	-1.3
373	133	24.2	42.5	39.8	-2.7	-2.0	-0.7
41	133	24.2	42.5	40.7	-1.8	-2.0	0.2
114	133	23.7	42.0	36.5	-5.6	-2.0	-3.5
383	134	23.5	41.8	38.6	-3.1	-2.0	-1.1
451	134	23.8	42.1	40.5	-1.5	-2.0	0.5
382	134	23.5	41.8	41.3	-0.5	-2.0	1.5
144	134	25.9	44.2	38.1	-6.0	-2.0	-4.0
124	135	24.1	42.4	36.0	-6.5	-2.0	-4.4
284	137	24.9	43.2	42.1	-1.1	-2.0	1.0
Average	130				-1.3	-2.0	0.7

Table D.10 Tonality Assessment Table - 12.5 m/s

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-12

Measurement #	Centre frequency (Hz)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
307	124	24.8	43.1	41.1	-2.0	-2.0	0.0
342	125	21.8	40.1	38.3	-1.7	-2.0	0.3
304	127	23.5	41.7	39.5	-2.2	-2.0	-0.2
303	128	24.0	42.3	40.1	-2.2	-2.0	-0.2
356	129	22.5	40.8	37.4	-3.4	-2.0	-1.4
460	129	23.2	41.5	39.0	-2.5	-2.0	-0.5
366	129	25.6	43.9	39.4	-4.5	-2.0	-2.5
437	129	23.2	41.5	38.8	-2.7	-2.0	-0.7
481	129	22.8	41.1	41.0	-0.1	-2.0	1.9
504	130	23.8	42.1	40.1	-2.0	-2.0	0.0
24	130	21.2	39.5	39.0	-0.5	-2.0	1.5
101	130	23.9	42.1	43.3	1.2	-2.0	3.2
390	130	22.1	40.4	39.8	-0.6	-2.0	1.4
458	130	23.0	41.3	40.0	-1.3	-2.0	0.8
450	130	24.3	42.6	42.8	0.2	-2.0	2.2
149	130	23.5	41.8	39.7	-2.2	-2.0	-0.1
387	130	23.3	41.6	37.5	-4.1	-2.0	-2.0
21	130	23.4	41.7	40.1	-1.6	-2.0	0.4
305	130	24.1	42.4	38.8	-3.6	-2.0	-1.5
175	130	23.7	42.0	40.5	-1.5	-2.0	0.5
385	130	23.7	42.0	43.7	1.7	-2.0	3.7
294	131	23.2	41.5	42.9	1.5	-2.0	3.5
29	131	21.4	39.7	40.0	0.4	-2.0	2.4
518	131	21.8	40.1	35.8	-4.3	-2.0	-2.3
449	131	23.2	41.5	43.3	1.8	-2.0	3.8
46	131	24.0	42.3	41.0	-1.3	-2.0	0.8
34	131	23.2	41.5	41.0	-0.5	-2.0	1.6
386	131	24.2	42.5	38.3	-4.2	-2.0	-2.2
482	131	24.0	42.3	41.4	-0.9	-2.0	1.2
440	131	24.2	42.5	40.7	-1.8	-2.0	0.2
32	132	21.6	39.9	40.2	0.3	-2.0	2.3
291	132	22.6	40.9	41.6	0.6	-2.0	2.7
174	132	22.6	40.9	39.4	-1.5	-2.0	0.5
17	132	23.1	41.4	38.0	-3.4	-2.0	-1.4
25	132	22.1	40.4	39.1	-1.3	-2.0	0.7
251	132	23.3	41.6	40.7	-0.9	-2.0	1.1
10	132	22.6	40.9	38.8	-2.1	-2.0	0.0
250	132	22.1	40.4	40.7	0.3	-2.0	2.3
353	132	22.7	41.0	39.1	-1.9	-2.0	0.1
306	132	25.3	43.6	42.2	-1.4	-2.0	0.6
208	132	23.3	41.6	41.8	0.2	-2.0	2.3
252	133	23.5	41.8	37.5	-4.3	-2.0	-2.3
249	133	22.5	40.8	39.4	-1.4	-2.0	0.6
207	133	23.6	41.9	43.3	1.4	-2.0	3.4
210	133	24.2	42.4	41.7	-0.7	-2.0	1.3
326	133	24.8	43.1	37.9	-5.1	-2.0	-3.1
246	133	23.8	42.1	40.1	-2.1	-2.0	0.0
384	133	23.2	41.5	39.3	-2.2	-2.0	-0.2
145	134	27.0	45.3	36.7	-8.5	-2.0	-6.5
354	134	22.2	40.5	39.0	-1.6	-2.0	0.5
442	135	24.6	42.9	39.4	-3.5	-2.0	-1.5
452	135	23.6	41.9	40.7	-1.2	-2.0	0.8
281	135	25.3	43.6	42.5	-1.1	-2.0	0.9

Table D.10 Tonality Assessment Table - 12.5 m/s

Created on: 2022-04-12

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12
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99	135	24.3	42.6	38.2	-4.4	-2.0	-2.4
244	135	24.5	42.8	40.5	-2.3	-2.0	-0.3
285	136	23.6	41.9	42.1	0.3	-2.0	2.3
Average	131				-1.3	-2.0	0.7

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Appendix E
Measurement Data

Table E.01 Measurement data - Turbine ON

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-13

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
1	11.7	51.3	3465	277.0	279.8	18.0	10.8	10.8	8.2	4.8	100709.8	48
2	11.9	51.0	3468	277.0	279.9	18.0	10.8	11.0	7.7	4.8	100709.9	49
3	11.7	50.7	3461	277.0	279.9	18.0	10.8	10.8	9.6	4.8	100710.2	51
4			3468	277.0	280.2	18.0	10.7	9.8	9.6	4.8	100710.2	51
5	13.0	51.4	3462	277.0	280.4	18.0	11.2	12.0	9.4	4.8	100710.4	51
6	12.9	50.8	3458	277.0	279.8	18.0	10.9	11.9	9.3	4.8	100710.7	51
7	13.4	51.1	3468	277.0	279.8	18.0	10.8	12.4	8.9	4.8	100710.7	51
8	13.4	51.3	3464	277.0	279.8	18.0	11.0	12.4	7.7	4.8	100710.8	50
9	13.7	51.3	3465	277.0	279.8	18.0	11.0	12.7	7.1	4.8	100710.9	50
10	12.7	50.8	3457	277.0	279.8	18.0	10.8	11.8	10.0	4.8	100711.2	50
11	12.8	50.6	3460	277.0	279.8	18.0	10.7	11.9	10.2	4.8	100711.1	50
12	11.9	50.4	3458	277.0	279.8	18.0	10.6	11.0	9.5	4.8	100711.0	50
13	11.3	50.5	3422	277.0	279.8	18.0	10.4	10.5	9.8	4.8	100710.8	50
14			3440	277.0	280.2	18.0	10.5	9.7	10.4	4.8	100711.3	50
15	11.8	51.3	3484	277.0	279.9	18.0	11.0	10.9	10.0	4.8	100711.7	50
16	12.0	50.7	3461	277.0	279.8	18.0	10.9	11.1	10.3	4.8	100711.7	50
17	12.5	52.2	3469	277.0	279.8	18.0	10.8	11.6	10.2	4.8	100711.2	50
18	13.2	51.5	3465	277.0	279.9	18.0	11.0	12.2	10.1	4.8	100710.9	50
19	13.4	51.0	3464	277.0	280.1	18.0	10.9	12.4	9.1	4.8	100710.7	50
20	12.9	51.0	3456	277.0	279.8	18.0	10.7	11.9	9.3	4.8	100710.5	49
21	12.3	51.4	3467	277.0	279.9	18.0	10.7	11.3	9.9	4.8	100710.4	48
22	13.0	52.1	3463	277.0	280.1	18.0	10.8	12.0	9.9	4.8	100709.4	48
23	12.1	51.7	3464	277.0	279.9	18.0	10.8	11.2	10.1	4.8	100709.0	48
24	12.5	50.4	3462	277.0	279.8	18.0	10.8	11.5	9.6	4.8	100709.1	48
25	12.5	50.9	3465	277.0	279.8	18.0	10.8	11.5	9.3	4.8	100709.3	48
26			3333	277.0	279.8	18.0	10.2	9.9	8.7	4.8	100709.2	48
27	11.4	51.1	3425	277.0	280.1	18.0	10.6	10.5	9.4	4.8	100709.2	48
28	11.8	50.5	3464	277.0	279.8	18.0	10.9	10.9	9.7	4.8	100709.6	48
29	12.3	50.7	3461	277.0	279.8	18.0	10.8	11.3	9.8	4.8	100709.7	48
30	12.2	50.5	3463	277.0	279.8	18.0	10.7	11.2	9.7	4.8	100710.0	48
31	11.9	50.8	3466	277.0	279.8	18.0	10.7	11.0	9.5	4.8	100710.2	48
32	12.6	51.0	3467	277.0	279.8	18.0	10.8	11.6	9.8	4.8	100710.1	48
33	12.9	50.6	3453	277.0	279.8	18.0	10.7	11.9	8.4	4.8	100710.1	48
34	12.4	51.1	3474	277.0	279.8	18.0	10.7	11.4	7.3	4.8	100709.9	48
35	11.4	50.7	3459	277.0	279.8	18.0	10.8	10.5	7.9	4.8	100710.2	48
36	11.4	50.1	3423	277.0	278.6	18.0	10.5	10.5	9.3	4.8	100709.9	48
37	11.7	50.7	3377	277.0	275.1	18.0	10.3	10.8	8.7	4.8	100710.2	48
38	11.6	51.0	3445	277.0	275.0	18.0	10.5	10.7	8.1	4.8	100710.0	50
39	11.8	51.0	3477	277.0	278.3	18.0	10.8	10.9	7.3	4.8	100710.0	50
40	11.7	50.8	3465	277.0	279.8	18.0	10.9	10.8	7.8	4.8	100709.8	50
41	12.0	51.8	3465	277.0	279.8	18.0	10.9	11.1	8.0	4.8	100709.7	50
42	11.7	51.6	3430	277.0	279.8	18.0	10.5	10.8	7.6	4.8	100709.8	50
43	11.3	51.0	3432	277.0	280.1	18.0	10.4	10.5	8.8	4.8	100709.7	51
44	11.8	50.6	3484	277.0	282.6	18.0	10.8	10.9	8.8	4.8	100709.5	51
45	11.4	50.1	3462	277.0	282.8	18.0	10.8	10.6	8.1	4.8	100709.3	51
46	12.3	51.1	3464	277.0	282.8	18.0	10.7	11.4	7.7	4.8	100709.8	51
47	11.5	50.9	3454	277.0	282.8	18.0	10.6	10.6	7.2	4.8	100710.1	51
48	11.7	51.5	3473	277.0	282.8	18.0	10.7	10.8	7.5	4.8	100710.2	51
49	12.0	51.1	3464	277.0	282.8	18.0	10.8	11.1	9.5	4.9	100711.3	51
50	11.6	51.8	3462	277.0	282.8	18.0	10.7	10.7	9.1	4.9	100711.7	51
51			3467	277.0	282.8	18.0	10.9	10.3	8.3	4.9	100711.7	51
52	11.4	50.7	3453	277.0	282.8	18.0	10.9	10.6	8.4	4.9	100711.7	51
53			3436	277.0	282.8	18.0	10.5	9.0	7.6	4.9	100711.9	51
54	10.6	51.3	3195	277.0	282.8	18.0	10.3	9.2	7.9	4.9	100712.0	51
55	10.3	51.1	3119	277.0	282.8	18.0	10.3	9.0	8.2	4.9	100712.1	51
56	10.2	50.6	3099	277.0	282.8	18.0	10.3	9.1	8.0	4.9	100712.0	51
57	9.4	50.4	2802	277.0	282.8	18.0	10.1	8.9	8.1	4.9	100712.1	51
58	9.0	50.1	2590	277.0	282.8	18.0	10.1	8.2	7.7	4.9	100712.2	51
59	9.5	50.1	2823	277.0	282.8	20.4	10.2	7.5	7.6	4.9	100712.0	51
60	9.4	49.7	2781	277.0	282.6	66.0	10.1	8.3	8.8	4.9	100712.1	51
61	9.4	50.4	2794	277.0	279.7	66.0	10.1	8.2	9.0	4.9	100712.2	51
62	9.6	49.9	2861	277.0	278.8	66.0	10.2	8.7	9.4	4.9	100712.2	50
63	10.3	50.4	3118	277.0	278.8	66.0	10.3	9.8	8.3	4.9	100712.2	50
64	9.7	50.4	2912	277.0	278.8	66.0	10.2	9.1	7.7	4.9	100712.3	50
65	9.6	50.5	2892	277.0	278.8	63.4	10.2	9.4	7.4	4.9	100712.1	50
66	9.2	50.3	2699	277.0	278.8	18.0	10.1	8.7	7.2	4.9	100712.0	50
67	8.5	50.4	2298	277.0	278.8	18.0	10.0	8.4	7.8	4.9	100712.1	49
68	8.6	50.0	2396	277.0	278.8	18.0	10.0	8.3	8.2	4.9	100711.9	48
69	9.2	49.8	2702	277.0	278.8	18.0	10.1	8.5	6.8	4.9	100711.9	48
70	9.7	50.1	2911	277.0	278.8	18.0	10.2	8.6	7.8	4.9	100711.8	48
71	9.8	50.6	2979	277.0	278.8	22.4	10.2	9.2	7.5	4.9	100712.1	48
72	9.4	50.0	2779	277.0	278.8	90.0	10.1	9.1	6.7	4.9	100712.0	48
73	9.2	50.4	2721	277.0	278.8	90.0	10.1	7.6	6.4	4.9	100712.1	49
74	9.4	50.2	2782	277.0	278.8	90.0	10.1	7.9	7.2	4.9	100712.2	51
75	9.7	49.9	2931	277.0	278.8	90.0	10.2	9.2	7.3	4.9	100712.5	51
76	9.9	50.5	2990	277.0	278.8	90.0	10.2	8.6	7.5	4.9	100712.9	51
77	10.1	50.8	3085	277.0	278.8	85.6	10.3	8.8	7.5	4.9	100712.7	51
78	10.4	50.5	3141	277.0	278.8	18.0	10.3	9.0	6.3	4.9	100712.4	51
79	10.9	50.9	3271	277.0	278.8	18.0	10.3	10.0	6.6	5.0	100712.5	52
80	10.9	50.6	3266	277.0	278.8	18.0	10.3	9.6	8.3	5.0	100712.3	53
81	11.4	50.7	3404	277.0	278.8	18.0	10.4	10.5	7.3	5.0	100712.4	53
82			3444	277.0	278.8	18.0	10.5	10.3	7.3	5.0	100712.4	53
83	11.0	50.8	3290	277.0	278.8	18.0	10.3	9.6	7.6	5.0	100712.7	53
84	11.9	51.4	3384	277.0	278.8	18.0	10.4	11.0	7.5	5.0	100712.7	52
85	11.6	50.7	3320	277.0	278.8	18.0	10.4	10.7	7.9	5.0	100712.7	50
86	10.3	49.7	3134	277.0	278.8	18.0	10.3	9.1	8.1	5.0	100712.7	50
87	9.9	49.8	3000	277.0	278.8	18.0	10.2	8.9	8.6	5.0	100712.5	50
88	10.7	49.7	3219	277.0	278.8	18.0	10.3	9.2	7.8	5.0	100712.6	50

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
89			3376	277.0	278.8	18.0	10.4	9.4	8.1	5.0	100712.6	50
90			3481	277.0	278.8	18.0	10.9	10.4	8.4	5.0	100712.6	50
91			3465	277.0	278.8	18.0	10.9	9.6	7.8	5.0	100712.5	49
92			3463	277.0	278.8	18.0	10.9	10.4	8.1	5.0	100712.6	49
93	11.4	50.8	3457	277.0	278.8	18.0	10.9	10.5	9.1	5.0	100712.4	49
94	10.5	49.7	3177	277.0	278.8	18.0	10.3	9.1	9.3	5.0	100712.4	49
95	10.2	49.6	3089	277.0	278.8	18.0	10.3	9.4	9.7	5.0	100712.4	49
96	10.4	50.4	3158	277.0	278.7	18.0	10.3	8.4	8.8	5.1	100712.4	48
97	9.4	50.5	2798	277.0	278.8	18.0	10.1	7.9	7.9	5.0	100712.5	48
98			3399	277.0	278.8	18.0	10.5	9.5	9.2	5.0	100712.6	48
99	12.4	51.4	3467	277.0	278.8	18.0	11.0	11.5	9.0	5.0	100712.6	48
100	12.2	50.8	3459	277.0	278.8	18.0	10.8	11.3	8.4	5.0	100712.6	48
101	12.6	52.1	3468	277.0	278.8	18.0	10.7	11.6	8.6	5.0	100712.6	48
102	11.4	52.2	3457	277.0	278.8	18.0	10.8	10.5	9.0	5.1	100712.7	48
103	11.7	51.2	3462	277.0	278.8	18.0	10.8	10.8	10.0	5.0	100712.7	47
104			3461	277.0	278.8	18.0	10.6	10.3	10.1	5.0	100712.7	47
105			3450	277.0	278.8	18.0	10.5	9.4	10.1	5.0	100712.9	47
106			3450	277.0	278.8	18.0	10.5	10.2	9.6	5.0	100712.7	47
107			3480	277.0	278.8	18.0	10.9	10.2	9.1	5.0	100712.4	47
108			3455	277.0	278.8	18.0	10.7	10.4	8.8	5.0	100712.5	47
109			3450	277.0	278.8	18.0	10.5	10.5	8.8	5.0	100712.6	46
110			3445	277.0	278.8	18.0	10.5	9.4	8.5	5.0	100712.7	46
111	11.3	50.9	3395	277.0	278.8	18.0	10.4	10.4	8.1	5.0	100712.7	46
112	10.3	50.5	3115	277.0	278.8	18.0	10.3	9.5	8.8	5.0	100712.7	46
113			3389	277.0	278.8	18.0	10.4	9.5	8.5	5.0	100712.6	46
114	12.0	51.4	3473	277.0	278.8	18.0	11.0	11.0	7.2	5.0	100712.5	47
115	11.6	51.7	3467	277.0	278.8	18.0	11.0	10.7	7.8	5.0	100712.4	51
116	11.6	51.1	3451	277.0	278.8	18.0	10.8	10.7	8.5	5.0	100712.3	51
117			3326	277.0	278.8	18.0	10.3	10.0	8.3	5.0	100712.4	51
118	10.4	50.5	3146	277.0	278.8	18.0	10.3	9.5	7.0	5.0	100712.2	51
119			3325	277.0	278.8	18.0	10.4	9.4	7.6	5.0	100712.1	51
120	11.0	51.4	3285	277.0	278.8	18.0	10.3	9.4	7.1	5.0	100712.0	51
121			3471	277.0	278.8	18.0	10.6	9.9	9.2	5.0	100709.7	50
122			3386	277.0	278.8	18.0	10.5	9.3	8.6	5.0	100709.8	50
123	11.4	51.6	3459	277.0	278.8	18.0	10.6	10.5	9.6	5.0	100709.9	50
124	12.0	51.6	3465	277.0	278.8	18.0	11.0	11.1	9.9	5.0	100710.8	50
125	11.6	52.5	3459	277.0	278.8	18.0	10.8	10.8	9.1	5.0	100711.0	50
126	11.5	53.1	3466	277.0	278.8	18.0	10.9	10.6	8.8	5.1	100710.8	51
127	12.2	51.5	3459	277.0	278.8	18.0	10.7	11.3	8.6	5.1	100710.8	51
128	11.7	51.2	3461	277.0	278.8	18.0	10.6	10.8	7.4	5.1	100710.8	51
129			3445	277.0	278.8	18.0	10.5	10.4	7.9	5.1	100710.8	51
130			3383	277.0	278.8	18.0	10.4	9.4	9.4	5.1	100710.8	51
131	10.3	50.6	3128	277.0	278.8	18.0	10.3	8.8	8.4	5.1	100710.9	51
132	10.6	50.6	3206	277.0	278.8	18.0	10.3	9.3	9.1	5.1	100710.8	50
133			3464	277.0	278.8	18.0	10.6	10.4	9.0	5.1	100710.9	50
134			3470	277.0	278.8	18.0	10.8	10.0	10.0	5.1	100710.8	50
135	11.3	51.2	3462	277.0	278.8	18.0	10.8	10.4	9.8	5.1	100710.8	50
136			3371	277.0	278.8	18.0	10.5	9.4	9.1	5.1	100710.7	50
137	11.6	51.2	3440	277.0	278.8	18.0	10.5	10.8	8.9	5.1	100710.0	50
138	11.5	51.8	3467	277.0	278.8	18.0	10.7	10.6	9.7	5.1	100710.1	47
139	11.8	51.2	3466	277.0	278.8	18.0	10.9	10.9	9.0	5.1	100710.6	47
140			3400	277.0	278.8	18.0	10.5	9.6	8.2	5.1	100710.3	47
141	10.1	50.8	3069	277.0	278.8	18.0	10.3	9.0	8.4	5.1	100710.5	47
142	11.0	51.1	3291	277.0	278.8	18.0	10.4	9.5	8.2	5.1	100712.0	47
143	11.5	51.6	3479	277.0	278.7	18.0	11.0	10.7	9.6	5.1	100712.5	47
144	11.9	52.0	3459	277.0	276.4	18.0	11.0	11.0	8.9	5.1	100712.5	47
145	12.3	51.7	3463	277.0	275.8	18.0	10.9	11.4	10.0	5.1	100712.8	47
146	12.1	50.9	3463	277.0	275.8	18.0	10.8	11.2	9.4	5.1	100713.1	47
147	12.9	51.2	3459	277.0	275.8	18.0	10.9	11.9	8.0	5.1	100713.3	47
148	11.9	50.9	3464	277.0	275.8	18.0	10.7	11.0	7.1	5.1	100713.7	47
149	12.6	51.7	3463	277.0	275.8	18.0	10.7	11.6	7.7	5.1	100712.1	47
150	11.7	51.1	3465	277.0	275.8	18.0	10.8	10.8	7.8	5.1	100713.3	48
151	11.9	50.5	3457	277.0	275.8	18.0	10.7	11.0	8.5	5.1	100713.1	48
152	12.0	51.5	3467	277.0	275.8	18.0	10.7	11.1	7.7	5.1	100714.8	48
153	11.8	51.1	3460	277.0	275.8	18.0	10.6	10.9	7.4	5.1	100713.9	48
154	11.6	51.2	3424	277.0	275.8	18.0	10.4	10.7	8.0	5.1	100714.4	48
155	11.7	50.7	3393	277.0	275.8	18.0	10.3	10.8	9.2	5.1	100714.7	48
156	10.9	50.2	3278	277.0	275.8	18.0	10.3	9.4	9.3	5.1	100714.6	50
157	10.7	50.7	3212	277.0	275.8	18.0	10.3	9.7	10.2	5.1	100713.6	50
158	9.9	50.3	3021	277.0	275.8	18.0	10.2	9.3	9.2	5.1	100713.6	50
159	10.0	50.4	3059	277.0	275.8	18.0	10.2	10.3	9.2	5.1	100714.3	50
160	9.8	50.4	2982	277.0	275.8	18.0	10.2	9.2	9.5	5.1	100714.7	50
161	11.0	50.4	3292	277.0	275.8	18.0	10.3	10.2	9.0	5.1	100714.9	47
162	11.3	50.1	3335	277.0	275.8	18.0	10.4	10.5	8.1	5.1	100714.7	46
163			3361	277.0	275.8	18.0	10.4	10.0	8.2	5.1	100714.5	46
164	11.9	51.2	3454	277.0	277.5	18.0	10.6	11.0	9.5	5.1	100714.5	46
165	11.0	51.2	3288	277.0	280.6	18.0	10.4	10.6	10.3	5.1	100714.4	46
166	11.7	51.2	3450	277.0	280.8	18.0	10.5	10.8	8.7	5.1	100714.3	46
167			3486	277.0	280.8	18.0	10.7	10.3	10.0	5.1	100714.5	48
168			3462	277.0	280.8	18.0	11.0	10.2	9.6	5.1	100711.7	48
169	11.3	50.8	3462	277.0	280.8	18.0	11.0	10.4	9.6	5.1	100713.7	48
170	11.7	51.0	3465	277.0	280.8	18.0	11.1	10.8	8.8	5.1	100714.3	48
171	12.2	51.0	3455	277.0	280.8	18.0	10.8	11.3	10.1	5.1	100714.1	48
172	11.4	50.8	3391	277.0	280.8	18.0	10.3	10.6	9.4	5.1	100714.1	48
173			3377	277.0	280.8	18.0	10.4	10.0	9.5	5.1	100724.4	46
174	12.7	51.0	3491	277.0	280.8	18.0	10.8	11.7	8.9	5.1	100727.1	45
175	12.3	50.9	3450	277.0	280.8	18.0	10.8	11.4	7.7	5.1	100727.2	45
176	11.7	50.9	3439	277.0	280.8	18.0	10.5	10.8	8.4	5.1	100727.2	45

Table E.01 Measurement data - Turbine ON

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-13

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (Pa)	Relative Humidity (%)
177			3449	277.0	280.8	18.0	10.6	10.2	8.0	5.1	100727.2	45
178	11.1	50.7	3301	277.0	280.8	18.0	10.3	10.4	9.1	5.1	100727.2	45
179	10.0	50.3	3060	277.0	280.8	18.0	10.3	10.0	9.0	5.1	100726.9	47
180	9.5	50.5	2813	277.0	280.8	18.0	10.2	9.4	9.1	5.1	100727.2	47
181	9.4	50.1	2776	277.0	280.8	18.0	10.1	9.0	8.7	5.1	100726.7	47
182	9.6	50.0	2861	277.0	280.8	18.0	10.2	9.0	9.1	5.1	100726.8	47
183	9.4	50.1	2789	277.0	280.8	18.0	10.1	9.8	9.1	5.1	100726.2	47
184	8.1	49.0	2121	277.0	280.8	18.0	9.9	7.9	9.1	5.1	100726.5	47
185	7.8	49.6	1898	277.0	280.8	18.0	9.9	7.6	9.7	5.1	100726.9	47
186	8.4	50.2	2242	277.0	280.8	18.0	10.1	8.6	9.3	5.1	100727.1	47
187	9.5	49.9	2836	277.0	280.8	18.0	10.3	8.4	8.8	5.1	100727.0	47
188	9.4	49.7	2808	277.0	280.8	18.0	10.1	9.2	9.2	5.1	100727.1	47
189	9.9	50.0	3020	277.0	280.8	18.0	10.2	9.3	9.0	5.1	100725.7	47
190	10.0	49.9	3037	277.0	280.8	18.0	10.2	9.5	9.1	5.1	100725.9	47
191	10.0	50.3	3035	277.0	280.8	18.0	10.2	9.9	8.4	5.1	100726.7	47
192	10.5	50.0	3182	277.0	280.8	18.0	10.3	10.0	7.1	5.1	100726.9	47
193	10.0	50.2	3031	277.0	280.8	18.0	10.2	9.7	6.4	5.1	100726.9	47
194	9.4	50.2	2803	277.0	280.8	18.0	10.1	9.8	6.4	5.1	100726.9	47
195	9.6	49.9	2894	277.0	280.8	18.0	10.2	9.2	8.2	5.1	100726.6	47
196	10.0	49.6	3043	277.0	280.8	18.0	10.2	9.9	7.7	5.1	100726.6	47
197	10.1	49.9	3082	277.0	280.8	18.0	10.3	10.0	7.0	5.1	100726.5	49
198	9.7	50.0	2914	277.0	280.8	18.0	10.2	9.3	6.7	5.1	100726.5	49
199	8.8	50.8	2489	277.0	280.8	18.0	10.0	8.2	7.0	5.9	100742.9	47
200	9.8	52.8	2955	277.0	280.8	28.3	10.2	8.4	7.9	5.9	100743.1	47
201	10.9	52.6	3263	277.0	280.8	90.0	10.3	9.7	7.2	5.9	100743.2	47
202			3429	277.0	280.8	90.0	10.4	9.8	8.2	5.9	100743.0	47
203			3466	277.0	280.8	90.0	10.7	10.1	9.7	5.9	100742.6	48
204			3468	277.0	280.8	90.0	10.7	9.6	9.5	5.9	100742.8	48
205			3469	277.0	280.8	90.0	10.7	9.2	8.6	5.9	100743.1	48
206	11.6	51.0	3460	277.0	280.8	79.7	11.0	10.7	9.0	5.9	100742.5	48
207	12.6	51.2	3464	277.0	280.8	18.0	11.0	11.7	8.1	5.9	100742.0	48
208	12.5	51.8	3459	277.0	280.8	18.0	10.9	11.6	8.5	5.9	100741.0	48
209	11.7	51.8	3464	277.0	280.8	18.0	10.7	10.8	8.7	5.9	100730.1	49
210	12.6	50.9	3464	277.0	280.8	18.0	10.9	11.7	8.8	5.9	100730.1	49
211	11.9	51.2	3455	277.0	280.8	18.0	10.6	11.0	8.8	5.9	100730.5	49
212			3462	277.0	280.8	18.0	10.2	9.8	10.3	5.9	100730.4	49
213			3390	277.0	280.8	18.0	10.3	10.0	10.6	5.9	100730.7	49
214			3416	277.0	280.8	18.0	10.4	9.6	9.7	5.9	100734.6	48
215	10.7	51.2	3226	277.0	280.8	18.0	10.3	10.1	9.3	6.0	100756.6	46
216	11.9	50.1	3392	277.0	280.8	18.0	10.4	11.0	9.8	6.0	100756.4	46
217	12.0	50.7	3465	277.0	280.8	18.0	10.7	11.1	9.9	6.0	100756.0	46
218	11.9	50.7	3364	277.0	283.1	18.0	10.5	11.0	9.4	6.0	100756.6	46
219			3374	277.0	287.6	18.0	10.4	10.1	9.1	6.0	100757.0	46
220	10.7	50.2	3225	277.0	292.0	18.0	10.3	10.6	8.4	6.0	100756.9	46
221			3045	277.0	296.4	18.0	10.2	9.4	7.1	6.0	100757.0	43
222			3149	277.0	297.7	18.0	10.3	9.3	6.9	6.0	100757.0	43
223			3441	277.0	297.7	18.0	10.4	10.8	6.2	6.0	100756.7	43
224			3294	277.0	297.7	18.0	10.3	9.7	6.5	6.0	100756.5	43
225			3103	277.0	297.7	18.0	10.3	8.2	6.4	6.0	100756.7	43
226			2603	277.0	297.7	18.0	10.1	7.1	6.8	6.0	100756.8	44
227			2304	277.0	296.6	18.0	10.0	7.2	7.2	6.0	100756.6	53
228			2059	277.0	292.4	18.0	9.9	7.5	9.3	6.0	100756.7	53
229	8.8	48.9	2480	277.0	288.0	18.0	10.1	8.2	8.1	6.0	100757.0	53
230	9.5	49.2	2840	277.0	285.8	18.0	10.2	7.6	9.8	6.0	100756.7	53
231	9.6	48.8	2874	277.0	285.8	18.0	10.2	9.0	10.3	6.0	100756.8	53
232	9.6	49.3	2867	277.0	285.8	18.0	10.2	9.2	10.6	6.1	100756.7	52
233	9.1	49.4	2650	277.0	285.8	18.0	10.1	8.6	9.6	6.1	100756.5	47
234	8.7	48.5	2463	277.0	285.8	18.0	10.0	8.2	9.0	6.1	100756.9	47
235	8.7	48.4	2426	277.0	285.8	18.0	10.0	8.3	9.2	6.1	100757.0	47
236	8.8	48.8	2508	277.0	285.8	18.0	10.0	8.0	8.8	6.1	100756.0	47
237	9.3	49.2	2763	277.0	285.8	18.0	10.1	8.4	8.7	6.1	100757.1	47
238	9.1	49.7	2652	277.0	285.8	18.0	10.1	8.9	8.4	6.1	100756.8	47
239	9.0	49.3	2612	277.0	285.8	18.0	10.1	8.4	7.7	6.1	100756.5	44
240	8.8	50.0	2484	277.0	285.8	18.0	10.0	8.1	8.5	6.1	100756.0	44
241	9.7	50.7	2926	277.0	285.8	30.2	10.2	8.5	9.5	6.1	100756.7	44
242			3475	277.0	285.8	90.0	10.6	10.2	12.6	6.1	100756.8	44
243	11.5	51.0	3464	277.0	285.8	90.0	11.1	10.7	13.3	6.1	100756.3	44
244	12.4	51.8	3462	277.0	285.8	90.0	11.1	11.4	10.7	6.1	100756.3	45
245	12.8	51.7	3456	277.0	285.8	90.0	10.9	11.8	10.5	6.1	100755.9	45
246	12.7	52.8	3463	277.0	285.8	90.0	10.9	11.7	10.3	6.1	100755.8	45
247	12.0	51.9	3460	277.0	285.8	77.8	10.7	11.1	10.0	6.1	100755.9	45
248	12.0	51.0	3470	277.0	285.8	18.0	10.8	11.1	10.5	6.1	100756.7	45
249	12.3	51.0	3460	277.0	285.8	18.0	10.8	11.4	10.1	6.1	100756.8	44
250	12.4	50.7	3463	277.0	285.8	18.0	10.8	11.4	10.4	6.1	100756.7	42
251	12.7	50.5	3463	277.0	287.9	18.0	10.9	11.7	10.8	6.1	100756.5	42
252	12.5	50.5	3462	277.0	288.7	18.0	10.9	11.6	9.7	6.1	100755.9	42
253	12.2	51.2	3457	277.0	288.7	18.0	10.7	11.2	8.9	6.1	100756.7	42
254	12.1	50.4	3465	277.0	288.7	18.0	10.5	11.2	8.4	6.1	100757.3	42
255	11.9	49.9	3465	277.0	288.7	18.0	10.6	11.0	7.1	6.1	100757.2	43
256	11.7	50.1	3467	277.0	288.7	18.0	10.7	10.8	8.1	6.0	100757.4	47
257	11.9	50.4	3458	277.0	288.7	18.0	10.7	11.0	8.3	6.0	100757.4	47
258	12.2	50.7	3459	277.0	288.7	18.0	10.4	11.3	8.7	6.0	100757.2	47
259	11.8	49.9	3469	277.0	288.7	18.0	10.4	10.9	8.4	6.0	100757.4	47
260	12.0	50.5	3463	277.0	288.7	18.0	10.8	11.1	8.2	6.0	100757.4	47
261	11.7	49.8	3458	277.0	288.7	18.0	10.6	10.8	9.0	6.0	100757.1	46
262			3464	277.0	288.7	18.0	10.5	10.4	7.9	6.0	100757.1	45
263			3469	277.0	288.7	18.0	10.6	9.8	8.3	6.0	100757.1	45
264			3464	277.0	288.7	18.0	10.9	9.8	8.1	6.0	100757.3	45

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (Pa)	Relative Humidity (%)
265	11.5	49.9	3459	277.0	288.7	18.0	10.8	10.6	7.5	6.0	100757.5	45
266			3377	277.0	288.7	18.0	10.4	9.9	7.7	6.0	100756.7	45
267	11.0	49.9	3295	277.0	288.7	18.0	10.3	9.5	7.7	6.0	100757.3	45
268	10.2	49.4	3105	277.0	288.7	18.0	10.3	9.4	8.4	5.9	100757.5	46
269	9.5	49.4	2814	277.0	288.7	18.0	10.2	8.9	8.3	5.9	100757.7	46
270	8.4	48.9	2290	277.0	288.7	18.0	9.9	8.5	8.7	5.9	100757.6	46
271	7.9	48.7	1978	277.0	288.7	18.0	9.9	8.6	9.7	5.9	100757.7	46
272	7.9	48.8	1960	277.0	288.7	18.0	10.0	7.9	9.2	5.9	100757.7	46
273	8.6	49.4	2394	277.0	288.7	18.0	10.1	8.2	8.8	5.9	100755.7	45
274	9.3	49.6	2730	277.0	288.7	18.0	10.2	9.4	8.7	5.9	100743.6	42
275	8.7	49.4	2449	277.0	288.3	18.0	10.0	7.6	8.8	5.9	100743.5	42
276	9.8	49.5	2952	277.0	285.9	18.0	10.2	9.2	8.4	5.9	100743.7	42
277	10.3	50.1	3121	277.0	284.6	22.6	10.3	8.0	8.0	5.9	100743.7	42
278			3458	277.0	280.3	42.0	10.6	10.3	7.5	5.9	100742.5	42
279	11.2	50.9	3315	277.0	271.8	42.0	10.4	9.9	7.7	5.8	100742.8	43
280	11.6	51.0	3462	277.0	271.4	42.0	10.6	10.7	7.5	5.8	100742.6	43
281	12.3	51.6	3457	277.0	275.5	42.0	11.0	11.4	8.4	5.8	100742.4	43
282			3447	277.0	279.3	37.3	10.5	10.3	7.5	5.8	100742.9	43
283	11.8	51.7	3469	277.0	279.8	18.0	10.8	10.9	6.6	5.8	100743.2	43
284	11.8	51.3	3458	277.0	279.8	18.0	11.1	10.9	6.7	5.8	100744.0	44
285	12.3	51.1	3466	277.0	279.8	18.0	11.0	11.3	9.0	5.8	100743.7	49
286	13.6	51.0	3463	277.0	279.8	18.0	11.1	12.6	8.8	5.8	100743.3	49
287	13.3	51.0	3460	277.0	279.8	18.0	10.9	12.3	9.7	5.8	100743.5	49
288	14.2	52.0	3466	277.0	279.8	18.0	10.8	13.1	9.0	5.8	100743.9	49
289	13.0	50.9	3459	277.0	279.8	18.0	10.7	12.0	7.4	5.8	100743.3	49
290	11.7	50.6	3463	277.0	279.8	18.0	10.4	10.8	8.8	5.8	100744.9	48
291	12.6	50.8	3462	277.0	279.8	18.0	10.7	11.6	10.7	5.8	100757.4	46
292	13.2	50.7	3462	277.0	279.8	18.0	10.6	12.2	10.2	5.8	100757.2	46
293	12.2	50.7	3469	277.0	279.8	18.0	10.6	11.3	9.7	5.8	100756.8	46
294	12.3	51.0	3455	277.0	279.8	18.0	10.7	11.3	8.6	5.8	100756.7	46
295	12.2	51.2	3469	277.0	279.8	18.0	10.5	11.2	8.3	5.8	100757.4	46
296	11.9	50.8	3466	277.0	279.8	18.0	10.9	11.0	9.6	5.8	100755.1	46
297	13.3	50.9	3465	277.0	279.8	18.0	10.9	12.3	8.1	5.8	100743.5	44
298	13.0	51.3	3465	277.0	279.8	18.0	11.0	12.0	9.5	5.8	100743.6	44
299	13.6	51.2	3460	277.0	279.8	18.0	11.0	12.6	9.3	5.8	100743.4	44
300	14.1	51.2	3456	277.0	279.8	18.0	10.9	13.0	10.2	5.8	100742.5	44
301	13.7	51.2	3465	277.0	279.8	18.0	10.7	12.6	9.1	5.8	100743.0	44
302	12.9	51.0	3462	277.0	279.8	18.0	10.7	11.9	11.4	5.8	100742.0	44
303	12.5	50.7	3463	277.0	279.8	18.0	10.5	11.6	10.3	5.8	100731.4	44
304	12.3	50.2	3458	277.0	279.8	18.0	10.5	11.4	11.1	5.8	100731.2	44
305	12.4	50.3	3472	277.0	279.8	18.0	10.5	11.4	11.5	5.8	100731.1	44
306	12.4	51.2	3462	277.0	279.8	18.0	10.8	11.5	10.6	5.8	100731.5	44
307	12.4	50.6	3442	277.0	279.8	18.0	10.3	11.5	10.2	5.8	100731.3	44
308	10.4	50.3	3160	277.0	279.8	18.0	10.1	9.7	9.5	5.8	100733.0	44
309	9.9	50.3	2992	277.0	279.8	18.0	10.2	9.3	9.1	5.7	100743.2	45
310	11.0	50.4	3286	277.0	279.8	18.0	10.3	9.8	8.0	5.7	100742.4	45
311			3459	277.0	279.8	18.0	10.5	10.4	9.1	5.7	100742.9	45
312	11.3	50.9	3457	277.0	279.8	18.0	10.6	10.4	9.7	5.7	100743.0	45
313	10.8	49.9	3240	277.0	279.8	18.0	10.4	9.8	9.0	5.7	100742.8	45
314	11.2	50.2	3318	277.0	279.8	18.0	10.4	9.5	9.6	5.7	100742.9	45
315	10.7	50.1	3215	277.0	279.8	18.0	10.3	10.4	9.8	5.7	100742.9	46
316	9.6	50.0	2869	277.0	279.8	18.0	10.2	9.0	8.9	5.7	100743.3	46
317	10.0	51.3	3046	277.0	279.8	18.0	10.2	9.4	8.2	5.7	100743.7	46
318			3436	277.0	279.8	18.0	10.5	9.9	10.1	5.7	100743.5	46
319			3402	277.0	279.8	18.0	10.4	10.3	9.8	5.7	100743.4	46
320	11.7	50.5	3472	277.0	279.8	18.0	10.7	10.8	9.0	5.7	100755.0	43
321			3459	277.0	279.8	18.0	10.8	10.4	9.2	5.7	100755.9	43
322			3458	277.0	279.8	18.0	10.8	10.1	9.2	5.7	100756.0	43
323			3396	277.0	279.8	18.0	10.4	9.1	7.8	5.7	100756.0	43
324			3470	277.0	279.8	18.0	10.7	9.7	7.7	5.7	100755.4	43
325	12.1	51.4	3459	277.0	279.8	18.0	10.8	11.2	7.7	5.7	100755.8	43
326	12.7	50.8	3466	277.0	279.8	18.0	11.0	11.8	8.9	5.7	100756.4	47
327	11.6	51.3	3458	277.0	279.8	18.0	10.9	10.7	8.6	5.7	100756.0	48
328	11.6	51.5	3471	277.0	279.8	18.0	10.9	10.7	8.5	5.7	100756.1	48
329	13.8	52.1	3456	277.0	279.8	18.0	11.0	12.7	9.0	5.7	100755.7	48
330	13.5	52.0	3463	277.0	279.8	18.0	10.8	12.5	8.8	5.7	100755.4	48
331	13.4	52.8	3464	277.0	279.8	18.0	10.7	12.4	8.4	5.7	100755.4	48
332	13.8	51.6	3463	277.0	279.8	18.0	10.8	12.7	8.8	5.7	100755.3	45
333	14.3	50.9	3463	277.0	279.8	18.0	10.7	13.2	10.9	5.7	100755.8	45
334	13.7	51.4	3465	277.0	279.8	18.0	10.7	12.6	11.9	5.7	100755.7	45
335	13.8	50.5	3455	277.0	279.8	18.0	10.8	12.8	10.9	5.7	100755.8	45
336	13.4	50.1	3464	277.0	279.8	18.0	10.7	12.4	10.5	5.7	100754.8	45
337	13.5	51.4	3466	277.0	279.8	18.0	10.8	12.5	9.7	5.7	100754.9	45
338	14.2	50.6	3462	277.0	279.8	18.0	10.9	13.1	10.0	5.7	100755.1	46
339	14.4	51.3	3465	277.0	281.9	18.0	10.7	13.3	10.5	5.7	100755.0	47
340	13.9	51.0	3457	277.0	283.7	18.0	10.8	12.8	10.5	5.7	100755.4	47
341	13.4	50.1	3463	277.0	283.7	18.0	10.6	12.4	9.9	5.7	100755.6	47
342	12.4	51.0	3450	277.0	283.7	18.0	10.3	11.5	9.8	5.7	100755.5	47
343	12.1	51.1	3438	277.0	283.7	18.0	10.2	11.2	9.4	5.7	100756.2	47
344	11.9	52.4	3460	277.0	283.7	18.0	10.3	11.0	9.2	5.8	100756.2	45
345	11.3	51.4	3471	277.0	283.7	18.0	10.4	10.4	10.3	5.8	100756.2	45
346			3461	277.0	283.7	18.0	10.5	9.9	9.8	5.8	100756.3	45
347	10.8	50.6	3253	277.0	283.7	18.0	10.3	9.6	8.8	5.8	100755.8	45
348	11.0	49.9	3289	277.0	283.7	18.0	10.3	9.9	7.6	5.8	100755.7	45
349			3342	277.0	281.4	18.0	10.4	10.2	9.3	5.8	100755.2	45
350	11.7	52.3	3452	277.0	278.7	18.0	10.6	10.8	8.9	5.8	100755.3	45
351	13.0	52.1	3464	277.0	279.3	18.0	11.2	12.1	7.9	5.8	100755.3	45
352	12.9	51.5	3458	277.0	282.9	18.0	11.0	11.9	8.8	5.8	100755.6	45

Table E.01 Measurement data - Turbine ON

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-13

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
353	12.4	51.0	3458	277.0	283.7	18.0	11.0	11.5	9.6	5.8	100755.8	45
354	12.7	51.1	3466	277.0	283.7	18.0	11.0	11.7	10.4	5.8	100754.2	45
355	13.2	50.4	3465	277.0	283.7	18.0	10.9	12.2	8.9	5.8	100754.4	45
356	12.7	50.5	3460	277.0	283.7	18.0	10.6	11.7	8.1	5.8	100754.3	45
357	12.0	50.5	3457	277.0	283.7	18.0	10.5	11.0	7.4	5.8	100754.8	45
358	11.7	50.0	3461	277.0	283.7	18.0	10.3	10.8	8.6	5.8	100754.5	45
359			3463	277.0	283.7	18.0	10.6	9.0	9.3	5.8	100755.0	45
360	11.3	50.7	3469	277.0	283.7	18.0	11.0	10.4	8.9	5.8	100755.2	45
361	12.9	51.2	3463	277.0	283.7	18.0	11.2	11.9	8.3	5.9	100755.3	44
362	12.9	50.5	3458	277.0	283.7	18.0	10.9	11.9	8.8	5.9	100755.6	44
363	12.8	50.8	3461	277.0	283.7	18.0	10.7	11.8	8.8	5.9	100755.8	44
364	11.7	51.2	3467	277.0	283.7	18.0	10.8	10.8	9.1	5.9	100755.5	44
365	12.9	51.1	3458	277.0	283.7	18.0	10.8	11.9	10.0	5.9	100755.4	44
366	12.7	52.2	3471	277.0	283.7	18.0	10.8	11.8	11.5	5.9	100755.7	44
367	13.7	50.7	3454	277.0	283.7	18.0	10.8	12.6	12.2	5.9	100755.1	44
368	12.1	51.6	3460	277.0	283.7	18.0	10.6	11.2	10.8	5.8	100754.9	44
369	12.1	51.3	3455	277.0	283.7	18.0	10.4	11.2	9.9	5.8	100754.7	44
370	12.2	51.1	3434	277.0	283.7	18.0	10.3	11.3	10.2	5.8	100754.8	44
371			3485	277.0	283.6	18.0	10.5	10.3	8.8	5.8	100754.9	44
372	11.8	50.8	3463	277.0	280.4	18.0	10.8	10.9	10.3	5.8	100755.1	44
373	12.1	51.8	3471	277.0	278.7	18.0	10.8	11.2	10.9	5.8	100755.6	46
374	12.8	52.0	3461	277.0	278.7	18.0	11.0	11.8	10.0	5.8	100755.7	46
375	13.0	50.9	3458	277.0	279.0	18.0	10.9	12.0	10.3	5.8	100755.8	46
376	12.2	51.5	3450	277.0	282.1	18.0	10.4	11.3	10.0	5.8	100755.8	46
377			3437	277.0	282.8	18.0	10.4	9.9	10.0	5.8	100755.2	46
378			3382	277.0	282.8	18.0	10.4	8.3	9.4	5.8	100754.9	46
379			3366	277.0	282.8	18.0	10.4	8.5	10.0	5.8	100754.7	45
380	11.3	51.1	3463	277.0	282.8	18.0	11.0	10.4	10.3	5.8	100754.8	45
381	12.0	50.9	3465	277.0	282.8	18.0	10.8	11.1	9.4	5.8	100754.5	45
382	12.1	51.4	3461	277.0	282.8	18.0	11.0	11.2	9.8	5.8	100754.5	45
383	12.1	51.1	3467	277.0	282.8	18.0	11.0	11.2	10.0	5.8	100754.6	45
384	12.7	50.8	3457	277.0	282.8	18.0	10.9	11.7	9.9	5.8	100754.7	45
385	12.3	51.6	3465	277.0	282.8	18.0	10.7	11.4	10.1	5.8	100743.3	44
386	12.5	51.4	3467	277.0	282.8	18.0	10.8	11.5	10.6	5.8	100741.1	44
387	12.7	51.1	3462	277.0	282.8	18.0	10.8	11.8	10.4	5.8	100741.1	44
388	13.2	50.6	3457	277.0	282.8	18.0	10.7	12.2	9.0	5.8	100741.4	44
389	12.8	49.9	3464	277.0	282.8	18.0	10.5	11.8	9.0	5.8	100741.5	44
390	12.6	50.2	3463	277.0	282.8	18.0	10.6	11.7	8.5	5.8	100741.5	44
391	12.0	50.3	3462	277.0	282.8	18.0	10.5	11.1	9.4	5.8	100752.7	44
392	12.2	50.2	3466	277.0	282.8	18.0	10.5	11.3	9.4	5.8	100755.0	44
393	11.6	50.8	3445	277.0	282.8	18.0	10.4	10.7	8.7	5.8	100754.9	44
394			3394	277.0	282.8	18.0	10.3	10.1	9.5	5.8	100754.9	44
395			3434	277.0	282.8	18.0	10.4	10.2	8.9	5.8	100755.0	44
396			3453	277.0	282.8	18.0	10.5	10.3	8.9	5.8	100755.1	44
397	11.1	50.1	3304	277.0	282.8	18.0	10.4	10.0	8.2	5.8	100754.9	46
398	10.4	49.8	3143	277.0	282.8	18.0	10.3	9.2	8.9	5.8	100755.0	46
399	10.9	49.4	3281	277.0	282.8	18.0	10.3	10.3	8.2	5.8	100755.0	46
400	10.2	49.6	3107	277.0	282.8	18.0	10.3	9.7	8.8	5.8	100754.8	46
401	9.8	50.1	2958	277.0	282.8	18.0	10.2	8.6	10.2	5.8	100754.8	46
402	9.3	49.9	2729	277.0	282.8	18.0	10.1	8.2	9.9	5.8	100747.9	44
403	9.4	49.7	2786	277.0	282.8	18.0	10.1	9.1	8.4	5.7	100741.6	44
404	8.8	49.2	2489	277.0	282.8	18.0	10.0	8.6	8.3	5.7	100741.4	44
405	8.1	49.0	2118	277.0	282.8	18.0	9.9	8.3	8.0	5.7	100741.5	44
406	8.1	48.9	2073	277.0	282.8	18.0	9.9	7.8	8.6	5.7	100741.7	44
407	8.8	49.5	2495	277.0	282.8	18.0	10.1	7.5	8.6	5.7	100741.5	44
408	9.4	49.5	2805	277.0	282.8	18.0	10.2	8.4	8.8	5.7	100741.7	44
409	9.5	49.4	2823	277.0	282.8	18.0	10.2	9.0	8.3	5.7	100741.3	45
410	9.5	49.5	2849	277.0	282.8	18.0	10.2	8.2	7.4	5.7	100741.2	45
411	8.9	49.2	2575	277.0	282.3	18.0	10.1	8.7	7.3	5.7	100741.2	45
412	8.4	48.7	2267	277.0	278.5	55.1	9.9	8.4	6.8	5.7	100741.4	45
413	8.5	48.8	2344	277.0	276.7	66.0	10.0	8.1	7.4	5.7	100741.2	45
414	8.6	48.8	2403	277.0	276.7	66.0	10.0	8.3	6.7	5.7	100749.7	46
415	8.1	48.1	2098	277.0	276.7	66.0	9.9	7.4	6.3	5.7	100754.6	46
416	7.8	48.0	1917	277.0	276.7	66.0	9.9	7.1	6.0	5.7	100754.6	46
417	7.5	48.3	1728	277.0	276.7	66.0	9.9	7.3	6.2	5.7	100754.5	46
418	7.7	48.3	1832	277.0	276.7	28.8	10.0	7.2	5.9	5.7	100754.5	46
419	8.1	48.5	2069	277.0	276.7	18.0	10.1	7.5	7.2	5.7	100754.6	46
420	8.2	49.5	2164	277.0	276.7	18.0	10.1	7.1	5.8	5.7	100754.4	46
421	8.3	49.3	2190	277.0	276.7	18.0	10.1	8.2	6.3	5.7	100754.4	46
422	9.1	50.4	2678	277.0	276.7	18.0	10.2	10.3	5.8	5.7	100754.5	46
423	8.9	49.4	2579	277.0	276.7	18.0	10.1	8.9	5.3	5.7	100754.6	46
424	8.1	48.5	2113	277.0	276.7	36.8	9.9	8.3	5.8	5.7	100754.6	46
425	10.7	50.6	3213	277.0	276.7	42.0	10.4	9.6	6.7	5.7	100754.6	46
426	12.8	51.1	3478	277.0	276.7	42.0	11.1	11.8	7.6	5.7	100746.6	47
427			3463	277.0	276.7	42.0	10.8	10.0	10.1	5.7	100741.6	47
428			3456	277.0	276.7	42.0	10.7	10.3	8.5	5.7	100741.6	47
429			3458	277.0	276.7	42.0	10.4	9.7	9.4	5.7	100741.6	47
430			3466	277.0	276.7	23.1	10.7	9.6	9.2	5.7	100741.5	47
431	10.6	50.3	3188	277.0	276.7	18.0	10.4	8.4	9.9	5.7	100741.5	47
432			3387	277.0	276.7	18.0	10.5	9.9	10.2	5.8	100741.1	45
433	13.6	51.4	3353	277.0	276.7	18.0	11.2	12.6	9.5	5.8	100741.1	44
434	14.0	50.7	3472	277.0	276.7	18.0	10.7	13.0	10.1	5.8	100742.6	44
435	13.3	50.8	3457	277.0	276.7	18.0	10.7	12.2	10.2	5.8	100744.0	44
436	12.8	51.0	3469	277.0	276.7	18.0	10.7	11.8	9.4	5.8	100743.7	44
437	12.6	50.7	3458	277.0	276.7	18.0	10.6	11.6	10.0	5.8	100743.6	44
438	13.1	50.9	3469	277.0	276.7	18.0	10.7	12.1	9.0	5.8	100743.5	43
439	12.0	50.3	3472	277.0	276.7	18.0	10.6	11.1	9.3	5.8	100743.4	42
440	12.3	50.8	3463	277.0	276.7	18.0	10.8	11.3	7.6	5.8	100743.3	42

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
441	11.6	51.4	3467	277.0	276.7	18.0	10.8	10.7	9.5	5.8	100743.5	42
442	12.5	51.8	3457	277.0	276.7	18.0	11.0	11.6	9.1	5.8	100743.4	42
443	13.3	53.2	3468	277.0	276.7	18.0	10.8	12.3	8.4	5.8	100743.7	44
444	14.1	51.6	3461	277.0	276.7	18.0	10.9	13.0	9.0	5.8	100743.5	46
445	13.4	51.0	3458	277.0	276.7	18.0	10.8	12.3	8.4	5.8	100743.6	46
446	13.1	50.8	3474	277.0	276.7	18.0	10.7	12.1	8.8	5.8	100744.0	46
447	12.8	50.8	3455	277.0	276.7	18.0	10.6	11.8	7.6	5.8	100744.0	46
448	11.9	50.6	3407	277.0	276.7	18.0	10.2	11.0	8.8	5.8	100744.1	46
449	12.3	52.0	3488	277.0	276.9	18.0	10.7	11.4	8.9	5.8	100744.1	46
450	12.5	51.3	3465	277.0	280.0	18.0	10.8	11.5	9.9	5.8	100743.8	46
451	12.2	50.8	3454	277.0	281.7	18.0	10.9	11.3	10.2	5.8	100743.7	46
452	12.5	51.2	3478	277.0	281.7	18.0	10.9	11.5	10.1	5.8	100743.9	46
453	14.4	52.2	3459	277.0	281.7	18.0	11.0	13.3	11.8	5.8	100744.1	46
454	14.5	52.7	3462	277.0	281.7	18.0	10.9	13.4	11.3	5.8	100744.3	46
455	14.2	51.0	3459	277.0	281.7	18.0	10.6	13.1	9.8	5.9	100744.3	44
456	13.4	50.9	3443	277.0	281.7	18.0	10.4	12.4	10.9	5.9	100744.2	43
457	13.0	50.7	3479	277.0	281.7	18.0	10.5	12.0	10.4	5.9	100744.2	43
458	12.6	51.8	3473	277.0	281.7	18.0	10.8	11.7	8.1	5.9	100744.4	43
459	13.6	51.7	3462	277.0	281.7	18.0	10.9	12.5	7.6	5.9	100744.4	43
460	12.7	50.8	3460	277.0	281.7	18.0	10.6	11.7	8.8	5.9	100744.2	43
461	12.9	51.0	3469	277.0	281.7	18.0	10.8	11.9	8.9	5.9	100752.7	45
462	13.6	51.0	3459	277.0	282.6	18.0	11.1	12.6	7.7	5.9	100757.5	46
463	14.2	50.8	3459	277.0	285.6	18.0	11.0	13.1	7.3	5.9	100757.5	46
464	14.3	51.0	3463	277.0	285.8	18.0	10.9	13.2	11.0	5.9	100757.7	46
465	14.9	51.8	3461	277.0	285.8	18.0	10.7	13.8	11.2	5.9	100757.6	46
466	14.8	51.2	3464	277.0	285.8	18.0	10.7	13.7	10.3	5.9	100757.6	46
467	14.5	52.3	3456	277.0	285.8	18.0	10.6	13.4	9.8	5.9	100749.3	45
468	13.6	52.0	3435	277.0	285.8	18.0	10.4	12.6	10.0	5.9	100744.3	44
469	13.7	54.1	3489	277.0	285.8	18.0	10.6	12.7	9.6	5.9	100744.4	44
470	14.2	51.3	3464	277.0	285.8	18.0	10.9	13.1	9.9	5.9	100744.5	44
471	14.8	51.7	3464	277.0	285.8	18.0	10.8	13.7	9.4	5.9	100744.3	44
472	14.6	51.6	3460	277.0	285.8	18.0	10.7	13.5	12.1	5.9	100744.3	44
473	14.3	51.2	3467	277.0	285.8	18.0	10.7	13.2	11.3	5.9	100737.8	43
474	14.1	51.4	3459	277.0	285.8	18.0	10.6	13.1	11.9	5.9	100731.9	43
475	14.7	52.4	3466	277.0	285.8	18.0	10.7	13.6	12.3	5.9	100731.8	43
476	14.9	52.7	3457	277.0	285.8	18.0	10.6	13.8	12.5	5.9	100731.6	43
477	14.4	53.2	3458	277.0	285.8	18.0	10.5	13.3	12.8	5.9	100731.6	43
478	13.1	53.8	3449	277.0	285.8	18.0	10.4	12.1	12.1	5.9	100731.7	43
479	13.3	52.5	3464	277.0	285.8	18.0	10.5	12.3	11.6	5.9	100744.1	43
480	12.9	51.4	3464	277.0	285.8	18.0	10.5	12.0	10.4	5.9	100744.2	43
481	12.5	51.5	3479	277.0	285.8	18.0	10.6	11.5	8.9	5.9	100744.2	43
482	12.3	51.7	3471	277.0	285.8	18.0	10.7	11.4	9.0	5.9	100744.3	43
483	12.0	52.1	3460	277.0	285.5	18.0	10.8	11.1	9.3	5.9	100744.0	43
484	13.2	52.2	3470	277.0	282.3	18.0	11.1	12.2	9.4	5.9	100744.2	43
485	13.6	51.8	3459	277.0	281.7	18.0	10.9	12.6	8.8	5.9	100744.3	45
486	14.1	51.8	3459	277.0	281.7	18.0	10.8	13.0	8.1	5.9	100744.0	46
487	13.4	51.9	3463	277.0	281.7	18.0	10.6	12.4	10.7	5.9	100744.1	46
488	14.3	51.2	3464	277.0	281.7	18.0	10.9	13.2	8.9	5.9	100744.1	46
489	13.6	51.8	3461	277.0	281.7	18.0	10.7	12.6	9.4	5.9	100744.3	46
490	13.2	51.0	3452	277.0	281.7	18.0	10.5	12.2	10.0	5.9	100744.1	46
491	13.6	51.5	3481	277.0	281.7	18.0	10.8	12.6	12.3	5.9	100733.1	43
492	14.5	51.2	3468	277.0	281.7	18.0	10.8	13.4	11.7	5.9	100732.0	43
493	14.7	51.6	3466	277.0	281.7	18.0	10.9	13.6	9.7	5.9	100731.5	43
494	13.7	51.5	3457	277.0	281.7	18.0	10.6	12.6	10.6	5.9	100731.7	43
495	11.6	51.2	3449	277.0	281.7	18.0	10.4	10.8	8.3	5.9	100731.5	43
496	13.4	51.1	3483	277.0	281.7	18.0	10.7	12.4	8.7	5.9	100731.0	43
497	13.5	50.4	3454	277.0	281.7	18.0	10.7	12.5	7.8	5.9	100754.5	48
498	13.4	50.5	3453	277.0	281.7	18.0	10.5	12.4	8.4	5.9	100756.7	49
499	13.3	51.1	3476	277.0	281.7	18.0	10.6	12.3	9.6	5.9	100757.4	49
500	13.7	51.2	3460	277.0	281.7	18.0	10.6	12.6	8.6	5.9	100757.7	49
501	13.3	51.2	3449	277.0	281.7	18.0	10.5	12.3	8.3	5.9	100757.0	49
502	13.0	51.5	3477	277.0	281.7	18.0	10.7	12.0	8.8	5.9	100757.1	49
503	13.2	52.1	3462	277.0	281.7	18.0	10.7	12.2	9.8	5.9	100746.1	49
504	12.4	52.2	3474	277.0	281.7	18.0	10.8	11.5	8.5	5.9	100743.6	49
505	13.3	51.5	3454	277.0	281.7	18.0	11.0	12.3	9.1	5.9	100743.3	49
506	13.1	53.1	3464	277.0	281.7	18.0	10.7	12.1	9.1	5.9	100743.8	49
507	14.1	51.1	3462	277.0	281.7	18.0	10.9	13.0	8.9	5.9	100743.9	49
508	14.1	51.1	3461	277.0	281.7	18.0	10.6	13.1	10.4	5.9	100744.4	49
509	14.1	51.9	3466	277.0	281.7	18.0	10.6	13.0	8.8	6.0	100744.0	46
510	12.8	51.2	3449	277.0	281.7	18.0	10.5	11.9	7.5	6.0	100743.9	45
511	12.9	51.4	3474	277.0	281.7	18.0	10.6	11.9	8.1	6.0	100744.0	45
512	13.3	51.7	3447	277.0	281.7	18.0	10.5	12.3	6.9	6.0	100744.1	45
513	11.9	50.5	3405	277.0	281.7	18.0	10.3	11.0	8.6	6.0	100744.2	45
514	11.4	50.6	3358	277.0	281.7	18.0	10.1	10.6	9.3	6.0	100744.7	45
515			3466	277.0	281.7	18.0	10.5	10.2	9.8	6.0	100758.0	45
516	12.8	51.6	3482	277.0	281.7	18.0	11.0	11.8	9.4	6.0	100758.1	45
517	13.2	51.2	3458	277.0	282.7	18.0	10.9	12.2	8.8	6.0	100758.3	45
518	12.4	50.5	3454	277.0	286.7	18.0	10.8	11.5	8.0	6.0	100758.3	45
519	11.5	50.2	3445	277.0	287.8	18.0	10.5	10.6	8.0	6.0	100758.3	45
520			3423	277.0	287.8	18.0	10.5	10.2	7.8	6.0	100758.2	46
521	11.1	50.2	3304	277.0	287.8	18.0	10.3	9.2	8.2	6.0	100758.2	47
522	10.5	49.9	3175	277.0	287.8	18.0	10.3	9.0	8.2	6.0	100758.2	47
523	10.2	50.2	3095	277.0	287.8	18.0	10.3	9.9	8.7	6.0	100758.3	47
524	9.9	49.7	3004	277.0	287.8	18.0	10.2	9.2	9.0	6.0	100758.2	47
525	9.9	50.1	3016	277.0	287.8	18.0	10.2	9.7	9.9	6.0	100758.4	47
526	9.9	49.9	3017	277.0	287.8	18.0	10.2	8.9	9.9	6.0	100758.3	45
527	9.9	49.5	3003	277.0	287.8	18.0	10.2	9.3	10.0	6.0	100758.2	44
528	9.4	49.5	2808	277.0	287.8	18.0	10.2	7.8	9.4	6.0	100758.5	44

Table E.01 Measurement data - Turbine ON

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-13

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
529	9.7	49.9	2915	277.0	287.8	18.0	10.2	9.1	10.5	6.0	100758.4	44
530	9.7	49.6	2934	277.0	287.8	18.0	10.2	9.8	9.5	6.0	100757.7	44
531	9.5	50.0	2823	277.0	287.8	18.0	10.2	10.7	9.3	6.0	100757.7	44
532	9.0	49.7	2630	277.0	287.8	18.0	10.1	9.3	9.1	6.0	100757.3	43
533	8.8	49.5	2506	277.0	287.8	18.0	10.0	9.4	8.6	5.9	100757.3	42
534	8.8	49.5	2494	277.0	287.8	18.0	10.0	9.9	9.4	5.9	100757.4	42
535	9.4	49.6	2802	277.0	287.8	18.0	10.1	9.7	9.0	5.9	100757.6	42
536	9.6	49.7	2856	277.0	287.8	18.0	10.2	8.8	8.4	5.9	100758.3	42
537	8.4	49.7	2242	277.0	287.8	18.0	10.1	7.0	8.6	5.9	100758.2	42
538			296	277.0	287.8	18.0	10.9	5.8	8.7	5.9	100758.4	43
539			5	277.0	287.8	18.0	8.8	5.6	9.2	5.9	100758.2	43
540			1	277.0	287.8	18.0	8.1	6.6	9.5	5.9	100758.3	43
541			1	277.0	287.8	18.0	8.1	7.4	8.7	5.9	100758.3	43
542			1	277.0	287.8	40.9	7.7	6.8	9.1	5.9	100758.2	43
543			1	277.0	287.8	42.0	7.3	6.4	8.4	5.9	100758.3	43
544			1	277.0	287.8	42.0	7.8	9.4	7.2	5.9	100758.1	45
545			1	277.0	287.8	42.0	7.8	11.0	7.2	5.9	100758.0	46
546			1	277.0	287.8	42.0	7.4	10.9	7.4	5.9	100758.3	46
547			1	277.0	287.8	42.0	7.0	10.1	6.3	5.9	100758.4	46
548			1	277.0	287.8	19.0	6.3	7.4	7.2	5.9	100758.2	46
549			1	277.0	287.8	18.0	6.9	8.0	7.1	5.9	100758.2	46
550			1	277.0	287.7	18.0	7.0	10.9	8.3	5.9	100758.6	47
551			1	277.0	285.3	18.0	6.6	9.7	7.7	5.9	100758.6	47
552			1	277.0	284.7	18.0	6.8	9.8	7.5	5.9	100758.6	47
553			1	277.0	284.7	18.0	6.9	10.0	11.3	5.9	100758.7	47
554			1	277.0	284.7	18.0	6.5	8.7	12.1	5.9	100758.4	47
555			1	277.0	284.7	18.0	6.4	10.2	12.0	5.9	100758.6	47
556			1	277.0	284.7	18.0	6.4	10.6	9.3	5.9	100758.7	44
557			1	277.0	284.7	18.0	6.3	9.8	8.8	5.9	100758.6	43
558			1	277.0	284.7	18.0	6.4	9.8	8.3	5.9	100758.3	43
559			1	277.0	284.4	18.0	6.8	10.4	8.6	5.9	100758.0	43
560			2	277.0	281.9	18.0	6.7	9.4	10.1	5.9	100757.7	43
561			2	277.0	281.7	18.0	6.6	8.7	11.2	5.9	100757.3	43
562			2	277.0	281.7	18.0	7.0	11.6	9.8	5.9	100757.6	43
563			2	277.0	281.7	18.0	6.9	12.0	10.4	5.9	100757.5	43
564			2	277.0	280.2	18.0	6.7	12.3	10.2	5.9	100757.6	43
565			388	277.0	276.3	18.0	6.3	12.1	9.7	5.9	100757.7	43
566			516	277.0	275.8	18.0	6.8	12.2	11.7	5.9	100757.9	43

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
617												
618												
619												
620												
621												
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Table E.02 Measurement data - Background

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-13

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
1	8.9	40.5	0.0	7.5	5	100725.6	44
2	9.2	42.1	0.0	7.7	5	100725.4	44
3	10.5	43.1	0.1	8.8	5	100724.9	44
4	9.4	43.9	0.0	7.9	5	100718.3	45
5	9.0	40.6	0.0	7.5	5	100711.9	45
6			0.0	7.9	5	100711.6	45
7			0.0	8.0	5	100711.0	45
8			0.0	7.5	5	100710.4	45
9			0.0	6.4	5	100710.5	45
10			0.0	6.3	5	100718.0	47
11	7.8	41.2	0.0	6.6	5	100726.6	50
12	9.1	40.8	0.0	7.6	5	100726.8	50
13	9.0	40.0	0.0	7.6	5	100726.8	50
14	10.6	40.6	0.0	8.9	5	100726.6	50
15	11.6	39.4	0.0	9.8	5	100727.0	50
16	10.6	38.6	0.0	8.9	5	100726.9	47
17	10.8	40.3	0.0	9.1	5	100726.8	45
18	11.1	38.9	0.0	9.4	5	100727.0	45
19	11.4	37.1	0.0	9.6	5	100727.3	45
20	9.0	37.8	0.0	7.6	5	100726.7	45
21	10.6	39.0	0.0	8.9	5	100726.4	45
22	10.1	38.7	0.0	8.5	5	100725.3	46
23	11.7	41.0	0.0	9.9	5	100724.4	47
24	12.7	43.3	0.0	10.7	5	100724.0	47
25	12.1	42.8	0.2	10.2	5	100723.7	47
26	10.7	44.2	0.0	9.0	5	100723.9	47
27	8.5	41.5	0.0	7.2	5	100723.9	47
28	8.4	42.4	0.0	7.0	5	100723.8	48
29	9.1	42.7	0.0	7.6	5	100723.7	50
30	9.3	39.5	0.0	7.8	5	100723.4	50
31	9.8	39.3	0.0	8.3	5	100723.3	50
32	10.6	40.7	0.0	8.9	5	100723.8	50
33	10.0	43.9	0.0	8.4	5	100724.7	50
34	9.4	43.0	0.0	8.0	5	100725.4	50
35	9.9	41.7	0.0	8.3	5	100725.6	49
36	11.6	42.6	0.0	9.8	5	100724.2	49
37	10.3	41.9	0.0	8.7	5	100722.9	49
38	9.2	41.9	0.0	7.7	5	100723.1	49
39	8.2	41.0	0.0	6.9	5	100723.2	49
40	7.6	39.8	0.0	6.4	5	100723.9	50
41	6.7	38.3	0.0	5.7	5	100724.7	50
42	8.6	39.6	0.0	7.3	5	100724.8	50
43	8.1	41.9	0.0	6.9	5	100724.8	50
44	10.0	41.0	0.0	8.4	5	100724.6	50
45	9.3	43.1	0.0	7.8	5	100724.0	50
46	8.6	43.9	0.0	7.2	5	100724.4	49
47	8.0	40.2	0.0	6.8	5	100725.6	48
48	7.8	38.8	0.0	6.6	5	100725.9	48
49	8.0	39.5	0.0	6.7	5	100726.0	48
50	9.9	40.4	0.0	8.4	5	100725.8	48
51	10.2	42.9	0.0	8.6	5	100726.4	48
52	10.1	39.8	0.0	8.5	5	100726.4	46
53	9.0	40.3	0.0	7.6	5	100726.3	45
54	9.0	38.5	0.0	7.5	5	100726.1	45
55	7.9	35.9	0.0	6.6	5	100725.9	45
56	8.5	38.0	0.0	7.2	5	100725.0	45
57	7.5	39.4	0.0	6.3	5	100724.9	45
58	7.7	37.2	0.0	6.5	5	100724.8	47
59	8.1	36.2	0.0	6.8	5	100724.9	49
60	9.3	36.7	0.0	7.9	5	100726.1	49
61	8.6	37.7	0.0	7.2	5	100725.9	49
62	9.2	39.5	0.0	7.8	5	100725.9	49
63			0.1	8.6	5	100725.8	49
64			0.0	8.8	5	100725.6	49
65			0.0	8.5	5	100725.6	49
66			0.0	10.0	5	100725.1	49
67			0.0	9.5	5	100724.9	49
68			0.0	9.2	5	100726.1	49
69			0.0	9.4	5	100726.2	49
70			0.0	7.2	5	100726.1	49
71			0.0	7.9	5	100726.2	48
72			0.0	8.8	5	100726.3	48
73			0.0	9.8	5	100726.3	48
74			0.0	8.6	5	100726.3	48
75			0.0	8.4	5	100726.3	48
76			0.2	7.7	5	100726.4	49
77			0.1	8.6	5	100726.6	50
78			0.0	9.5	5	100726.9	50
79			0.0	8.3	5	100726.8	50
80			0.0	6.9	5	100726.9	50
81			0.1	7.3	5	100727.0	50
82			0.1	7.5	5	100727.2	51
83			0.0	8.1	5	100727.3	52

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
84			0.0	8.6	5	100727.6	52
85	11.9	42.0	0.0	10.0	5	100727.8	52
86	11.6	42.1	0.0	9.8	5	100727.7	52
87	9.8	43.4	0.0	8.3	5	100727.6	52
88	9.0	42.3	0.0	7.6	5	100727.5	50
89	10.5	42.9	0.0	8.8	5	100727.5	48
90			0.0	7.6	5	100727.6	48
91			0.0	8.8	5	100727.9	48
92			0.0	8.7	5	100728.0	48
93			0.0	8.4	5	100728.2	48
94			0.0	8.1	5	100728.3	46
95			0.0	7.7	5	100728.1	45
96			0.0	7.5	5	100728.0	45
97			0.0	7.5	5	100727.8	45
98			0.0	7.8	5	100727.6	45
99			0.0	7.7	5	100727.3	45
100	10.1	41.1	0.0	8.5	5	100727.4	47
101	10.4	44.6	0.0	8.8	5	100726.7	50
102	10.3	41.3	0.0	8.7	5	100727.9	50
103	10.3	40.2	0.0	8.7	5	100727.5	50
104	10.3	41.9	0.0	8.7	5	100726.8	50
105	9.9	42.5	0.0	8.3	5	100727.7	50
106	10.3	40.4	0.0	8.7	5	100727.6	49
107	10.4	40.4	0.0	8.8	5	100727.5	48
108	10.5	40.2	0.0	8.9	5	100727.5	48
109	9.7	46.8	0.0	8.1	5	100727.5	48
110	9.3	47.5	0.0	7.9	5	100727.2	48
111	9.0	45.2	0.0	7.6	5	100727.1	48
112	10.2	41.5	0.0	8.6	5	100727.1	48
113	8.6	41.9	0.1	7.2	5	100726.2	48
114	7.9	43.8	0.1	6.6	5	100725.9	48
115	7.4	41.4	0.0	6.3	5	100726.2	48
116	7.4	40.0	0.0	6.3	5	100726.3	48
117	6.6	39.9	0.0	5.6	5	100726.0	48
118	10.5	41.5	0.0	8.8	5	100719.9	51
119	11.2	41.1	0.0	9.4	5	100713.0	54
120	9.4	41.4	0.0	7.9	5	100712.7	54
121	9.0	39.2	0.0	7.6	5	100712.9	54
122	8.7	38.6	0.1	7.3	5	100712.9	54
123	10.6	40.2	0.1	8.9	5	100714.0	54
124	11.3	44.4	0.0	9.5	5	100713.9	51
125	10.8	41.3	0.0	9.1	5	100713.2	48
126	9.8	43.5	0.0	8.2	5	100712.6	48
127	8.9	41.4	0.2	7.5	5	100712.1	48
128	7.9	42.4	0.0	6.7	5	100711.8	48
129	7.8	41.9	0.0	6.6	5	100712.2	48
130	8.5	40.4	0.0	7.1	5	100712.6	49
131	8.9	42.1	0.0	7.5	5	100712.5	49
132	9.0	41.7	0.0	7.6	5	100712.9	49
133	9.1	41.4	0.0	7.7	5	100712.3	49
134	8.9	39.5	0.1	7.5	5	100711.6	49
135	10.4	42.7	0.1	8.8	5	100711.6	49
136	10.3	41.5	0.0	8.7	5	100711.3	49
137	9.8	39.3	0.0	8.3	5	100711.4	49
138	8.2	38.2	0.2	6.9	5	100711.1	49
139	8.5	38.7	0.0	7.2	5	100711.1	49
140	8.6	36.8	0.0	7.2	5	100711.3	49
141	9.6	37.7	0.0	8.1	5	100711.6	49
142	9.9	43.3	0.0	8.3	5	100719.6	49
143	9.7	40.1	0.0	8.2	5	100724.7	48
144	9.9	37.4	0.0	8.3	5	100724.5	48
145	9.7	40.6	0.0	8.2	5	100724.5	48
146	10.4	42.8	0.0	8.8	5	100724.7	48
147	10.0	40.6	0.0	8.4	5	100725.0	48
148	10.9	38.8	0.0	9.2	5	100725.8	48
149	11.4	37.7	0.0	9.6	5	100726.3	47
150	10.6	38.3	0.0	8.9	5	100726.6	47
151	10.4	38.6	0.0	8.7	5	100726.3	47
152	9.0	42.8	0.0	7.6	5	100726.6	47
153	8.3	44.8	0.0	7.0	5	100726.8	47
154	9.8	42.0	0.0	8.3	5	100726.3	49
155	9.4	40.5	0.0	8.0	6	100726.2	52
156	9.4	43.6	0.0	7.9	6	100726.4	52
157	9.7	42.8	0.0	8.1	6	100725.9	52
158	9.8	43.3	0.0	8.3	6	100726.0	52
159	10.6	41.0	0.0	8.9	6	100726.1	52
160	10.6	41.5	0.0	8.9	6	100725.9	50
161	11.2	40.1	0.0	9.4	6	100726.2	48
162	10.6	39.6	0.0	8.9	6	100726.7	48
163	10.5	37.3	0.0	8.8	6	100726.2	48
164	9.8	36.4	0.0	8.3	6	100726.3	48
165	8.2	37.9	0.0	6.9	6	100727.1	48
166	7.8	38.6	0.0	6.6	6	100726.4	48

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
167	7.9	39.0	0.0	6.6	6	100726.4	49
168	7.7	41.3	0.0	6.5	6	100726.0	49
169	7.7	42.3	0.0	6.5	6	100725.9	49
170	9.8	38.5	0.0	8.3	6	100726.2	49
171	9.9	40.4	0.0	8.3	6	100725.9	49
172	9.3	40.2	0.0	7.9	6	100726.2	48
173			0.0	6.5	6	100726.4	47
174			0.0	7.2	6	100726.3	47
175			0.0	7.2	6	100725.9	47
176			0.2	5.9	6	100726.1	47
177			0.0	6.4	6	100726.1	47
178			0.0	7.6	6	100721.3	49
179			0.0	9.2	6	100713.8	51
180	9.9	42.6	0.0	8.3	6	100714.1	51
181	9.3	40.7	0.0	7.8	6	100713.3	51
182	10.1	39.3	0.0	8.5	6	100713.0	51
183	9.4	39.8	0.0	7.9	6	100713.1	51
184	9.2	42.6	0.0	7.7	6	100720.7	50
185	9.9	46.5	0.0	8.3	6	100726.4	50
186	9.4	43.5	0.2	7.9	6	100726.5	50
187	9.0	44.9	0.0	7.6	6	100726.6	50
188	10.8	40.0	0.0	9.1	6	100726.8	50
189	11.8	39.6	0.0	9.9	6	100726.9	50
190	10.2	39.0	0.0	8.6	6	100725.7	50
191	10.7	39.5	0.0	9.0	6	100726.1	49
192	9.1	41.1	0.0	7.6	6	100726.5	49
193	9.7	39.5	0.0	8.1	6	100726.2	49
194	10.6	39.5	0.0	8.9	6	100726.0	49
195	10.6	40.8	0.0	8.9	6	100726.1	49
196	11.2	40.1	0.0	9.4	6	100719.4	49
197	12.3	39.2	0.0	10.3	6	100712.2	49
198	12.1	44.9	0.0	10.2	6	100712.8	49
199	10.5	46.7	0.0	8.8	6	100712.7	49
200	10.6	44.6	0.0	9.0	6	100712.3	49
201	11.3	44.1	0.0	9.5	6	100712.4	49
202	12.9	42.9	0.0	10.8	6	100712.6	48
203	11.4	45.6	0.0	9.6	6	100712.5	46
204	9.8	45.2	0.0	8.3	6	100712.5	46
205	11.9	45.8	0.0	10.0	6	100712.2	46
206			0.0	9.8	6	100712.4	46
207			0.0	9.5	6	100712.6	46
208			0.0	9.7	6	100712.6	46
209			0.0	10.4	6	100712.6	46
210			0.0	9.6	6	100712.5	46
211			0.0	8.9	6	100712.6	46
212	10.9	44.6	0.0	9.2	6	100713.0	46
213	10.7	44.3	0.0	9.0	6	100712.5	46
214	9.7	44.2	0.0	8.2	6	100718.9	48
215	9.6	42.7	0.0	8.1	6	100725.7	49
216	11.2	40.4	0.0	9.4	6	100725.7	49
217	10.5	44.3	0.0	8.8	6	100725.7	49
218	9.8	39.7	0.1	8.2	6	100725.8	49
219	11.6	39.5	0.2	9.8	6	100725.9	49
220	11.7	41.8	0.2	9.8	6	100725.6	47
221	11.4	42.2	0.1	9.6	6	100725.9	45
222	10.2	41.2	0.0	8.6	6	100725.9	45
223	9.5	39.7	0.0	8.0	6	100725.8	45
224	10.5	39.1	0.0	8.9	6	100725.9	45
225	11.3	40.3	0.0	9.5	6	100725.9	45
226	11.2	39.2	0.1	9.5	6	100725.8	45
227	10.4	41.7	0.1	8.8	6	100725.8	46
228	9.1	43.0	0.1	7.7	6	100725.9	46
229	8.6	40.3	0.1	7.2	6	100725.8	46
230	9.4	38.2	0.0	7.9	6	100725.8	46
231	9.9	39.4	0.0	8.3	6	100725.8	46
232	10.6	41.9	0.0	8.9	6	100726.0	46
233			0.0	7.9	6	100726.0	46
234			0.0	8.2	6	100726.1	46
235			0.0	7.3	6	100726.1	46
236			0.0	7.3	6	100726.0	46
237	8.3	40.5	0.0	7.0	6	100726.2	46
238	8.8	38.8	0.0	7.4	6	100726.2	47
239	7.6	39.1	0.0	6.4	6	100726.2	48
240	10.1	39.7	0.0	8.5	6	100726.0	48
241	10.1	40.6	0.0	8.5	6	100725.8	48
242	8.8	41.5	0.0	7.4	6	100726.8	48
243	10.2	43.8	0.0	8.6	6	100726.9	48
244	9.4	38.8	0.0	7.9	6	100726.8	50
245	9.2	39.3	0.0	7.8	6	100726.4	52
246	9.0	42.9	0.0	7.5	6	100726.1	52
247	10.0	42.4	0.0	8.4	6	100726.4	52
248	11.8	42.3	0.0	9.9	6	100726.2	52
249	10.9	41.0	0.0	9.2	6	100726.2	52

Table E.02 Measurement data - Background

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-13

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
250	12.3	39.8	0.0	10.3	6	100719.6	49
251	12.2	41.8	0.0	10.3	6	100712.7	45
252	10.5	43.8	0.0	8.8	6	100712.9	45
253	10.4	43.4	0.0	8.7	6	100713.3	45
254	9.9	42.8	0.1	8.3	6	100713.4	45
255	11.3	40.0	0.1	9.5	6	100713.2	45
256	10.5	39.9	0.0	8.9	6	100719.5	45
257	9.6	40.9	0.0	8.1	6	100726.7	45
258	10.5	40.2	0.0	8.8	6	100726.9	45
259	11.7	42.4	0.0	9.9	6	100727.2	45
260	11.1	41.7	0.0	9.3	6	100727.0	45
261	10.0	43.1	0.0	8.4	6	100726.6	45
262	8.8	43.7	0.0	7.4	6	100726.5	46
263	12.9	41.2	0.0	10.9	6	100759.2	47
264	13.7	44.5	0.0	11.5	6	100758.9	47
265	12.9	43.3	0.0	10.8	6	100759.0	47
266	11.5	41.9	0.0	9.7	6	100759.0	47
267	12.1	42.2	0.0	10.2	6	100757.9	46
268	11.2	40.2	0.0	9.5	6	100758.0	44
269	10.5	40.7	0.0	8.8	6	100758.8	44
270	9.1	41.1	0.0	7.7	6	100758.8	44
271	12.9	39.7	0.0	10.8	6	100758.9	44
272	11.7	39.8	0.0	9.8	6	100758.1	44
273	10.8	39.1	0.0	9.1	6	100756.8	44
274	10.1	41.2	0.0	8.5	6	100758.3	44
275	10.8	41.4	0.0	9.1	6	100756.8	44
276	13.1	45.5	0.0	11.0	6	100758.1	44
277	12.3	43.4	0.2	10.4	6	100758.2	44
278	11.8	40.2	0.0	9.9	6	100756.7	44
279	11.7	40.3	0.0	9.9	6	100757.8	44
280	11.2	43.3	0.0	9.4	6	100758.4	43
281	10.1	40.8	0.0	8.5	6	100758.4	43
282	8.7	39.0	0.1	7.3	6	100758.3	43
283	8.0	40.1	0.3	6.7	6	100756.9	43
284	7.2	41.5	0.3	6.1	6	100757.2	43
285	9.2	41.2	0.1	7.7	6	100763.7	44
286	9.6	39.8	0.0	8.1	6	100771.2	46
287	8.8	38.9	0.0	7.4	6	100771.3	46
288	7.6	39.0	0.1	6.4	6	100770.0	46
289	7.0	39.6	0.2	5.9	6	100770.3	46
290	7.7	38.6	0.2	6.5	6	100771.3	46
291	6.7	41.1	0.1	5.6	6	100771.1	46
292	6.7	42.5	0.0	5.7	6	100771.2	47
293	8.3	41.4	0.0	7.0	6	100770.8	47
294	9.6	39.8	0.0	8.1	6	100770.3	47
295	9.1	41.1	0.0	7.7	6	100771.2	47
296	8.7	39.4	0.0	7.3	6	100771.4	47
297	9.5	37.8	0.0	8.0	6	100771.4	45
298	8.6	39.3	0.0	7.2	6	100771.4	43
299	8.6	41.0	0.0	7.3	6	100770.9	43
300	7.9	41.1	0.0	6.6	6	100771.1	43
301	8.9	42.1	0.0	7.5	6	100771.4	43
302	8.3	37.5	0.0	7.0	6	100771.2	43
303	9.0	38.0	0.0	7.6	6	100771.4	44
304	10.4	37.6	0.0	8.8	6	100771.1	44
305	9.7	39.8	0.0	8.2	6	100771.3	44
306	9.7	39.1	0.0	8.1	6	100771.7	44
307	8.8	37.5	0.0	7.4	6	100771.5	44
308	8.6	37.1	0.2	7.3	6	100771.6	44
309	9.7	40.8	0.0	8.1	6	100778.6	45
310	10.2	43.0	0.0	8.6	6	100784.2	46
311	9.8	44.3	0.0	8.2	6	100785.0	46
312	9.9	41.4	0.0	8.3	6	100784.7	46
313	9.7	45.6	0.0	8.2	6	100785.1	46
314	8.8	41.7	0.0	7.4	6	100785.2	46
315	8.5	42.6	0.0	7.2	6	100785.5	45
316	8.3	38.0	0.1	7.0	6	100785.5	43
317	7.2	38.1	0.1	6.0	6	100785.8	43
318	8.6	36.9	0.0	7.2	6	100786.0	43
319	8.2	38.1	0.0	6.9	6	100785.6	43
320	7.7	39.6	0.0	6.4	6	100785.6	43
321	9.2	37.8	0.0	7.7	6	100785.5	44
322	9.2	39.0	0.0	7.7	6	100785.7	45
323	9.2	40.1	0.0	7.7	6	100785.4	45
324	8.4	40.4	0.0	7.1	6	100785.6	45
325	10.9	39.2	0.0	9.2	6	100785.6	45
326	9.6	40.2	0.1	8.1	6	100785.6	45
327	10.5	41.7	0.1	8.9	6	100785.1	45
328	9.7	42.2	0.0	8.2	6	100785.5	45
329	8.9	41.6	0.0	7.5	6	100785.5	45
330	8.8	41.8	0.0	7.4	6	100785.4	45
331	9.1	40.8	0.0	7.6	6	100785.5	45
332	9.5	39.9	0.0	8.0	6	100785.0	45

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
333	9.6	39.3	0.0	8.1	6	100785.1	45
334	9.2	41.6	0.0	7.8	6	100785.6	45
335	9.6	42.4	0.0	8.1	6	100785.8	45
336	11.0	39.8	0.0	9.3	6	100785.8	45
337	10.7	42.2	0.0	9.0	6	100785.6	45
338	10.3	43.1	0.0	8.7	6	100784.7	45
339	10.5	43.7	0.0	8.9	5	100785.3	45
340	9.8	43.4	0.0	8.3	5	100785.6	45
341	10.5	42.3	0.0	8.8	5	100785.7	45
342	9.7	42.5	0.0	8.1	5	100785.6	45
343	9.2	40.9	0.0	7.8	5	100785.4	45
344	8.5	42.5	0.0	7.2	5	100785.3	45
345	6.6	40.5	0.0	5.6	5	100785.4	45
346	7.1	41.3	0.1	6.0	5	100785.4	46
347	8.4	39.4	0.0	7.1	5	100785.3	46
348	9.6	40.0	0.0	8.1	5	100785.3	46
349	9.9	39.8	0.0	8.3	5	100785.2	46
350	8.9	40.1	0.0	7.5	5	100785.3	46
351	7.9	41.8	0.0	6.7	5	100785.3	45
352	7.6	40.8	0.0	6.4	5	100785.3	44
353	8.9	39.7	0.0	7.5	5	100785.4	44
354	8.4	40.0	0.0	7.1	5	100785.2	44
355	8.4	39.3	0.0	7.1	5	100785.3	44
356	8.1	38.2	0.0	6.8	5	100785.3	44
357	7.4	39.2	0.0	6.3	5	100785.3	45
358	7.4	38.9	0.0	6.2	5	100785.4	46
359	7.3	38.8	0.0	6.2	5	100785.4	46
360	6.1	38.4	0.0	5.2	5	100785.2	46
361	5.7	38.1	0.0	4.8	5	100785.3	46
362	5.9	37.2	0.0	5.0	5	100785.4	46
363	6.4	35.8	0.0	5.4	5	100785.3	47
364	6.2	35.9	0.0	5.2	5	100785.3	48
365	5.8	34.1	0.0	4.9	5	100785.6	48
366	6.1	34.4	0.0	5.2	5	100785.6	48
367	5.6	34.2	0.0	4.7	5	100785.4	48
368	6.3	34.0	0.0	5.3	5	100785.3	48
369	6.8	32.8	0.0	5.7	5	100785.2	47
370	6.4	33.6	0.0	5.4	5	100785.3	47
371	6.6	33.4	0.0	5.5	5	100785.2	47
372	7.1	34.2	0.0	5.9	5	100785.2	47
373	6.4	35.4	0.0	5.4	5	100785.1	47
374	6.2	36.8	0.0	5.2	5	100785.2	47
375	5.9	40.3	0.0	4.9	5	100785.2	48
376	6.0	39.2	0.0	5.1	5	100785.1	50
377	5.6	37.2	0.0	4.8	5	100784.8	50
378	5.1	37.8	0.0	4.3	5	100785.1	50
379	5.1	36.7	0.2	4.3	5	100784.9	50
380	5.4	35.8	0.0	4.5	5	100785.0	50
381	6.6	35.6	0.0	5.6	5	100785.1	50
382	6.6	33.8	0.0	5.5	5	100784.8	50
383	5.9	35.0	0.0	4.9	5	100783.9	50
384	6.1	36.9	0.0	5.1	5	100785.4	50
385	7.6	36.4	0.0	6.4	5	100785.4	50
386	6.7	35.9	0.0	5.7	5	100785.2	50
387	6.3	35.3	0.2	5.3	5	100785.3	49
388	6.3	33.8	0.0	5.3	5	100784.3	47
389	6.3	34.1	0.0	5.3	5	100784.9	47
390	6.5	35.3	0.0	5.5	5	100785.4	47
391	5.6	34.8	0.0	4.7	5	100785.5	47
392	6.7	33.7	0.0	5.6	5	100785.5	47
393	5.7	33.7	0.1	4.8	5	100784.9	48
394	6.1	34.5	0.1	5.2	5	100784.0	50
395	6.4	34.4	0.0	5.4	5	100785.6	50
396	8.0	34.4	0.0	6.7	5	100785.6	50
397	8.9	33.2	0.0	7.5	5	100785.6	50
398	7.6	33.8	0.0	6.4	5	100785.5	50
399	8.2	36.1	0.0	6.9	5	100784.2	49
400	7.4	35.6	0.0	6.2	5	100784.5	48
401	8.4	37.1	0.0	7.1	5	100785.3	48
402	7.3	34.6	0.0	6.2	5	100785.3	48
403	6.7	38.7	0.0	5.7	5	100785.4	48
404	7.8	36.8	0.0	6.6	5	100785.5	48
405	8.1	36.2	0.0	6.8	5	100784.0	48
406	9.1	37.4	0.0	7.6	5	100784.7	47
407	8.3	37.1	0.0	7.0	5	100785.3	47
408	8.5	37.0	0.0	7.2	5	100784.9	47
409	9.0	40.3	0.0	7.6	5	100785.4	47
410	9.6	41.0	0.2	8.1	5	100785.0	47
411	9.2	39.6	0.0	7.8	5	100784.1	46
412	10.4	40.3	0.0	8.8	5	100785.1	46
413	9.5	40.3	0.0	8.0	5	100785.3	46
414	9.7	39.1	0.0	8.1	5	100785.2	46
415	8.6	41.6	0.0	7.2	5	100785.2	46

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
416	8.1	41.9	0.0	6.9	5	100784.7	46
417	8.9	39.8	0.0	7.5	5	100784.1	46
418	9.2	40.8	0.0	7.8	5	100784.9	47
419	10.0	37.9	0.0	8.4	5	100785.0	47
420	9.1	38.9	0.0	7.6	5	100785.1	47
421	10.1	41.3	0.0	8.5	5	100785.0	47
422	9.6	40.4	0.0	8.0	5	100783.6	47
423	9.4	44.0	0.0	7.9	5	100784.0	46
424	8.3	43.6	0.0	7.0	5	100784.6	46
425	9.0	41.7	0.0	7.6	5	100784.9	46
426	9.0	41.5	0.0	7.5	5	100785.0	46
427	9.0	42.7	0.1	7.5	5	100784.4	46
428	8.5	41.3	0.1	7.2	5	100783.4	46
429	8.5	40.0	0.0	7.1	5	100784.7	46
430	7.7	39.2	0.0	6.5	5	100784.6	47
431	7.1	38.1	0.0	6.0	5	100784.6	47
432	7.7	38.5	0.0	6.5	5	100784.8	47
433	8.1	36.8	0.0	6.8	5	100784.1	47
434	8.2	37.3	0.0	6.9	5	100783.8	47
435	10.6	38.9	0.0	8.9	5	100785.1	48
436	9.5	38.9	0.0	8.0	5	100785.2	49
437	9.2	39.2	0.0	7.7	5	100785.1	49
438	9.2	45.0	0.0	7.8	5	100784.7	49
439	9.1	41.3	0.0	7.6	5	100785.5	49
440	7.8	41.5	0.0	6.6	5	100785.9	49
441	9.1	40.6	0.0	7.6	5	100786.0	49
442	9.1	40.7	0.0	7.7	5	100786.4	49
443	9.4	38.2	0.0	7.9	5	100786.2	49
444	9.1	37.3	0.0	7.7	5	100786.1	49
445	9.4	39.6	0.0	7.9	5	100785.9	49
446	8.7	38.6	0.0	7.3	5	100786.0	49
447	8.1	39.1	0.2	6.9	5	100786.0	48
448	8.4	40.0	0.1	7.0	5	100786.1	47
449	7.9	38.9	0.0	6.7	5	100786.1	47
450	8.8	37.4	0.0	7.4	5	100785.7	47
451	9.1	38.4	0.0	7.7	5	100785.7	47
452	8.5	40.6	0.0	7.1	5	100785.9	47
453	8.0	43.0	0.0	6.7	5	100786.1	48
454	7.9	41.2	0.0	6.6	5	100786.1	48
455	7.8	42.1	0.0	6.5	5	100786.1	48
456	9.5	40.6	0.0	8.0	5	100786.0	48
457	9.1	39.2	0.0	7.6	5	100786.2	48
458	8.2	39.8	0.0	6.9	5	100786.2	48
459	8.9	43.5	0.0	7.5	5	100786.3	48
460	8.5	40.5	0.0	7.2	5	100786.2	48
461	7.7	40.9	0.0	6.5	5	100786.5	48
462	8.1	36.8	0.0	6.8	5	100786.3	48
463	6.6	35.7	0.0	5.5	5	100786.6	48
464	6.6	35.3	0.0	5.5	5	100786.6	48
465	7.4	36.5	0.0	6.2	5	100786.7	48
466	7.7	35.5	0.0	6.5	5	100786.6	49
467	8.7	40.0	0.0	7.4	5	100786.4	49
468	9.2	39.3	0.0	7.8	5	100786.2	49
469	8.7	41.0	0.0	7.4	5	100786.7	49
470	8.9	39.6	0.0	7.5	5	100786.8	49
471	9.5	38.6	0.0	8.0	5	100786.7	48
472	9.4	40.6	0.0	7.9	5	100786.6	46
473	10.0	40.0	0.0	8.4	5	100786.7	46
474	9.4	39.2	0.0	7.9	5	100786.4	46
475	9.1	40.5	0.1	7.7	5	100786.5	46
476	9.5	38.3	0.1	8.0	5	100786.5	46
477	9.1	42.8	0.0	7.7	5	100786.4	47
478	8.5	40.4	0.0	7.2	5	100786.3	47
479	9.4	42.8	0.0	7.9	5	100786.3	47
480	10.0	42.3	0.0	8.4	5	100786.2	47
481	10.0	41.4	0.0	8.4	5	100786.4	47
482	10.1	40.4	0.0	8.5	5	100786.3	47
483	9.6	39.5	0.0	8.1	5	100786.5	46
484	9.1	41.0	0.0	7.7	5	100786.6	45
485	9.8	41.1	0.0	8.2	5	100785.7	45
486	9.6	39.2	0.0	8.0	5	100784.8	45
487	8.5	39.3	0.0	7.1	5	100784.9	45
488	8.4	39.0	0.0	7.1	5	100784.5	45
489	9.3	41.0	0.0	7.8	5	100784.5	47
490	10.6	38.8	0.0	8.9	5	100784.4	49
491	10.1	41.0	0.1	8.5	5	100784.4	49
492	9.6	42.7	0.2	8.1	5	100784.6	49
493	9.7	40.2	0.0	8.2	5	100784.5	49
494	9.6	42.5	0.0	8.1	5	100784.3	49
495	9.0	39.6	0.0	7.6	5	100784.2	48
496	8.4	37.6	0.0	7.0	5	100784.2	47
497	8.2	38.3	0.0	6.9	5	100784.3	47
498	7.8	37.9	0.0	6.6	5	100784.4	47

Table E.02 Measurement data - Background

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-13

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
499	8.8	38.0	0.0	7.4	5	100784.1	47
500	8.2	35.5	0.0	6.9	5	100783.9	47
501	8.9	40.4	0.0	7.5	5	100784.1	48
502	8.0	44.3	0.0	6.7	5	100784.0	49
503	8.1	44.3	0.0	6.8	5	100784.4	49
504	9.5	44.7	0.0	8.0	5	100784.2	49
505	9.9	44.1	0.1	8.4	5	100784.1	49
506	9.8	45.2	0.2	8.2	5	100784.1	49
507	9.1	44.1	0.2	7.7	5	100784.0	48
508	9.1	45.4	0.2	7.6	5	100783.8	45
509	8.9	43.3	0.0	7.5	5	100784.0	45
510	10.5	39.1	0.0	8.8	5	100784.4	45
511	10.4	36.9	0.0	8.8	5	100784.4	45
512	9.1	37.6	0.0	7.7	5	100784.1	45
513	8.7	40.9	0.0	7.4	5	100784.1	46
514	9.0	39.4	0.0	7.6	5	100784.1	47
515	9.0	42.9	0.0	7.6	5	100784.1	47
516	10.3	41.5	0.0	8.7	5	100785.0	47
517	10.3	42.5	0.0	8.7	5	100786.1	47
518	9.6	43.8	0.0	8.0	5	100786.0	47
519	9.2	42.4	0.2	7.8	5	100785.4	47
520	6.7	40.7	0.1	5.7	5	100784.3	47
521	6.2	40.7	0.0	5.3	5	100784.8	47
522	6.7	40.4	0.0	5.6	5	100785.0	47
523	6.6	37.4	0.1	5.6	5	100785.1	47
524	5.0	34.7	0.2	4.2	5	100784.7	47
525	7.9	34.3	0.2	6.6	5	100784.4	49
526	8.4	33.1	0.0	7.0	5	100784.4	53
527	8.6	32.4	0.0	7.2	5	100784.6	53
528	9.7	33.6	0.0	8.2	5	100784.8	53
529	10.2	37.4	0.0	8.6	5	100785.1	53
530	10.3	39.8	0.0	8.7	5	100785.2	53
531	10.7	40.7	0.0	9.0	5	100790.6	51
532	9.0	43.1	0.0	7.6	5	100799.5	48
533	10.0	42.7	0.0	8.5	5	100799.8	48
534	10.1	43.5	0.0	8.5	5	100800.0	48
535	9.9	43.7	0.0	8.3	5	100800.1	48
536	9.7	41.4	0.0	8.1	5	100800.1	48
537	9.0	42.3	0.0	7.6	5	100799.9	47
538	9.2	39.0	0.0	7.8	5	100799.9	47
539	9.3	40.1	0.0	7.8	5	100800.2	47
540	9.4	41.1	0.0	7.9	5	100800.2	47
541	9.0	41.3	0.0	7.5	5	100800.1	47
542	7.4	42.7	0.0	6.2	5	100800.4	47
543	7.6	40.7	0.0	6.4	5	100800.4	48
544	9.0	41.2	0.2	7.6	5	100800.6	49
545	7.7	39.6	0.2	6.5	5	100800.3	49
546	7.4	38.7	0.1	6.3	5	100800.2	49
547	7.8	37.0	0.0	6.5	5	100800.2	49
548	7.9	37.4	0.1	6.6	5	100800.1	49
549	8.0	39.5	0.0	6.7	5	100800.2	49
550	7.3	37.3	0.0	6.1	5	100800.0	48
551	8.5	36.2	0.0	7.2	5	100799.6	48
552	9.3	35.7	0.0	7.8	5	100799.7	48
553	7.5	36.1	0.0	6.4	5	100800.1	48
554	7.4	37.8	0.0	6.2	5	100800.1	48
555	8.1	37.5	0.0	6.8	5	100800.1	48
556	8.4	40.0	0.0	7.1	5	100799.9	48
557	8.6	43.9	0.0	7.2	5	100799.5	48
558	9.1	45.0	0.0	7.7	5	100799.7	48
559	9.0	44.4	0.0	7.6	5	100799.8	48
560	8.6	42.2	0.0	7.2	5	100800.0	48
561	7.8	44.8	0.0	6.6	5	100799.9	49
562	7.4	44.3	0.0	6.2	5	100799.6	49
563	9.0	45.4	0.0	7.6	5	100799.8	49
564	10.3	40.5	0.0	8.7	5	100799.8	49
565	9.2	41.1	0.0	7.7	5	100799.9	49
566	9.7	40.2	0.0	8.1	5	100800.2	49
567	10.0	43.1	0.0	8.4	5	100800.1	49
568	9.3	38.2	0.0	7.9	5	100799.9	48
569	8.8	35.9	0.0	7.4	5	100799.8	48
570	8.3	43.0	0.0	7.0	5	100800.1	48
571	8.2	39.5	0.0	6.9	5	100800.1	48
572	8.1	37.3	0.0	6.8	5	100800.0	48
573	8.4	37.4	0.0	7.1	5	100799.9	47
574	8.1	38.4	0.0	6.8	5	100799.8	47
575	8.4	36.5	0.0	7.1	5	100799.7	47
576	7.5	37.3	0.0	6.3	5	100799.7	47
577	8.2	38.2	0.0	6.9	5	100799.5	47
578	7.1	37.3	0.0	5.9	5	100799.6	47
579	7.2	37.9	0.0	6.0	5	100799.6	48
580	7.5	38.4	0.0	6.3	5	100799.5	49
581	7.7	41.1	0.0	6.5	5	100799.4	49

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
582	7.1	39.1	0.0	6.0	5	100799.4	49
583	9.7	38.8	0.0	8.2	5	100799.5	49
584	7.8	40.0	0.0	6.6	5	100799.7	49
585	8.4	41.6	0.0	7.1	5	100799.7	49
586	8.8	43.0	0.0	7.4	5	100799.7	49
587			0.0	7.1	5	100799.8	49
588			0.0	7.5	5	100800.0	49
589			0.0	8.0	5	100800.1	49
590			0.0	7.6	5	100800.1	49
591			0.0	7.7	5	100799.9	47
592	8.8	43.5	0.0	7.4	5	100799.9	47
593	8.9	41.8	0.0	7.5	5	100800.1	47
594	8.9	37.4	0.0	7.5	5	100800.1	47
595	8.7	37.1	0.0	7.3	5	100800.1	47
596	7.4	37.9	0.0	6.2	5	100800.0	47
597	8.0	39.7	0.0	6.7	5	100800.0	47
598	7.5	39.6	0.1	6.3	5	100799.8	47
599	7.6	39.3	0.0	6.4	5	100799.8	47
600	7.4	38.2	0.0	6.2	5	100799.8	47
601	7.3	37.8	0.0	6.1	5	100799.9	47
602	8.8	39.4	0.0	7.5	5	100799.8	47
603	9.4	40.3	0.0	7.9	5	100799.6	48
604	9.5	41.0	0.0	8.0	5	100799.7	49
605	8.3	45.2	0.0	7.0	5	100799.9	49
606	7.5	43.0	0.0	6.3	5	100800.0	49
607	7.6	40.8	0.0	6.4	5	100799.9	49
608	8.3	40.5	0.0	7.0	5	100799.7	49
609	8.5	40.7	0.0	7.1	5	100799.7	47
610	9.9	37.2	0.0	8.4	5	100799.5	47
611	10.9	37.4	0.0	9.2	5	100799.7	47
612	9.0	38.9	0.0	7.6	5	100799.9	47
613	7.5	43.4	0.0	6.3	5	100799.9	47
614	7.1	43.0	0.0	6.0	5	100799.7	47
615	7.7	39.7	0.0	6.5	5	100799.6	48
616	7.8	39.2	0.0	6.6	5	100799.5	48
617	8.0	38.2	0.1	6.7	5	100799.5	48
618	9.7	39.0	0.0	8.1	5	100799.5	48
619	9.6	41.6	0.0	8.1	5	100799.6	48
620	10.2	42.0	0.0	8.6	5	100799.6	48
621	10.0	42.0	0.0	8.4	5	100799.8	46
622	9.5	45.4	0.0	8.0	5	100799.8	46
623	11.3	42.8	0.0	9.5	5	100799.9	46
624	12.3	43.3	0.0	10.4	5	100800.0	46
625	11.0	41.6	0.0	9.3	5	100800.3	46
626	11.7	44.2	0.0	9.8	5	100799.9	46
627	10.6	47.4	0.0	8.9	5	100800.0	46
628	11.2	44.6	0.0	9.5	5	100800.0	46
629	9.3	41.0	0.0	7.8	5	100800.1	46
630	10.6	42.5	0.0	8.9	5	100800.0	46
631	10.4	41.9	0.0	8.8	5	100799.9	46
632	11.7	42.9	0.0	9.8	5	100799.8	46
633	11.8	40.5	0.0	9.9	5	100799.7	46
634	10.2	44.8	0.0	8.5	5	100799.9	46
635	10.3	41.4	0.0	8.7	5	100799.7	46
636	10.1	43.2	0.0	8.5	5	100799.7	46
637	9.1	39.6	0.0	7.7	5	100799.8	46
638	8.2	41.6	0.1	6.9	5	100799.8	46
639	8.9	41.5	0.3	7.5	5	100799.8	47
640	8.5	35.7	0.3	7.2	5	100799.3	47
641	7.7	36.5	0.2	6.5	5	100799.2	47
642	7.4	42.3	0.1	6.2	5	100799.1	47
643	8.8	42.7	0.0	7.4	5	100799.0	47
644	8.5	44.1	0.0	7.1	5	100799.0	47
645	7.4	39.3	0.0	6.2	5	100799.0	48
646	8.2	38.6	0.0	6.9	5	100799.0	49
647	8.8	38.0	0.0	7.4	5	100799.2	49
648	8.2	41.6	0.0	6.9	5	100799.1	49
649	10.3	39.8	0.0	8.7	5	100799.0	49
650	10.2	39.9	0.0	8.6	5	100799.2	49
651	9.8	36.8	0.0	8.2	5	100799.0	46
652	8.4	40.2	0.0	7.0	5	100798.9	46
653	8.7	40.2	0.0	7.3	5	100799.1	46
654	8.8	40.8	0.0	7.4	5	100799.0	46
655	8.3	37.5	0.0	7.0	5	100799.0	46
656	7.6	38.6	0.0	6.4	5	100798.9	46
657	7.0	37.6	0.0	5.9	5	100798.8	48
658	6.9	36.6	0.0	5.8	5	100798.8	49
659	6.8	36.7	0.0	5.7	5	100798.9	49
660	6.2	38.1	0.0	5.2	5	100798.8	49
661	7.1	38.1	0.0	6.0	5	100799.0	49
662	7.9	39.8	0.0	6.7	5	100799.0	49
663	9.1	37.8	0.1	7.7	5	100799.3	49
664	10.1	37.6	0.0	8.5	5	100799.1	49

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
665	9.3	38.9	0.0	7.8	5	100798.8	49
666	7.5	39.6	0.0	6.3	5	100798.8	49
667	7.1	38.1	0.0	6.0	5	100798.7	49
668	7.3	42.0	0.0	6.1	5	100798.9	49
669	7.3	39.7	0.0	6.1	5	100799.0	51
670	7.6	36.1	0.0	6.4	5	100798.7	51
671	9.7	38.1	0.0	8.2	5	100798.7	51
672	9.0	39.8	0.0	7.6	5	100798.6	51
673	8.3	41.1	0.0	7.0	5	100798.4	51
674	8.7	41.9	0.0	7.4	5	100798.4	50
675	10.3	42.6	0.0	8.7	5	100798.8	48
676	9.4	44.3	0.0	7.9	5	100798.8	48
677	9.2	45.2	0.0	7.8	5	100798.7	48
678	10.4	42.9	0.0	8.8	5	100798.6	48
679	9.8	41.3	0.0	8.3	5	100798.7	48
680	9.5	41.1	0.0	8.0	5	100798.5	47
681	9.5	43.1	0.0	8.0	5	100798.7	46
682	9.2	41.9	0.0	7.7	5	100798.6	46
683	8.1	41.1	0.0	6.8	5	100798.7	46
684	7.6	42.0	0.0	6.4	5	100798.6	46
685	7.5	43.6	0.0	6.3	5	100798.6	46
686	7.8	41.7	0.0	6.5	5	100801.7	47
687	9.0	41.2	0.0	7.6	5	100811.7	49
688	8.7	43.4	0.0	7.4	5	100811.7	49
689	9.9	45.8	0.1	8.3	5	100811.7	49
690	9.2	47.1	0.1	7.8	5	100811.7	49
691	8.7	43.7	0.0	7.3	5	100811.6	49
692	8.3	40.9	0.0	7.0	5	100811.6	49
693	8.8	42.1	0.0	7.4	5	100811.7	49
694	7.5	41.8	0.0	6.3	5	100811.6	49
695	7.0	40.7	0.0	5.9	5	100811.5	49
696	7.3	41.4	0.0	6.1	5	100811.6	49
697	7.0	40.6	0.0	5.9	5	100811.5	49
698	6.8	41.6	0.0	5.7	5	100811.6	50
699	6.4	39.3	0.0	5.4	5	100811.7	51
700	9.1	40.5	0.0	7.6	5	100811.7	51
701	8.1	38.8	0.0	6.8	5	100811.8	51
702	7.4	38.3	0.0	6.2	5	100811.7	51
703	6.4	39.6	0.0	5.4	5	100811.7	51
704	8.3	39.9	0.0	7.0	5	100811.6	50
705	7.4	36.4	0.0	6.2	5	100811.6	50
706	7.7	38.9	0.1	6.5	5	100811.7	50
707	7.8	39.1	0.2	6.6	5	100811.6	50
708	7.5	42.8	0.2	6.4	5	100811.6	50
709	7.3	44.4	0.2	6.1	5	100811.6	50
710	7.8	45.3	0.0	6.6	5	100811.7	49
711	8.5	40.6	0.0	7.2	5	100811.7	48
712	8.0	38.8	0.0	6.7	5	100811.7	48
713	8.1	39.7	0.0	6.8	5	100811.6	48
714	7.9	40.8	0.0	6.7	5	100811.6	48
715	8.5	39.9	0.0	7.2	5	100811.6	48
716	10.3	38.3	0.0	8.7	5	100811.6	48
717	10.3	39.4	0.0	8.7	5	100811.7	48
718	10.9	42.3	0.0	9.2	5	100811.8	48
719	11.2	40.5	0.0	9.4	5	100811.7	48
720	9.8	43.2	0.0	8.3	5	100811.7	48
721	9.4	41.1	0.0	7.9	5	100811.7	48
722	9.6	41.6	0.0	8.0	5	100811.7	46
723	9.4	42.4	0.0	7.9	5	100811.6	44
724	10.0	40.1	0.0	8.4	5	100811.3	44
725	9.1	40.7	0.0	7.7	5	100811.7	44
726	8.0	40.6	0.0	6.8	5	100811.4	44
727	8.0	40.5	0.0	6.8	5	100811.5	44
728	7.5	39.3	0.0	6.4	5	100811.1	46
729	10.8	38.2	0.0	9.1	5	100811.4	47
730	10.7	39.7	0.0	9.0	5	100811.5	47
731	10.3	39.1	0.0	8.7	5	100811.6	47
732	8.6	42.7	0.0	7.3	5	100811.7	47
733	7.3	44.3	0.0	6.2	5	100811.6	47
734	8.4	41.0	0.0	7.0	5	100811.6	47
735	9.1	41.0	0.0	7.7	5	100811.7	47
736	8.6	44.0	0.0	7.2	5	100811.6	47
737	8.5	44.3	0.2	7.1	5	100811.7	47
738	8.7	39.6	0.3	7.4	5	100811.7	47
739	11.7	39.1	0.2	9.8	5	100811.8	47
740	10.7	42.5	0.1	9.0	5	100811.7	46
741	10.0	41.8	0.0	8.5	5	100811.6	45
742	10.3	44.8	0.0	8.6	5	100811.7	45
743	11.1	41.6	0.0	9.3	5	100811.7	45
744	11.1	42.5	0.0	9.4	5	100811.8	45
745	10.0	43.3	0.0	8.4	5	100811.6	45
746	11.7	43.6	0.0	9.9	5	100811.7	46
747	9.8	42.7	0.0	8.2	5	100811.6	46

Table E.02 Measurement data - Background

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-13

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
748	9.9	44.7	0.0	8.3	5	100811.6	46
749	11.5	44.1	0.0	9.7	5	100811.5	46
750	12.4	42.9	0.0	10.5	5	100811.4	46
751	11.7	44.9	0.0	9.8	5	100811.4	46
752	10.6	46.7	0.0	8.9	5	100811.5	45
753	9.9	45.6	0.0	8.4	5	100811.4	44
754	10.3	43.1	0.0	8.6	5	100811.4	44
755	10.6	42.5	0.0	8.9	5	100811.3	44
756	11.8	42.9	0.0	9.9	5	100811.5	44
757	10.7	43.9	0.0	9.0	5	100811.7	44
758	9.5	44.7	0.0	8.0	5	100811.7	44
759	8.3	45.6	0.0	7.0	5	100811.6	44
760	7.8	43.7	0.0	6.6	5	100811.8	44
761	9.6	40.6	0.0	8.1	5	100811.8	44
762	10.3	40.0	0.0	8.7	5	100811.8	44
763	8.6	40.5	0.0	7.3	5	100811.9	44
764	7.9	42.4	0.0	6.7	5	100811.8	45
765	8.9	42.9	0.0	7.5	5	100811.8	46
766	9.7	40.6	0.0	8.2	5	100811.9	46
767	9.7	40.0	0.0	8.2	5	100811.7	46
768	8.6	39.7	0.0	7.2	5	100811.8	46
769	8.5	40.5	0.0	7.2	5	100811.7	46
770	9.0	39.7	0.0	7.6	5	100812.4	47
771	9.2	38.4	0.0	7.8	5	100812.5	47
772	8.9	40.7	0.0	7.5	5	100812.5	47
773	9.6	38.6	0.0	8.1	5	100812.6	47
774	10.1	38.1	0.0	8.5	5	100812.6	47
775	9.8	39.5	0.0	8.2	5	100812.7	47
776	10.3	38.9	0.0	8.7	5	100812.6	46
777	9.7	41.2	0.0	8.1	5	100812.5	45
778	8.0	39.9	0.0	6.7	5	100812.4	45
779	7.8	43.4	0.0	6.6	5	100812.4	45
780	7.3	41.8	0.0	6.2	5	100812.4	45
781	7.5	38.5	0.0	6.4	5	100812.4	45
782	8.7	37.6	0.0	7.3	5	100812.2	46
783	7.6	36.4	0.0	6.4	5	100812.4	47
784	7.0	35.3	0.0	5.9	5	100812.4	47
785	8.0	35.7	0.0	6.7	5	100812.4	47
786	7.2	35.8	0.0	6.1	5	100812.6	47
787	8.0	36.9	0.0	6.7	5	100812.3	47
788	8.1	35.6	0.0	6.8	5	100812.2	49
789	9.2	35.5	0.0	7.8	5	100812.3	49
790	8.7	37.1	0.0	7.4	5	100812.2	49
791	8.6	37.8	0.0	7.3	5	100812.1	49
792	8.4	38.7	0.0	7.1	5	100812.4	49
793	9.6	38.8	0.0	8.1	5	100812.4	49
794	9.1	38.9	0.1	7.7	5	100812.3	48
795	8.2	36.8	0.3	6.9	5	100812.4	47
796	8.9	37.9	0.2	7.5	5	100812.5	47
797	8.3	39.6	0.2	7.0	5	100812.6	47
798	7.8	37.2	0.0	6.6	5	100812.5	47
799	8.6	38.0	0.0	7.2	5	100812.5	47
800	7.6	37.4	0.0	6.4	5	100812.6	48
801	6.6	36.0	0.0	5.6	5	100812.7	49
802	7.4	36.5	0.0	6.2	5	100812.5	49
803	6.9	37.9	0.0	5.8	5	100812.2	49
804	6.5	38.0	0.0	5.5	5	100812.2	49
805	7.6	39.3	0.2	6.4	5	100812.1	49
806			0.2	6.9	5	100812.1	50
807			0.2	7.0	5	100812.1	51
808			0.0	6.8	5	100812.2	51
809			0.0	7.8	5	100812.3	51
810			0.0	7.2	5	100812.2	51
811			0.0	7.2	5	100812.3	51
812			0.0	8.1	5	100812.6	49
813			0.0	8.6	5	100812.6	48
814			0.0	8.5	5	100812.8	48
815			0.0	7.8	5	100812.9	48
816			0.0	7.8	5	100812.6	48
817			0.0	9.0	5	100812.8	48
818			0.0	7.0	5	100812.7	48
819			0.0	7.8	5	100812.4	47
820			0.1	9.5	5	100812.6	47
821			0.1	9.5	5	100812.4	47
822			0.0	9.6	5	100812.5	47
823			0.1	9.2	5	100812.6	47
824			0.2	10.0	5	100812.4	45
825			0.1	9.7	5	100812.5	45
826	9.7	42.0	0.0	8.2	5	100812.6	45
827	10.0	44.8	0.0	8.5	5	100812.4	45
828	10.4	44.4	0.0	8.8	5	100812.4	45
829	11.2	42.4	0.0	9.5	5	100812.5	45
830	11.4	45.6	0.0	9.6	5	100812.4	44

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
831	10.0	43.2	0.0	8.4	5	100812.3	44
832	9.0	42.0	0.0	7.6	5	100812.4	44
833	8.8	45.6	0.0	7.4	5	100812.4	44
834	7.6	41.5	0.0	6.4	5	100812.4	44
835	7.8	37.8	0.0	6.6	5	100812.7	44
836	9.0	37.6	0.0	7.6	5	100813.6	48
837	10.0	36.8	0.0	8.4	5	100812.3	48
838	10.9	36.5	0.0	9.2	5	100812.4	48
839	9.6	40.7	0.0	8.1	5	100812.4	48
840	8.8	44.1	0.0	7.4	5	100812.4	48
841	8.5	39.7	0.0	7.2	5	100814.0	48
842	7.6	40.6	0.0	6.4	5	100825.1	47
843	8.2	41.9	0.0	6.9	5	100825.1	47
844	8.1	42.7	0.0	6.8	5	100825.1	47
845	7.4	43.6	0.0	6.3	5	100825.2	47
846	7.8	40.6	0.0	6.6	5	100825.2	47
847	7.6	38.8	0.0	6.4	5	100825.3	47
848	9.3	37.5	0.0	7.8	5	100825.4	50
849	9.2	36.3	0.0	7.8	5	100825.2	50
850	8.6	41.9	0.0	7.2	5	100825.1	50
851	7.6	43.6	0.0	6.4	5	100825.2	50
852	8.2	40.6	0.0	6.9	5	100825.2	50
853	7.2	38.9	0.0	6.1	5	100825.0	50
854	9.1	40.1	0.0	7.7	5	100825.0	48
855	11.1	42.3	0.2	9.4	5	100825.1	48
856	10.4	41.9	0.0	8.8	5	100825.3	48
857	10.3	40.6	0.0	8.7	5	100825.4	48
858	10.7	42.0	0.2	9.0	5	100825.5	48
859	13.5	45.6	0.1	11.4	5	100825.6	48
860	12.6	45.8	0.0	10.6	5	100825.5	45
861			0.0	9.7	5	100825.4	45
862			0.0	9.9	5	100825.4	45
863	11.7	44.5	0.0	9.9	5	100825.1	45
864	11.0	45.4	0.0	9.3	5	100825.2	45
865	10.6	42.7	0.0	8.9	5	100825.1	44
866	11.3	41.6	0.0	9.5	5	100825.5	43
867	10.0	43.7	0.0	8.4	5	100825.3	43
868	9.8	46.4	0.0	8.3	5	100825.3	43
869	8.5	44.7	0.0	7.2	5	100825.1	43
870	8.7	42.1	0.0	7.3	5	100825.1	43
871	8.8	42.2	0.0	7.4	5	100830.6	45
872	8.3	41.2	0.0	7.0	5	100838.2	49
873	9.5	43.1	0.0	8.0	5	100838.1	49
874	9.8	39.7	0.0	8.3	5	100838.0	49
875	9.4	42.9	0.0	7.9	5	100838.3	49
876	9.3	40.6	0.0	7.8	5	100838.3	49
877	9.7	43.2	0.0	8.2	5	100838.3	47
878	9.1	40.4	0.0	7.6	5	100838.3	45
879	9.3	39.0	0.0	7.9	5	100838.6	45
880	9.6	41.0	0.0	8.1	5	100838.3	45
881			0.0	9.8	5	100838.3	45
882			0.0	7.4	5	100838.4	45
883			0.2	7.3	5	100838.3	46
884			0.1	7.3	5	100838.7	47
885			0.0	9.2	5	100838.9	47
886	10.7	43.3	0.0	9.0	5	100838.9	47
887	9.4	45.0	0.0	8.0	5	100838.6	47
888	9.2	42.4	0.0	7.7	5	100838.2	47
889	10.8	43.4	0.0	9.1	5	100838.1	47
890	11.0	43.8	0.0	9.3	5	100838.4	47
891			0.0	9.5	5	100838.4	47
892	11.6	45.6	0.0	9.8	5	100838.3	47
893	10.4	44.3	0.1	8.8	5	100838.2	47
894	9.1	45.1	0.0	7.7	5	100838.2	47
895	9.8	46.4	0.0	8.3	5	100838.2	46
896	10.2	43.4	0.0	8.6	5	100838.2	46
897	10.2	43.1	0.0	8.6	5	100838.0	46
898	10.6	45.7	0.0	8.9	5	100838.0	46
899	10.9	43.5	0.0	9.2	5	100838.0	46
900	9.9	43.8	0.0	8.3	5	100838.0	46
901	11.0	42.6	0.0	9.2	5	100838.1	45
902	10.3	43.6	0.0	8.7	5	100838.0	45
903	11.6	46.2	0.2	9.7	5	100837.9	45
904	10.3	42.1	0.1	8.7	5	100837.9	45
905	9.4	42.8	0.0	7.9	5	100837.8	45
906	10.8	44.5	0.0	9.1	5	100837.9	45
907	9.9	42.1	0.0	8.4	5	100838.2	45
908	9.1	43.1	0.0	7.6	5	100838.1	45
909	12.0	43.7	0.0	10.1	5	100838.1	45
910	11.2	43.7	0.2	9.4	5	100838.2	45
911	10.9	45.3	0.0	9.2	5	100838.2	45
912	11.5	43.2	0.0	9.7	5	100838.1	45
913	12.9	43.8	0.0	10.8	5	100838.1	45

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
914	12.2	43.3	0.0	10.3	5	100838.1	45
915			0.0	9.1	5	100838.0	45
916			0.0	9.3	5	100838.2	45
917	11.3	44.4	0.0	9.5	5	100838.0	45
918	11.9	43.4	0.0	10.0	5	100837.9	45
919	10.6	44.9	0.0	8.9	5	100838.2	45
920	10.5	46.1	0.0	8.9	5	100838.3	45
921	10.0	45.9	0.0	8.4	5	100838.2	45
922	9.2	43.1	0.0	7.7	5	100838.0	45
923	7.8	44.6	0.0	6.5	5	100838.0	45
924	7.4	41.5	0.0	6.2	5	100838.2	45
925	7.7	38.5	0.0	6.5	5	100838.1	47
926	9.3	41.3	0.0	7.9	5	100838.1	48
927	10.1	39.0	0.0	8.5	5	100838.0	48
928	10.9	39.7	0.0	9.2	5	100838.1	48
929	12.6	40.1	0.0	10.6	5	100838.2	48
930	9.3	38.3	0.0	7.9	5	100838.2	48
931	9.0	42.3	0.0	7.5	5	100838.0	46
932	9.5	45.1	0.0	8.0	5	100838.1	45
933	9.3	41.1	0.0	7.8	5	100838.1	45
934	9.1	39.2	0.0	7.7	5	100838.2	45
935	11.1	38.6	0.0	9.3	5	100838.2	45
936	9.4	39.6	0.1	7.9	5	100837.8	45
937	8.4	40.2	0.1	7.1	5	100837.9	46
938	7.0	39.7	0.0	5.9	5	100837.8	46
939	8.2	42.3	0.0	6.9	5	100837.8	46
940	9.8	42.0	0.0	8.3	5	100838.0	46
941	10.1	43.0	0.0	8.5	5	100837.9	46
942	10.4	42.6	0.0	8.8	5	100837.8	46
943			0.0	10.2	5	100837.8	46
944			0.0	8.1	5	100837.7	46
945			0.0	7.7	5	100837.6	46
946	12.7	43.7	0.1	10.7	5	100837.8	46
947	12.8	44.8	0.1	10.8	5	100838.0	46
948	11.6	43.3	0.0	9.8	5	100838.0	45
949	10.1	46.1	0.0	8.5	5	100837.8	44
950	8.2	43.3	0.0	6.9	5	100837.6	44
951	9.9	42.6	0.0	8.3	5	100837.8	44
952	11.0	40.9	0.0	9.2	5	100837.9	44
953	11.0	40.1	0.0	9.3	5	100837.8	44
954	10.6	40.3	0.0	8.9	5	100838.1	45
955	10.2	41.1	0.0	8.6	5	100838.1	46
956	9.7	46.6	0.0	8.2	5	100838.1	46
957	9.3	42.4	0.2	7.8	5	100838.2	46
958	9.9	41.5	0.2	8.4	5	100838.0	46
959	9.2	40.9	0.1	7.8	5	100837.8	46
960	9.6	41.3	0.0	8.1	5	100837.6	46
961	8.1	42.5	0.0	6.8	5	100837.8	46
962	7.9	39.6	0.0	6.6	5	100837.8	46
963	9.9	41.2	0.0	8.4	5	100837.7	46
964	12.0	37.7	0.0	10.1	5	100837.7	46
965	10.2	41.1	0.0	8.6	5	100837.6	46
966	10.7	43.1	0.0	9.0	5	100837.4	46
967	9.2	42.4	0.0	7.7	5	100837.5	47
968	8.1	43.7	0.0	6.8	5	100837.6	47
969	8.4	44.0	0.0	7.1	5	100837.6	47
970	7.4	39.4	0.0	6.2	5	100837.5	47
971	8.0	38.1	0.0	6.8	5	100837.7	47
972	8.1	38.9	0.0	6.9	5	100837.2	47
973	7.2	38.2	0.0	6.1	5	100837.6	50
974	6.7	38.3	0.0	5.6	5	100837.7	50
975	7.5	39.1	0.2	6.3	5	100837.6	50
976	7.5	36.3	0.0	6.3	5	100837.7	50
977	6.8	35.3	0.0	5.7	5	100837.7	50
978	8.4	37.5	0.0	7.0	5	100837.5	50
979	9.0	39.8	0.0	7.6	5	100837.6	49
980	8.2	39.7	0.0	6.9	5	100837.7	49
981	8.1	39.6	0.0	6.8	5	100837.6	49
982	8.4	38.4	0.0	7.1	5	100837.7	49
983	9.3	38.4	0.0	7.9	5	100837.6	49
984	9.8	38.0	0.0	8.2	5	100837.7	47
985	9.6	38.3	0.0	8.1	5	100837.7	46
986	8.1	38.8	0.0	6.8	5	100837.8	46
987	8.0	40.4	0.0	6.8	5	100837.8	46
988	9.2	41.6	0.0	7.7	5	100838.0	46
989	9.4	44.0	0.0	7.9	5	100837.8	46
990	9.4	45.3	0.0	7.9	5	100837.6	46
991	10.1	42.9	0.0	8.5	5	100837.7	46
992	9.0	42.7	0.0	7.6	5	100837.8	46
993	10.0	40.9	0.1	8.4	5	100837.8	46
994	9.8	41.9	0.0	8.2	5	100837.8	46
995	9.8	43.1	0.0	8.3	5	100837.8	46
996	10.2	41.7	0.0	8.6	5	100837.9	46

Table E.02 Measurement data - Background

Project: Nation Rise Wind Farm - IEC 61400- 11 Edition 3.0 - Turbine T12

Report ID: 16115.01.T12.RP3

Created on: 2022-04-13

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
997	9.2	40.4	0.1	7.8	5	100837.9	45
998	9.3	42.6	0.1	7.8	5	100838.1	45
999	9.5	42.5	0.0	8.0	5	100838.0	45
1000	10.3	43.8	0.2	8.7	5	100838.1	45
1001	11.0	45.4	0.3	9.2	5	100838.0	45
1002			0.3	9.3	5	100837.9	46
1003			0.2	9.6	5	100837.7	46
1004			0.2	8.4	5	100837.8	46
1005			0.1	7.4	5	100838.0	46
1006			0.2	7.2	5	100837.9	46
1007			0.1	6.4	5	100838.1	46
1008			0.0	6.9	5	100838.2	47
1009	9.0	41.2	0.0	7.6	5	100838.1	48
1010	8.3	39.6	0.1	7.0	5	100838.2	48
1011	7.9	39.8	0.1	6.7	5	100838.2	48
1012	9.6	38.2	0.0	8.1	5	100838.1	48
1013	9.2	39.5	0.0	7.7	5	100837.8	48
1014	9.5	42.6	0.1	8.0	5	100837.9	47
1015	9.7	41.9	0.2	8.2	5	100837.8	47
1016	11.1	41.2	0.0	9.3	5	100837.7	47
1017	10.6	41.9	0.0	9.0	5	100837.8	47
1018	9.2	42.9	0.0	7.8	5	100837.7	47
1019	11.6	44.0	0.0	9.8	5	100837.9	47
1020	10.9	42.2	0.0	9.2	5	100837.8	46
1021	10.9	41.3	0.0	9.2	5	100838.4	45
1022	9.7	43.8	0.0	8.2	5	100839.0	45
1023	9.0	43.5	0.0	7.6	5	100838.8	45
1024	8.3	43.0	0.0	7.0	5	100838.8	45
1025	8.9	39.9	0.0	7.5	5	100838.8	45
1026	7.5	37.6	0.0	6.3	5	100838.8	48
1027	8.7	39.2	0.0	7.3	5	100838.7	48
1028	7.4	44.3	0.0	6.2	5	100838.9	48
1029	7.0	40.5	0.0	5.9	5	100838.8	48
1030	6.8	40.2	0.0	5.7	5	100838.7	48
1031	6.4	39.6	0.0	5.4	5	100840.2	48
1032	8.2	41.4	0.0	6.9	5	100850.9	50
1033	9.0	36.8	0.0	7.6	5	100850.9	50
1034	11.8	37.9	0.1	9.9	5	100851.0	50
1035	9.6	39.3	0.0	8.1	5	100850.9	50
1036	9.2	47.0	0.0	7.7	5	100850.8	50
1037	8.3	44.8	0.0	7.0	5	100850.7	50
1038	7.8	41.3	0.0	6.6	5	100850.8	48
1039	7.9	40.2	0.0	6.6	5	100850.8	48
1040	6.9	40.6	0.0	5.8	5	100850.7	48
1041	8.6	41.0	0.0	7.3	5	100850.7	48
1042	7.5	41.8	0.0	6.3	5	100850.6	48
1043	8.2	39.1	0.0	6.9	5	100850.5	48
1044	7.5	38.3	0.0	6.3	5	100839.2	48
1045	8.2	37.7	0.0	6.9	5	100838.3	48
1046	7.6	38.3	0.0	6.4	5	100838.6	48
1047	8.7	36.6	0.0	7.4	5	100838.5	48
1048	8.4	36.4	0.0	7.1	5	100838.5	48
1049	8.6	36.4	0.0	7.2	5	100840.2	48
1050	7.7	40.5	0.0	6.5	5	100850.8	50
1051	7.3	40.1	0.0	6.1	5	100850.9	50
1052	7.3	37.1	0.0	6.2	5	100851.0	50
1053	6.0	37.5	0.0	5.0	5	100850.9	50
1054	6.8	38.4	0.0	5.7	5	100850.7	50
1055	7.3	38.5	0.0	6.1	5	100850.8	50
1056	8.2	37.3	0.0	6.9	5	100850.7	50
1057	7.2	37.1	0.0	6.1	5	100850.7	50
1058	7.3	41.0	0.0	6.2	5	100850.8	50
1059	8.0	41.2	0.0	6.8	5	100851.0	50
1060	6.9	37.6	0.0	5.8	5	100850.8	50
1061	7.4	38.2	0.0	6.2	5	100850.7	50
1062	7.5	37.8	0.0	6.3	5	100838.7	48
1063	8.5	36.2	0.0	7.1	5	100839.0	48
1064	11.6	36.8	0.0	9.8	5	100839.0	48
1065	10.7	39.2	0.0	9.0	5	100838.8	48
1066	11.7	43.6	0.0	9.8	5	100838.8	48
1067	10.3	45.0	0.0	8.7	5	100843.8	47
1068	9.8	45.3	0.0	8.3	5	100851.1	45
1069	10.2	45.6	0.0	8.6	5	100851.2	45
1070	12.7	42.5	0.0	10.7	5	100850.5	45
1071	9.9	41.6	0.0	8.3	5	100850.4	45
1072	9.8	46.6	0.0	8.3	5	100850.6	45
1073	9.5	46.2	0.0	8.0	5	100850.6	45
1074	11.4	42.0	0.0	9.6	5	100850.5	45
1075	12.4	42.8	0.0	10.4	5	100850.6	45
1076	9.6	42.5	0.0	8.1	5	100850.7	45
1077			0.0	9.5	5	100850.5	45
1078	9.6	45.9	0.0	8.1	5	100850.6	45
1079	10.5	45.7	0.0	8.8	5	100850.7	45

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
1080	10.7	40.4	0.0	9.0	5	100850.7	46
1081	10.4	43.9	0.0	8.7	5	100850.6	46
1082	9.6	45.0	0.0	8.1	5	100850.7	46
1083	8.9	39.8	0.0	7.5	5	100850.6	46
1084	8.9	43.2	0.0	7.5	5	100850.7	46
1085	9.1	42.3	0.0	7.7	5	100850.7	46
1086	8.4	41.3	0.0	7.0	5	100850.7	46
1087	9.3	41.2	0.0	7.9	5	100850.6	46
1088	8.6	40.1	0.0	7.3	5	100850.6	46
1089	9.1	39.8	0.0	7.6	5	100850.6	46
1090	9.0	42.2	0.0	7.5	5	100850.6	46
1091	8.5	40.7	0.0	7.2	5	100850.4	46
1092	8.9	41.2	0.0	7.5	5	100850.6	47
1093	8.0	43.8	0.0	6.7	5	100850.6	47
1094	8.5	46.2	0.0	7.2	5	100850.5	47
1095	9.5	40.3	0.0	8.0	4	100850.6	47
1096	9.6	42.4	0.0	8.1	5	100850.7	47
1097	9.1	40.8	0.0	7.7	5	100850.6	46
1098	9.6	41.8	0.0	8.1	5	100850.5	46
1099	8.5	40.5	0.0	7.2	5	100850.7	46
1100	7.6	41.2	0.0	6.4	5	100850.6	46
1101	8.0	42.0	0.0	6.7	5	100850.5	46
1102	7.7	42.6	0.0	6.5	5	100850.6	46
1103	7.4	42.4	0.0	6.3	4	100850.7	47
1104	7.7	40.2	0.0	6.5	4	100850.7	48
1105	7.7	40.2	0.0	6.5	4	100850.6	48
1106	8.6	39.3	0.0	7.3	4	100850.7	48
1107	8.9	37.2	0.0	7.5	4	100850.6	48
1108	8.5	37.0	0.0	7.2	4	100850.6	48
1109	8.5	43.0	0.0	7.1	4	100850.2	46
1110			0.0	6.6	4	100850.3	46
1111			0.0	5.6	4	100850.5	46
1112			0.1	5.9	4	100850.3	46
1113			0.1	6.6	4	100850.4	46
1114			0.0	6.6	4	100850.5	46
1115			0.0	7.0	4	100850.6	48
1116			0.0	6.0	4	100850.6	48
1117	7.0	42.4	0.0	5.9	4	100850.5	48
1118	7.9	40.2	0.0	6.6	4	100850.3	48
1119	8.7	38.6	0.0	7.4	4	100851.6	48
1120	8.8	37.4	0.0	7.4	4	100851.6	48
1121			0.0	7.1	5	100851.6	47
1122	6.7	38.2	0.0	5.7	5	100851.4	47
1123	6.0	39.5	0.0	5.0	5	100851.4	47
1124	6.5	41.4	0.0	5.4	5	100851.4	47
1125	7.1	39.2	0.0	5.9	5	100851.3	47
1126	6.4	38.3	0.0	5.4	5	100851.3	47
1127	6.4	38.2	0.0	5.4	5	100863.6	49
1128	7.1	38.6	0.0	6.0	5	100864.9	49
1129	7.7	37.9	0.0	6.5	5	100864.9	49
1130	6.7	42.5	0.0	5.6	5	100865.1	49
1131	7.0	38.6	0.0	5.9	5	100864.9	49
1132	6.9	39.2	0.0	5.8	5	100865.1	49
1133	8.2	37.1	0.0	6.9	5	100865.1	49
1134	9.6	37.6	0.0	8.1	5	100865.1	49
1135	9.1	35.7	0.0	7.7	5	100865.0	49
1136	8.7	36.6	0.0	7.3	5	100865.0	49
1137	7.5	38.3	0.0	6.3	5	100864.7	49
1138	6.9	39.7	0.0	5.8	5	100864.8	49
1139	6.2	38.7	0.0	5.2	5	100864.7	49
1140	6.5	40.2	0.0	5.4	5	100864.6	49
1141	6.4	37.5	0.0	5.4	5	100864.6	49
1142	6.9	37.1	0.0	5.8	5	100864.5	49
1143	6.7	38.1	0.0	5.6	5	100864.8	49
1144	7.6	38.8	0.0	6.4	5	100864.6	49
1145	7.0	38.1	0.0	5.9	4	100864.7	49
1146	6.7	39.3	0.0	5.6	4	100864.6	49
1147	7.9	37.6	0.0	6.6	4	100864.6	49
1148	8.3	38.2	0.0	7.0	4	100864.7	49
1149	7.1	38.0	0.0	6.0	4	100864.6	49
1150	6.7	36.1	0.0	5.6	4	100864.5	49
1151							
1152							
1153							
1154							
1155							
1156							
1157							
1158							
1159							
1160							
1161							
1162							

***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Laeq,n,oj	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (Pa)	Relative Humidity (%)
1163							
1164							
1165							
1166							
1167							
1168							
1169							
1170							
1171							
1172							
1173							
1174							
1175							
1176							
1177							
1178							
1179							
1180							
1181							
1182							
1183							
1184							
1185							
1186							
1187							
1188							
1189							
1190							
1191							
1192							
1193							
1194							
1195							
1196							
1197							
1198							
1199							
1200							
1201							
1202							
1203							
1204							
1205							
1206							
1207							
1208							
1209							
1210							
1211							
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1213							
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1242							
1243							
1244							
1245							

aercoustics

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

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

Appendix F
Supplementary Information for the Regulator

aercoustics

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

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

Appendix F.01
Calibration Certificates

ISO17025

As Left RECALIBRATION CERTIFICATE

Sales Region:	NA
Account:	Aercoustics Engineering Ltd
Instrument:	Simcenter SCADAS
Manufacturer:	Siemens Industry Software B.V.
Type:	SCR202
Serial number(s):	22143211
Calibration method:	Two calibrated external standards (DC voltage and frequency) are used to calibrate the internal Simcenter SCADAS references: time/frequency accuracy of the internal system clock and amplitude accuracy of the internal signal sources. All input channels are calibrated against the internal references.
Ambient conditions:	The calibrations have been carried out in a controlled environment, at an ambient temperature of 23,0°C ± 0.3°C and a relative humidity of 38% ± 5%.
Calibration date:	June 5, 2020
Results:	The calibration results, together with their associated uncertainties, are included in this calibration certificate. *Calibration results within specification.*
Uncertainty:	The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with publication EA-4/02.
Traceability:	The measurements have been executed using methods for which the traceability to international standards has been demonstrated towards the Raad voor Accreditatie.

Breda, June 5, 2020

Calibration performed by:

H. Dam, Customer Service Engineer

Certificate approved by:

F.Lemmens, Production Manager

Siemens Industry Software B.V.
Weidehek 53
4824 AT Breda
The Netherlands
Phone: +31 76 573 6363

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

MICROPHONE UNIT

Manufactured by:	**BRUEL & KJAER**
Model No:	**4189-A-021 (ID#00365)**
Serial No:	**2622170**
Calibration Recall No:	**32081**

Submitted By:

Customer:	**Iwona Stasiewicz**
Company:	**Aercoustics Engineering Ltd**
Address:	**1004 Middlegate Road**
	Mississauga, ON. Canada L4Z 4A9

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. **4189-A-021 BRUE**

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statement of conformance for ALL given specifications and standards fall under the decision rule: A= (L-(U95)*M), where A is acceptance limit, L is manufacturer specifications, U95 is confidence level of 95% at k=2, and M is managed guard-band mulitiplier. The guard-band multiplier increases false-accept risk in favor of decreasing false-reject risk. Although the false accept risk increases, it is still below the Z540.3 2% risk requirement. The decision rule has been communicated and approved by customer during contract review.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

ISO/IEC 17025:2017

Calibration Date: **24-Jun-21**

Certificate No: **32081 - 3**

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2017
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Brüel & Kjær Microphone Unit
Model No.: 4189-A-021 **Serial No.: 2622170**
Mic. Model No.: 4189 **Serial No.: 2625197**
Preamp. Model No.: 2671 **Serial No.: 2614901**
Company: Aercoustics Engineering Ltd. **I. D. No.: 00365**

Calibration results:

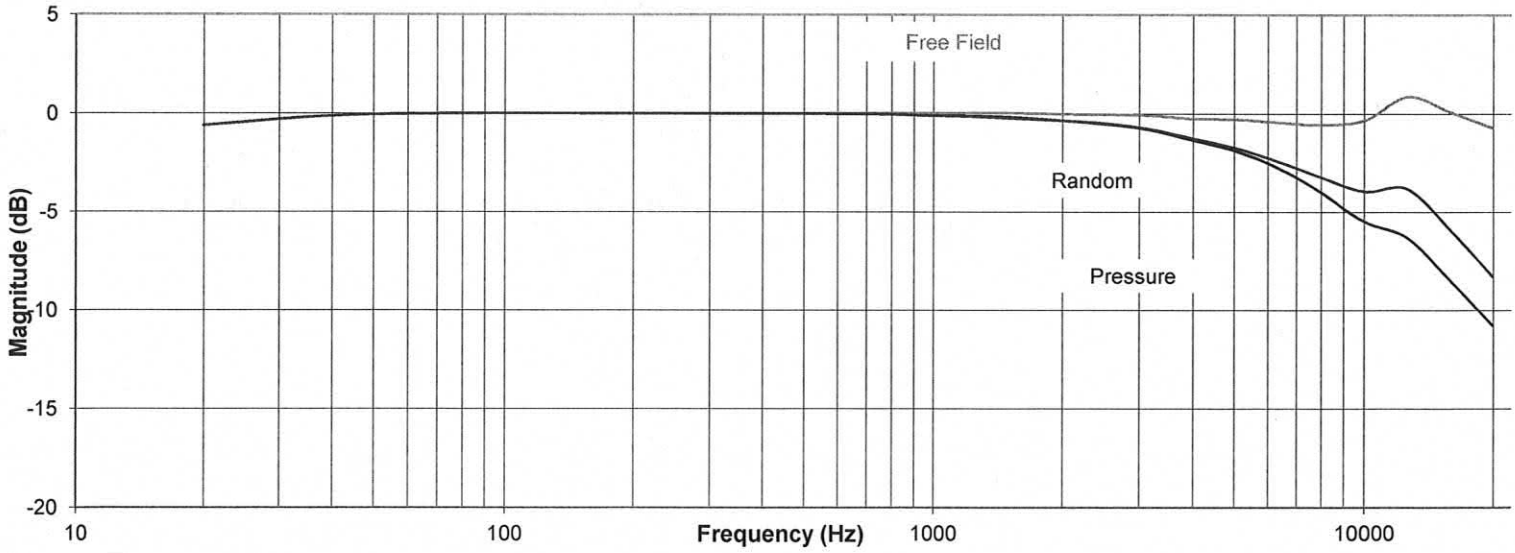
Before & after data same: ...X...

Combined Sensitivity @	**250**	**Hz**	**and pressure of**	**100.15**	**kPa**	Ambient Temperature:	**20.4**	°C
(Sens. with mic. and preamp.)	**0**	Volts Polarization voltage (External):				Ambient Humidity:	**45.3**	% RH
	-26.36	**dB re.1V/Pascal**				Ambient Pressure:	**100.154**	kPa
	48.11	**mV/Pascal**				Calibration Date:	**24-Jun-2021**	
	0.36	**Ko (- dB re 50 mV/Pascal)**				Calibration Due:	**24-Jun-2023**	
	Sensitivity:	**Pass**				Report Number:	**32081**	**-3**
	Freq. Response:	**Pass**				Control Number:	**32081**	
	All tests:	**Pass**						

The above listed instrument meets or exceeds the tested manufacturer's specifications.
The IEC 651:1979 & 1993 Type 1 specification passed.
This Calibration is traceable through NIST test numbers: 684.07/O-0000001126-20
The expanded uncertainty of calibration: 0.19 dB at 95% confidence level with a coverage factor of k=2.

The pressure response recorded with electroacoustic method.

Frequency Response



The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 P4189A021B&K**

Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2015, ISO 17025

Measurements performed by: .....
James Zhu

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Brüel & Kjær Microphone Unit **Model No.: 4189-A-021** **Serial No.: 2622170**
Company: Aercoustics Engineering Ltd. **I. D. No.: 00365**

Frequency Response (Reference = 0 dB @ 250Hz)

Frequency [Hz]	Pressure [dB]	Free Field (dB)	Random (dB)
19.95	-0.61	-0.61	-0.61
25.12	-0.44	-0.44	-0.44
31.62	-0.26	-0.26	-0.26
39.81	-0.13	-0.13	-0.13
50.12	-0.05	-0.05	-0.05
63.10	-0.02	-0.02	-0.02
79.43	0.00	0.00	0.00
100.00	0.01	0.01	0.01
125.89	0.01	0.01	0.01
158.49	0.00	0.00	0.00
199.53	0.00	0.00	0.00
251.19	0.00	0.00	0.00
316.23	0.00	0.00	0.00
398.11	0.00	0.01	0.00
501.19	-0.01	0.01	-0.01
630.96	-0.02	0.02	-0.02
794.33	-0.04	0.03	-0.04
1000.00	-0.08	0.02	-0.09
1258.93	-0.12	0.03	-0.15
1584.89	-0.19	0.03	-0.25
1995.26	-0.35	-0.02	-0.35
2511.89	-0.52	-0.04	-0.48
3162.28	-0.80	-0.09	-0.77
3981.07	-1.32	-0.26	-1.23
5011.87	-1.86	-0.29	-1.72
6309.57	-2.72	-0.44	-2.40
7943.28	-3.95	-0.56	-3.20
10000.00	-5.47	-0.35	-3.93
12589.25	-6.33	0.87	-3.82
15848.93	-8.51	0.07	-5.93
19952.62	-10.78	-0.73	-8.30

Freq. response: Expanded Uncertainty (dB) with coverage factor K = 2
20 to 63Hz 0.22 dB, 63 to 12.5kHz 0.20 dB, 12.5k to 16kHz 0.22 dB, 16k to 20kHz 0.5 dB.

Instruments used for calibration:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 1445428	23-Jun-2021	684.07/O-0000001126-20	23-Jun-2022
Brüel & Kjær	3560	S/N 2241893	30-Jun-2020	684.07/O-0000001126-20	30-Jun-2021
HP	33120A	S/N US360089	9-Jul-2020	,610119	9-Jul-2021
HP	34401A	S/N US360942	9-Jul-2020	,610119	9-Jul-2021

Cal. Date: 24-Jun-2021 **Tested by: James Zhu**

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

ACOUSTICAL CALIBRATOR

Manufactured by:	**BRUEL & KJAER**
Model No:	**4231**
Serial No:	**2053016**
Calibration Recall No:	**32185**

Submitted By:

Customer:	**Iwona Stasiewicz**
Company:	**Aercoustics Engineering Ltd**
Address:	**1004 Middlegate Road**
	Mississauga, ON. Canada L4Y0G1

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. 4231 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statement of conformance for ALL given specifications and standards fall under the decision rule: A= (L-(U95)*M), where A is acceptance limit, L is manufacturer specifications, U95 is confidence level of 95% at k=2, and M is managed guard-band mulitiplier. The guard-band multiplier increases false-accept risk in favor of decreasing false-reject risk. Although the false accept risk increases, it is still below the Z540.3 2% risk requirement. The decision rule has been communicated and approved by customer during contract review.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2015, and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

ISO/IEC 17025:2017

Calibration Date: **06-Aug-21**

Certificate No: **32185 - 1**

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

ICP SIGNAL CONDITIONER

Manufactured by:	**PCB PIEZOTRONICS**
Model No:	**480E09**
Serial No:	**36960**
Calibration Recall No:	**32379**

Submitted By:

Customer:	**Iwona Stasiewicz**
Company:	**Aercoustics Engineering Ltd**
Address:	**1004 Middlegate Road**
	Mississauga, ON. Canada L4Z 4A9

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. **480E09 PCB PI**

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied relates to the calibrated item listed above and statement of conformance for ALL given specifications and standards fall under the decision rule: A= (L-(U95)*M), where A is acceptance limit, L is manufacturer specifications, U95 is confidence level of 95% at k=2, and M is managed guard-band mulitiplier. The guard-band multiplier increases false-accept risk in favor of decreasing false-reject risk. Although the false accept risk increases, it is still below the Z540.3 2% risk requirement. The decision rule has been communicated and approved by customer during contract review.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements: ANSI/NCSL Z540-1, ISO 9001, and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: **29-Sep-21**

James Zhu

Quality Manager

Certificate No: **32379 - 2**

ISO/IEC 17025:2017

uncompromised calibration **West Caldwell Calibration Laboratories, Inc.**
1575 State Route 96, Victor, NY 14564, U.S.A.

ACCREDITED

Calibration Lab. Cert. # 1533.01

SOH Wind Engineering LLC
141 Leroy Road · Williston, VT 05495 · USA
Tel 802.316.4368 · Fax 802.735.9106 · www.sohwind.com

CERTIFICATE FOR CALIBRATION OF SONIC ANEMOMETER

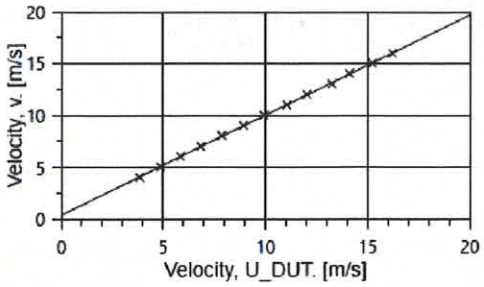
Certificate number: 20.US2.03809 **Date of issue:** July 14, 2020
Type: Vaisala Weather Transmitter, WXT520 **Serial number:** K2420011
Manufacturer: Vaisala, Oyj, Pl 26, FIN-00421 Helsinki, Finland
Client: Aercoustics Engineering Ltd., 1004 Middlegate RD, Suite 1100, S.Tower, Mississauga, ON L4Y 1M4, Canada

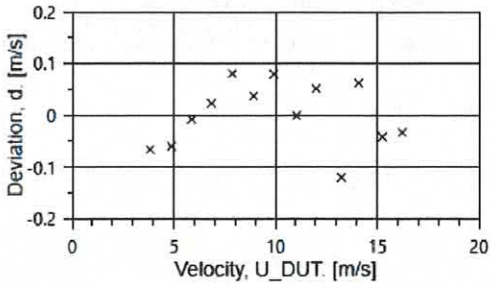
Anemometer received: July 08, 2020 **Anemometer calibrated:** July 10, 2020
Calibrated by: MEJ **Procedure:** MEASNET, IEC 61400-12-1:2017 Annex F
Certificate prepared by: EJF **Approved by:** Calibration engineer, EJF

Calibration equation obtained: v [m/s] = 0.96490 · U [m/s] + 0.36804

Standard uncertainty, slope: 0.00484 **Standard uncertainty, offset:** 0.13613
Covariance: -0.0002182 $(m/s)^2/m/s$ **Coefficient of correlation:** $\rho = 0.999871$
Absolute maximum deviation: -0.121 m/s at 13.026 m/s
Barometric pressure: 1002.0 hPa **Relative humidity:** 56.9%

Succession	Velocity pressure, q. [Pa]	Temperature in wind tunnel [°C]	d.p. box [°C]	Wind velocity, v. [m/s]	Anemometer Output, U. [m/s]	Deviation, d. [m/s]	Uncertainty u_c (k=2) [m/s]
1-first	9.24	28.2	27.6	4.010	3.8433	-0.067	0.023
13-last	14.47	28.4	27.7	5.019	4.8833	-0.061	0.026
2	20.81	28.2	27.6	6.017	5.8633	-0.008	0.030
12	28.14	28.4	27.7	7.001	6.8500	0.023	0.034
3	37.10	28.1	27.7	8.036	7.8633	0.080	0.039
11	46.69	28.4	27.7	9.019	8.9267	0.037	0.043
4	57.80	28.1	27.7	10.029	9.9300	0.080	0.047
10	69.78	28.4	27.7	11.026	11.0467	-0.001	0.051
5	82.92	28.2	27.6	12.015	12.0167	0.052	0.056
9	97.37	28.4	27.7	13.026	13.2433	-0.121	0.060
6	113.13	28.2	27.7	14.035	14.1000	0.062	0.064
8	129.66	28.4	27.7	15.031	15.2400	-0.042	0.068
7	146.80	28.3	27.7	15.992	16.2267	-0.034	0.073





EQUIPMENT USED

Serial Number	Description
Njord2	Wind tunnel, blockage factor = 1.0035
13924	Control cup anemometer
-	Mounting tube, D = 19 mm
TT002	Summit Electronics, 1XPT100, 0-10V Output, wind tunnel temp.
TP001	PR Electronics 5102, 0-10V Output, differential pressure box temp.
DP007	Setra Model 239, 0-1inWC, differential pressure transducer
HY003	Dwyer RHP-2D20, 0-10V Output, humidity transmitter
BP002	Setra M278, 0-5VDC Output, barometer
PL3	Pitot tube
XB001	Computer Board. 16 bit A/D data acquisition board
Njord2-PC	PC dedicated to data acquisition

The accuracies of all measurements were traceable to the SI through NIST or CIPM recognized NMI's.

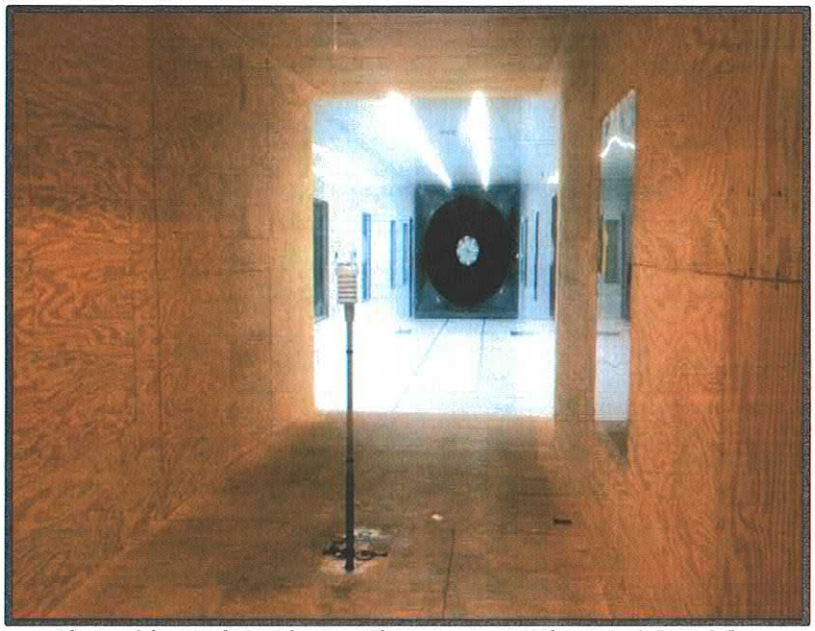


Photo of the wind tunnel setup. The cross-sectional area is 2.5m x 2.5m.

UNCERTAINTIES

The documented uncertainty is the total combined uncertainty at 95% confidence level (k=2) in accordance with EA-4/02. The uncertainty at 10 m/s comply with the requirements in the IEC 61400-12-1:2005 procedure. See Document US.12.01.004 for further details.

COMMENTS

This sensor was oriented in the 90° position during calibration.

Certificate number: 20.US2.03809

SOH Wind Engineering LLC
141 Leroy Road · Williston, VT 05495 · USA
Tel 802.316.4368 · Fax 802.735.9106 · www.sohwind.com

CERTIFICATE FOR CALIBRATION OF SONIC ANEMOMETER

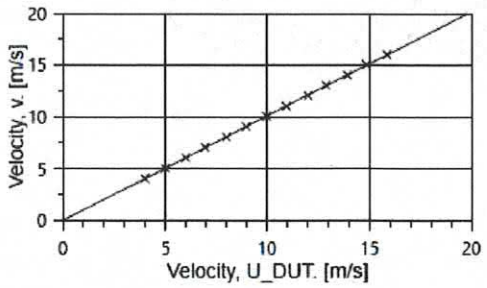
Certificate number: 20.US2.03808 **Date of issue:** July 14, 2020
Type: Vaisala Weather Transmitter, WXT520 **Serial number:** K2420011
Manufacturer: Vaisala, Oyj, Pl 26, FIN-00421 Helsinki, Finland
Client: Aercoustics Engineering Ltd., 1004 Middlegate RD, Suite 1100, S.Tower, Mississauga, ON L4Y 1M4, Canada

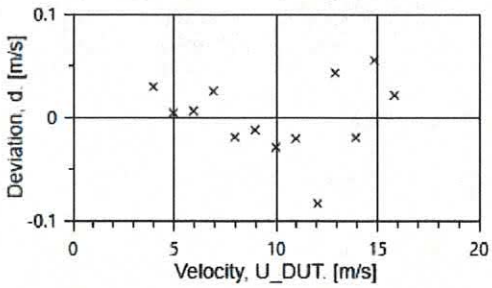
Anemometer received: July 08, 2020 **Anemometer calibrated:** July 10, 2020
Calibrated by: MEJ **Procedure:** MEASNET, IEC 61400-12-1:2017 Annex F
Certificate prepared by: EJF **Approved by:** Calibration engineer, EJF

Calibration equation obtained: v [m/s] = 1.01089 · U [m/s] + -0.03792

Standard uncertainty, slope: 0.00283 **Standard uncertainty, offset:** -0.80140
Covariance: -0.0000815 (m/s)²/m/s **Coefficient of correlation:** $\rho = 0.999956$
Absolute maximum deviation: -0.084 m/s at 12.043 m/s
Barometric pressure: 1002.8 hPa **Relative humidity:** 58.5%

Succession	Velocity pressure, q. [Pa]	Temperature in wind tunnel [°C]	d.p. box [°C]	Wind velocity, v. [m/s]	Anemometer Output, U. [m/s]	Deviation, d. [m/s]	Uncertainty u_c (k=2) [m/s]
1-first	9.31	27.3	27.8	4.018	3.9833	0.030	0.023
13-last	14.43	27.5	27.8	5.004	4.9833	0.004	0.026
2	20.88	27.3	27.8	6.017	5.9833	0.006	0.030
12	28.35	27.5	27.8	7.013	6.9500	0.025	0.034
3	37.19	27.3	27.8	8.030	8.0000	-0.019	0.039
11	47.00	27.6	27.8	9.031	8.9833	-0.012	0.043
4	58.16	27.3	27.8	10.042	10.0000	-0.029	0.047
10	70.07	27.6	27.8	11.027	10.9667	-0.021	0.051
5	83.64	27.3	27.8	12.043	12.0333	-0.084	0.056
9	98.05	27.6	27.8	13.045	12.9000	0.043	0.060
6	113.44	27.4	27.8	14.028	13.9333	-0.020	0.064
8	130.13	27.5	27.8	15.029	14.8500	0.055	0.068
7	147.63	27.4	27.8	16.006	15.8500	0.021	0.073





AC-1746

EQUIPMENT USED

Serial Number	Description
Njord2	Wind tunnel, blockage factor = 1.0035
13924	Control cup anemometer
-	Mounting tube, D = 19 mm
TT002	Summit Electronics, 1XPT100, 0-10V Output, wind tunnel temp.
TP001	PR Electronics 5102, 0-10V Output, differential pressure box temp.
DP007	Setra Model 239, 0-1inWC, differential pressure transducer
HY003	Dwyer RHP-2D20, 0-10V Output, humidity transmitter
BP002	Setra M278, 0-5VDC Output, barometer
PL3	Pitot tube
XB001	Computer Board. 16 bit A/D data acquisition board
Njord2-PC	PC dedicated to data acquisition

The accuracies of all measurements were traceable to the SI through NIST or CIPM recognized NMI's.

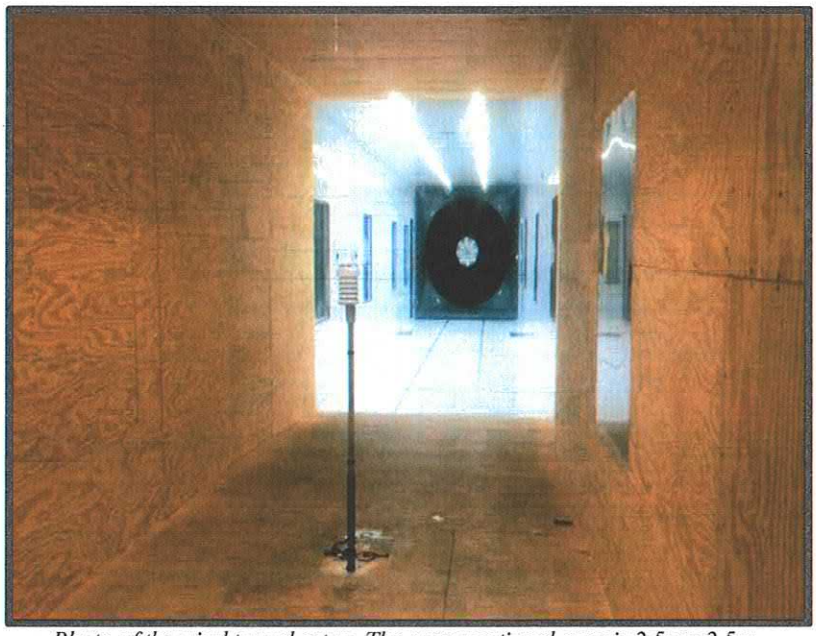


Photo of the wind tunnel setup. The cross-sectional area is 2.5m x 2.5m.

UNCERTAINTIES

The documented uncertainty is the total combined uncertainty at 95% confidence level (k=2) in accordance with EA-4/02. The uncertainty at 10 m/s comply with the requirements in the IEC 61400-12-1:2005 procedure. See Document US.12.01.004 for further details.

COMMENTS

This sensor was oriented in the 0° position during calibration.

Certificate number: 20.US2.03808

TRANSCAT CANADA
Trust in every measure

CERTIFICATE OF CALIBRATION

Customer: AERCOUSTICS ENGINEERING LTD
1004 MIDDLEGATE ROAD
SUITE 1100
MISSISSAUGA, ON L4Y 0G1
PO Number: TR2020.07.21

SCC Accredited LAB — LAB Accrédité CCN
SCC Lab No 22
CLAS NRC·CNRC CLAS 2000-03
ilac-MRA

Certificate/SO Number: 9-Q1R3O-20-1 Revision 0

Manufacturer: Nokeval
Model Number: 7470
Description: Serial to Analog Converter
Serial Number: A165152
ID: 00849

As-Found: In Tolerance
As-Left: In Tolerance

Issue Date: Aug 04, 2020
Calibration Date: Aug 04, 2020
Due Date: Aug 04, 2022

Calibrated To: Manufacturer Specification
Calibration Procedure: 1-AC58014-0

Transcat Calibration Laboratories have been audited and found in compliance with ISO/IEC 17025:2017. Accredited calibrations performed within the Lab's Scope of Accreditation are indicated by the presence of the Accrediting Body's Logo and Certificate Number. Any measurements on an accredited calibration not covered by that Lab's Scope of Accreditation are listed in the notes section of the certificate. SCC, NRC, CLAS or ANAB do not guarantee the accuracy of an individual calibration by accredited laboratories.

Transcat calibrations, as applicable, are performed in compliance with the requirements of the Transcat Quality Manual QAC-P01-000, the customer's Purchase Order and/or Quality Agreement requirements, ISO 9001:2015, ANSI/NCSL Z540.1-1994 (R2002) or NQA-1, as applicable. Complete records of work performed are maintained by Transcat and are available for inspection. Laboratory standards used in the performance of this calibration are listed on this certificate.

Transcat documents the traceability of measurements to the SI units through the National Institute of Standards and Technology(NIST), or the National Research Council of Canada (NRC), or other national measurement institutes (NMI) that are signatories to the CIPM Mutual Recognition Arrangement, or accepted fundamental and/or natural physical constants, or by the use of specified methods, consensus standards or ratio type measurements. Documentation supporting traceability information is available for review upon written request at a Transcat facility. The measured quantity and the measurement uncertainty are required for further dissemination of traceability.

A binary decision rule, utilizing simple acceptance, and simple rejection criteria is used for the determination of compliance. When compliance statements are present, they are reported without factoring in the effects of uncertainty and comply with the guidelines established by ASME B89.7.3.1-2001 (R2019) as follows:
-The acceptance zone is defined as: less than or equal to the high limit, and/or greater than or equal to the low limit. The rejection zones are defined as greater than the high limit and/or less than the low limit.
-Single measurement results in the acceptance zone are be identified as in-tolerance. Single measurement results in the rejection zone are identified as out-of-tolerance (OOT).
-When all measurement results are in the acceptance zone for repeated measurements, for the same characteristic, the test is identified as in-tolerance. For repeated characteristic measurements, a single measurement result in the rejection zone, will cause the test to be identified as out-of-tolerance (OOT).

Uncertainties are reported with a coverage factor k=2, providing a level of confidence of approximately 95%. All calibrations have been performed using processes having a TUR of 4:1 or better (3:1 for mass calibrations), unless otherwise noted. The Test Uncertainty Ratio (TUR) is calculated in accordance with NCSL International RP-18. For mass calibrations: Conventional mass referenced to 8.0 g/cm³.

The results in this report relate only to the item calibrated or tested. Recorded calibration data is valid at the time of calibration within the stated uncertainties at the environmental conditions noted. The determination of compliance to the specification is specific to the model/serial no./ID no. referenced above based on the tolerances shown; these tolerances are either the original equipment manufacturers (OEM's) warranted specifications or the client's requested specifications. This certificate may not be reproduced except in full, without the written approval of Transcat. Additional information, if applicable may be included on separate report(s).

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Appendix F.02
Summary of Measurement Results

Summary of Measurement Results

1.1 Sound Power Levels

From Table 11 of IEC test report 16115.01.T12.RP3:

Wind Speed (m/s)	Apparent L_{WA}, (dBA)	Maximum Sound Power Level (dBA)* AAR dated Oct 21, 2019
8	101.3	104.8
8.5	101.8	104.8
9	102.2	104.8
9.5	102.3	104.8
10	102.7	104.8
10.5	102.8	104.8
11	103.2	104.8
11.5	103.5	104.8
12	103.5	104.8
12.5	103.7	104.8

*Includes +0.5 dB, per Section E3.1 of the MOECC Compliance Protocol for Wind Turbine Noise

It is noted that the turbine sound power level was revised down from 105.8 dBA in the approved REA # 0871-AV3TFM to 104.3 dBA in the later AAR. However, the approved REA was not subsequently updated to reflect this change.

The acoustic emission testing indicates that the overall sound power level of the turbine complies with the maximum sound power level permitted in Schedule B of the Nation Rise REA #0871-AV3TFM as well as that of the most recent AAR.

Summed from Appendix C.01 of IEC test report 16115.01.T12.RP3

Wind Speed	Octave Sound Power Level (dBA)								
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
8	76.0	84.3	90.4	92.7	93.6	96.7	94.6	82.5	79.1
8.5	76.0	84.7	91.5	93.1	94.0	97.2	95.3	82.8	79.2
9	76.3	85.0	92.7	93.5	94.3	97.4	95.6	83.8	80.3
9.5	75.7	84.7	92.9	93.5	94.3	97.6	96.0	83.5	79.9
10	75.4	84.4	93.8	93.7	94.6	97.9	96.3	84.1	80.7
10.5	76.1	84.7	93.0	94.0	94.9	98.1	96.4	84.5	81.0
11	76.1	84.5	94.1	94.3	95.2	98.4	96.6	85.0	81.9
11.5	75.2	84.0	93.2	94.5	95.7	98.9	97.2	85.9	82.7
12	75.3	83.5	93.1	94.4	95.9	98.9	97.0	86.7	83.3
12.5	75.1	84.1	93.5	94.5	96.1	99.1	97.0	86.9	83.8

1.2 Tonal Audibility Values

From Table 14 of IEC test report 16115.01.T12.RP3:

Wind Speed (m/s)	Frequency (Hz)	Tonal audibility, ΔL_a (dB)	Tonal Audibility Limit* (dB)
8	No Tones		3
8.5	122	-2.8	3
9	124	-1.6	3
9.5	124	-0.1	3
10	125	1.1	3
10.5	125	-0.4	3
11	126	-0.2	3
11.5	130	0.2	3
12	130	0.7	3
12.5	131	0.7	3

*Nation Rise Wind Farm Renewable Energy Approval Application – Noise Impact Assessment, issued by DNV GL, Doc # 10021027-CAMO-R-06, (Issue F, Dated 31 May, 2019)

1.3 Statement of Compliance

Based on the results in Table 12 of the IEC 61400-11:2012[1] test report to which this statement is attached, the maximum apparent sound power level of the test turbine complies with the sound level in REA # 0871-AV3TFM, the most recent AAR and Section E3.1 of the MECP Compliance Protocol for Wind Turbine Noise.

Based on the results in Table 14 of the IEC 61400-11:2012 to which this statement is attached, the maximum tonal audibility of the test turbine is below the warranty tonal audibility of 3 dB indicated in the statement from the manufacturer in Appendix F of the Noise Impact Assessment Report dated May 31st, 2019.

The maximum measured tonal audibility is also below the 3 dB threshold indicated in Section D3.8.3 of the MECP Compliance Protocol for Wind Turbine Noise. Therefore, the tonal audibility measured in this test does not present a concern regarding tonal audibility at the surrounding receptors.

[1] While the REA specified the use of test standard CSA/CAN-C61400-11-07 for the Emission Audit, the IEC:61400:2012 test standard was used. IEC:61400:2012 is equivalent to the CSA/CAN-IEC 61400-11:13 standard. Per Section A4.4.3 of the compliance protocol, CSA/CAN-IEC 61400-11:13 is an acceptable standard for Emission Audit.

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Appendix F.03
E-Audit Checklist

Appendix F.03 - (2017 Compliance Protocol Appendix F6): E-Audit checklist for IEC 61400-11:2013

Wind Energy Project – Screening Document – Acoustic Audit Report – Emission IEC61400-11:2013 Standard

Information Required in the Acoustic Audit Report – Emission

Item #	Description	Complete?	Comment
1	Characterization of the wind turbine Items 1 to 26; IEC61400-11:2013, Section 10.2	✓	Report Section 2.1
2	Physical environment Items 27 to 33; IEC61400-11:2013, Section 10.3, Physical Environment	✓	Report Section 2.2, 3.2, 4.2, Appendix A
3	Measurement instrumentation Items 34 to 39; IEC61400-11:2013, Section 10.4, Instrumentation	✓	Report Section 3, Appendix F.01
4	Acoustic data Items 40 to 52; IEC61400-11:2013, Section 10.5, Acoustic Data	✓	Report Section 4, 3.3, Appendix C, Appendix D,
5	Non-acoustic data Items 50 to 53, and 56; IEC61400-11:2003 Section 10.6, Non-Acoustic Data Items 59 and 60; NPC-233, Section 12.3, Acoustic Audit – Acoustical Data, bullet point number 8, All necessary and supporting calculations	✓	Report Section 3, Appendix E
6	Uncertainty the apparent sound power level at integer wind speeds one-third octave band spectrum of the noise at the reference position at each integer wind speed the Tonality of the sound emissions of the wind turbine measured at the reference position	✓	Report Section 4, Appendix C
7	Additional information Item 60; NPC-233, Section 10, Report Format, bullet point number 4, Conclusions and Recommendations Item 61; NPC-233, Section 12.3, Acoustic Audit – Acoustical Data, bullet point number 8, All necessary and supporting calculations Item 62; NPC-233, Section 12.3, Acoustic Audit – Acoustical Data, bullet point number 3, Details of measurement procedure	✓	Report Section 3, Appendix F, data in Excel provided separately
8	Items 68 to 72; IEC61400-11:2013, Section 10.5, Acoustic Data	⦸	Optional information, not provided in this report
9	Non-acoustic data Items 73 to 74 are from IEC61400-11:2013, Section 10.6, Non-Acoustic Data	⦸	Optional information, not provided in this report

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Mississauga, ON L4Y 0G1

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aercoustics.com

Appendix F.04
Additional Details Regarding Microphone Location

Adjustment of Microphone Location R_0 from Nominal Location

The microphone board was placed at a distance of 212 m from the Turbine T12 tower centreline in a downwind location with a reference yaw position of 277 degrees with respect to magnetic north (roughly 263 degrees with respect to true north). This represents a microphone position 12 m further than the nominal microphone distance of 200 m – an adjustment of +6%.

The microphone was placed further away from Turbine T12 in order to avoid placing the microphone in a large puddle encountered at the nominal microphone location. The final placement is in accordance with the requirements of Section 7.1 of the IEC 61400-11 Edition 3.0 standard. Specifically, the chosen microphone location is within the +/- 20% tolerance (up to a maximum of 30 m) of the nominal microphone location.

The UTM coordinates of the microphone location that was utilized for the testing are 484468 m E, 5004106 m N, Zone 18T as taken from Google Earth.

This adjustment from the nominal location microphone was accounted for; the Slant Distance R_1 used in Equation 27 of the IEC 6140-11 Edition 3.0 standard uses an R_0 value of 212 m. The additional atmospheric absorption associated with this 12 m adjustment is negligible.

A photo has been included below (Figure F.04-1) which illustrates the puddle encountered on site, as well as an aerial image (Figure F.04-2) illustrating the location of the puddle and the final microphone location.

Figure F.04-1: Pooled Water at 200 m from Turbine T12 (pictured in distance)

* 277 degrees w.r.t Magnetic North = Approx 263 degrees w.r.t. True North

aercoustics	16115.01.T12.RP3 Scale: NTS Drawn by: KC Reviewed by: DH Date: Jul 2022 Revision: 1	**Project Name** Nation Rise Wind Farm - IEC 61400-11 Edition 3.0 - Turbine T12 **Figure Title** Illustration of Microphone Location and Puddle **Figure F.04-2**

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End of Report