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REPORT ID: **13259.00.T24.RP3**

Summerhaven Wind Energy Centre – Turbine T24
IEC 61400-11 Edition 3.0 Measurement Report

Prepared for:

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Revision History

Revision Number	Description	Date
1	Issued Edition 3.0 test report	November 20, 2013
2	Issued Edition 2.1 test report	March 26, 2015
3	Issued revised Edition 3.0 test [13 and 13.5m/s wind bins]	November 07, 2017

This report in its entirety, including appendices contains 88 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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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 NextEra Energy Canada ("NextEra") to conduct an acoustic measurement of turbine T24 at the Summerhaven Wind Energy Centre. The purpose of the measurement was to provide verification of the maximum noise emission of the turbine. The measurement was carried out 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 Turbine T24.

2 Wind Turbine Information

2.1 Wind turbine equipment specific information

Wind turbine specific equipment information for turbine T24 was provided by NextEra and is summarized in Tables 1 – 5.

Table 1 - Wind Turbine Details

Wind Turbine Details	
Manufacturer	Siemens
Model Number	2.3
Turbine ID	2306899

Table 2 - Operating Details

Operating Details	
Vertical or Horizontal axis wind turbine	Horizontal
Upwind or downwind rotor	Upwind
Hub height	80m
Horizontal distance from rotor centre to tower axis	3500mm
Diameter of rotor	9.3m
Tower type (lattice or tube)	Tube
Passive stall, active stall, or pitch controlled turbine	Pitch controlled
Constant or variable speed	Variable
Power curve	See Figure B.01
Rotational speed at each integer standardised wind speed	See Figure B.02 from measurement data
Rated power output	2221kW
Control software version	12.12.03

Table 3 - Rotor Details

Rotor Details	
Rotor control devices	Hydraulically actuated full span pitch system
Presence of vortex generators, stall strips, serrated trailing edges	Vortex Generator and Dino Tail
Blade type	Siemens Blade B45
Serial number	Set 2774, 450771802, 451156102, 450772302
Number of blades	3

Table 4 - Gearbox Details

Gearbox Details	
Manufacturer	Winergy
Model number	PEAB4456,6
Serial number	4832972-020-6

Table 5 - Generator Details

Generator Details	
Manufacturer	ABB
Model number	ABB C3 2300kW VS 690v
Serial number	4607851

2.2 Wind Turbine Location

Turbine T24 is located in the municipality Nanticoke, in Haldimand County, approximately 600m south of Concession Road 5 and 3,000m west of Regional Road 53. The area surrounding T24 is flat and consists primarily of farmland.

A general layout of the area in which the turbine is located is provided in the site plan (Figure A.01).

3 Measurement Details

3.1 Measurement Equipment

3.1.1 Acoustic Measurement Equipment

A summary of acoustic equipment utilized by Aercoustics for the measurement of turbine T24 is summarized in Table 6.

Table 6 - Acoustic Measurement Equipment

Equipment	Manufacturer Name & Model	Serial Number
Acoustic Data acquisition system	LMS SCADA Mobile	53103922
Microphone	B&K 4189	2625416
Pre-amplifier	B&K 2671	2369794
Acoustic calibrator	B&K 4231	2513182

Calibration of the measurement setup was carried out before and after Aercoustics set of measurements.

3.1.2 Meteorological Equipment

Wind speed for Turbine ON was derived from the power curve (as per procedures outlined in IEC 61400-11). Wind direction for turbine ON measurements was utilized from the yaw position from turbine T24. Data for background measurements was obtained from a 10m high anemometer, which was placed as per guidelines outlined in IEC-61400-11.

The meteorological equipment is summarized in Table 7

Table 7 – Meteorological Measurement Equipment

Equipment	Manufacturer Name & Model	Serial Number
Anemometer	VAISALA WXT520	G4420002
Serial to Analog Converter	NOKEVAL 7470	19474

3.2 Measurement Setup

3.2.1 Microphone Placement

The measurement microphone was setup 126m from the base of the turbine in ‘Position 1’, (i.e. downwind of the turbine, as per IEC 61400-11) at an elevation of 0m relative to the base of T24. The microphone was placed in the centre of a circular, acoustically reflective board.

During the measurement period only data points for which the microphone was within 15 degrees of downwind from the turbine were used. The microphone position relative to downwind of the turbine was monitoring via the yaw angle output provided from the turbine

system (discussed further in Section 3.5). During placement of the microphone the turbine was parked and the reference yaw angle for that measurement logged.

When measurements of T24 were taken, the surrounding land was a mix of soil and small vegetation. The influence on the measurement was considered negligible. There were no nearby reflecting surfaces (houses, barns etc.); as such the influence from reflecting surfaces was considered to be negligible.

Photos of the measurement setup are provided in Figure A.02, Appendix A.

3.2.2 Double Windscreen Setup

A double windscreen setup was utilized. Documentation of how the secondary windscreen affects the overall sound pressure level and 1/3 Octave Band spectrum in comparison to a single windscreen setup is provided in Appendix C.

The secondary windscreen used meets the performance criterion specified in Annex E (Characterization of a secondary wind screen) of IEC-61400-11:2012.

3.3 Measurement Schedule

Table 8 provides a summary of the test date and times. Data was logged in 10 second intervals for post-processing (as per the measurement standard).

Table 8 - Measurement Schedule Summary

Date	Test Type	Start Time	Finish time
October 20, 2013	Turbine ON	10:06	10:50
	Turbine ON	12:25	12:46
	Background	15:12	15:44
	Turbine ON	17:08	17:44
October 21, 2013	Turbine ON	10:39	10:52
	Turbine ON	10:55	11:36
	Background	11:50	12:20

3.4 Meteorological Conditions

Detailed meteorological data relevant to the measurement is provided in Appendix E.

As previously mentioned, wind speed for Turbine ON was derived from T24's power curve (as per the standard), while wind direction was provided by T24's yaw position. Background data was obtained from an anemometer located 10m above ground level near T24.

Temperature and pressure readings during the measurement period were provided by the 10m anemometer, located near turbine T24 for the duration of Aercoustics measurements.

3.5 Turbine operational information

Output data from the turbine (Power, yaw, RPM, pitch angle, and nacelle wind speed) were obtained as analog output signals that were simultaneously acquired with the acoustic and anemometer measurement data using Aercoustics data acquisition system.

4 Measurement Results

4.1 Deviations from IEC-61400-11 Edition 3.0

No deviations.

4.2 Special Notes & Considerations

There were no other turbines in the immediate vicinity of T24.

4.3 Analysis Details

The following section outlines analysis of the measurement data acquired for T24. The data presented is exclusive of transient events such as vehicle traffic, wildlife, air traffic etc. The site has been assessed to have a roughness length of 0.05m, representative of farmland with some vegetation.

4.3.1 Double Windscreen Adjustment

As previously mentioned, a double wind screen was used, as such; the measurement data was adjusted to account for its influence. All 1/3 Octave Band spectrum and overall level data presented in this report includes the adjustment for the influence of the secondary windscreen.

FFT spectral data used for the tonality assessment was not adjusted. However, it should be noted that the effect of the windscreen on the tonality assessment is considered to be negligible.

4.3.2 Wind Speed Correction

The wind speed for each measurement data point for Turbine ON was derived through the power curve (as per Section 8.2.1.1 of IEC-61400-11). For data points during Turbine ON that were outside the allowed range of the power curve, the wind speed was derived from the nacelle anemometer wind speed (as specified in Section 8.2.1.2 of IEC-61400-11).

Background wind speed was derived utilizing data acquired with the 10m anemometer and normalizing the wind speed (as per Section 8.2.2 of IEC-61400-11).

4.4 Type B uncertainties

Type B uncertainties were obtained through interpretation of information provided in Annex C of IEC-61400-11, and instrument uncertainties obtained from the calibration certificate. A summary of Type B uncertainties is provided in Table 9, while detailed information (including data in 1/3 octave) is provided in Appendix C.

Table 9 - 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

4.5 Sound Pressure Level Measurements

Sound pressure level measurements are summarized in Table 10. Detailed 1/3 Octave band spectrum data, respective uncertainties, and analysis plots are provided in Appendix C. A copy of the measurement data used for analysis is provided in Appendix E and includes meteorological and turbine operational data.

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	54.5	25	46.1	22	53.9
8.5	55.1	31	47.3	20	54.4
9	55.5	43	48.2	17	54.7
9.5	56.3	28	48.7	35	55.5
10	56.9	20	49.1	24	56.2
10.5	57.2	13	50.5	31	56.2
11	57.4	30	49.5	24	56.7
11.5	57.5	25	49.8	26	56.7
12	57.5	37	50.6	21	56.5
12.5	57.6	36	49.9	19	56.8
13	57.8	19	50.9	15	56.8
13.5	58.0	23	50.1	11	57.2

4.6 Sound Power Level of Turbine

The calculated sound power level of the turbine T24 (as per IEC 61400-11) is summarized in Table 11 (hub height) and Table 12 (10m height). Detailed 1/3 Octave band spectrum data and respective uncertainties are provided in Appendix C.

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

Wind Speed (m/s)	Apparent L_{WA}, (dBA)	Uncertainty (dB)
8	102.4	0.8
8.5	102.9	0.9
9	103.2	0.9
9.5	104.0	0.9
10	104.7	0.8
10.5	104.8	0.9
11	105.2	0.9
11.5	105.2	0.9
12	105.0	0.9
12.5	105.4	0.9
13	105.3	1.0
13.5	105.8	0.9

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

Wind Speed (m/s)	Apparent L_{WA}, (dBA)	Uncertainty (dB)
5	99.4	0.8
6	102.7	0.9
7	104.1	0.9
8	105.1	0.9
9	105.2	0.9
10	105.5	0.9

4.7 Tonality Analysis

The tonality analysis for Turbine T24 is summarized in Table 13, while plots of narrow band spectra at each wind speed are provided in Appendix D. The ΔL_{tn} and ΔL_a values reported represent the energy average of all data points with an identified tone that falls within the same frequency origin (as specified in Section 9.5.8 in IEC-61400-11).

The narrow band spectra provided in the plots represents an energy average of all data points in the given wind speed bin for both Turbine ON and Background.

Table 13 - Tonality Assessment Summary

Wind Speed (m/s)	Frequency (Hz)	Tonality, ΔL_{tn} (dB)	Tonal audibility, ΔL_a (dB)	FFT's with tones	Total # of FFT's	Presence (%)
8	531	-4.9	-2.6	25	25	100%
8.5	524	-2.3	0.0	31	31	100%
9	520	-1.0	1.3	43	43	100%
9.5	60	-3.4	-1.4	15	28	54%
	513	-0.3	2.0	20	28	71%
10	122	-2.7	-0.7	14	20	70%
	511	0.3	2.6	16	20	80%
10.5	519	0.7	3.0	13	13	100%
11	124	-3.3	-1.3	28	30	93%
	512	1.5	3.8	30	30	100%
11.5	124	-3.2	-1.2	24	25	96%
	514	2.4	4.7	24	25	96%
12	124	-2.2	-0.2	36	37	97%
	513	2.5	4.9	34	37	92%
12.5	124	-2.6	-0.6	36	36	100%
	516	2.5	4.8	35	36	97%
13	124	-3.6	-1.6	19	19	100%
	515	2.8	5.1	19	19	100%
13.5	124	-2.6	-0.5	23	23	100%
	517	2.0	4.4	23	23	100%

5 Closure

Measurements and analysis were carried on Turbine T24 of the Summerhaven Wind Energy Centre as per International IEC 61400-11 (Edition 3.0, released 2012-11), "Wind turbine generator systems – Part 11: Acoustic noise measurement techniques".

Should you have any questions or comments please do not hesitate to contact the authors of this report.

6 References

1. International Standard IEC 61400-11 (Edition 3.0, released 2012-11), "Wind turbine generator systems – Part 11: Acoustic noise measurement techniques".

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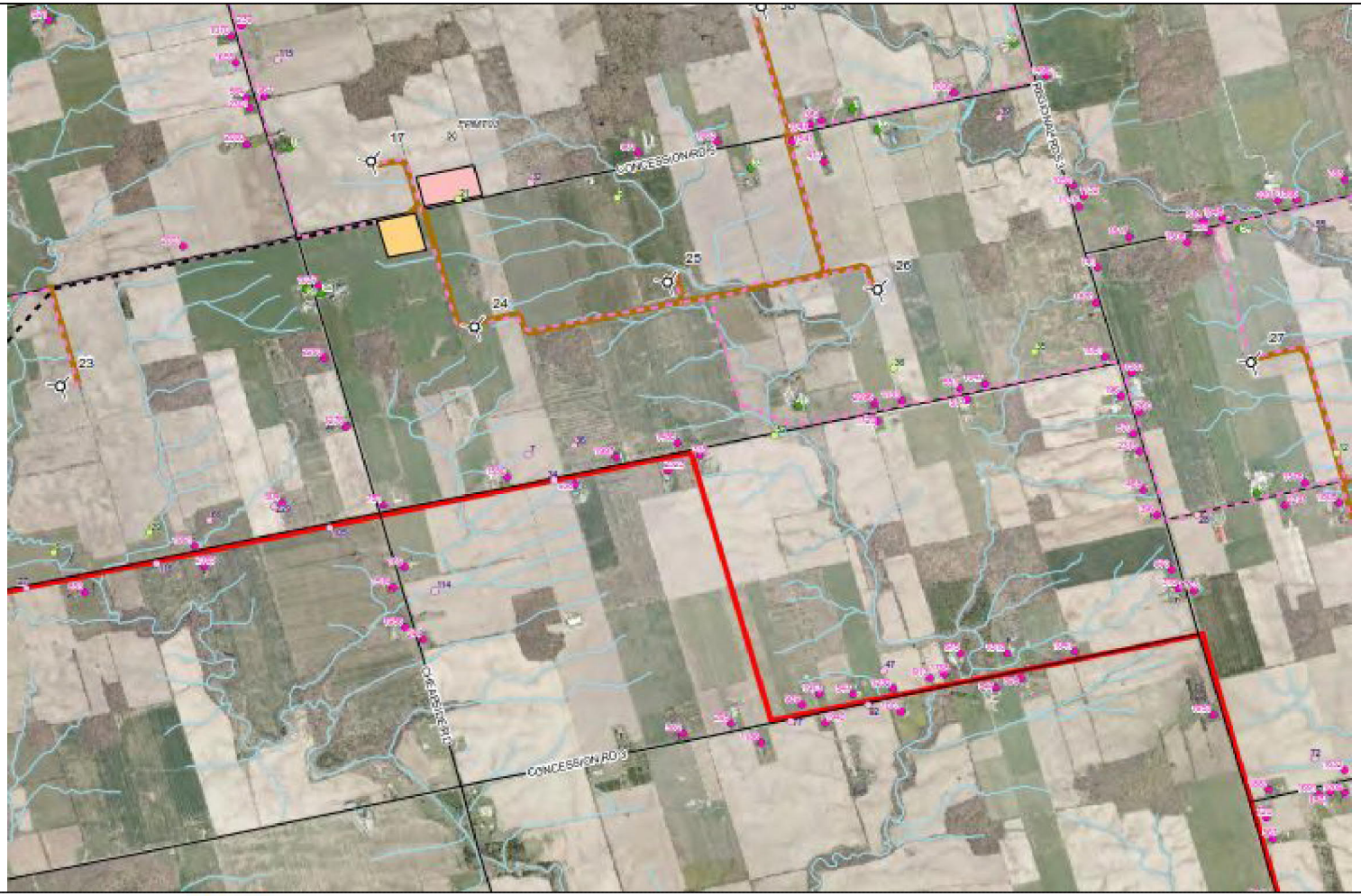
Appendix A
Site Details



LEGEND

- Turbine Location
- Point of Reception
- Participating Receptor
- Vacant Point of Reception
- Vacant Participating Receptor
- Meteorological Tower
- Cable
- Transmission Line
- Project Area
- Substation
- Office
- Point Of Interconnect\Switchyard
- Access Road
- Community
- Hydro One Transmission Line
- Highway
- Regional Road
- Local Road
- Watercourse
- Wetland
- Waterbody

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Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0
	Figure Title Site Plan

Figure A.01

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	Figure Title Site Photos

Figure A.02

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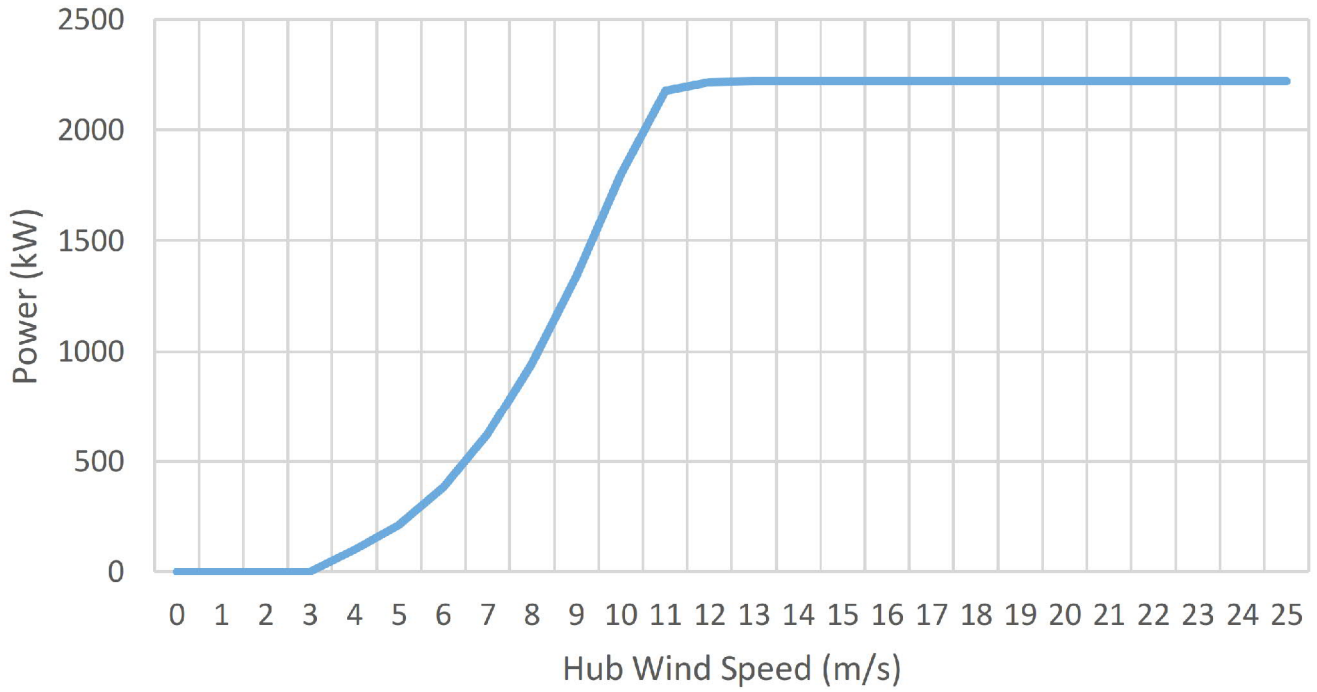
Appendix B
Turbine Information



Power Curve	
Hub Wind Speed (m/s)	Power [kW]
0	**0**
1	0
2	0
3	0
4	98
5	212
6	385
7	625
8	941
9	1344
10	1803
11	2177
12	2219
13	2220
14	2221
15	2221
16	2221
17	2221
18	2221
19	2221
20	2221
21	2221
22	2221
23	2221
24	2221
25	2221

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Revision: 1

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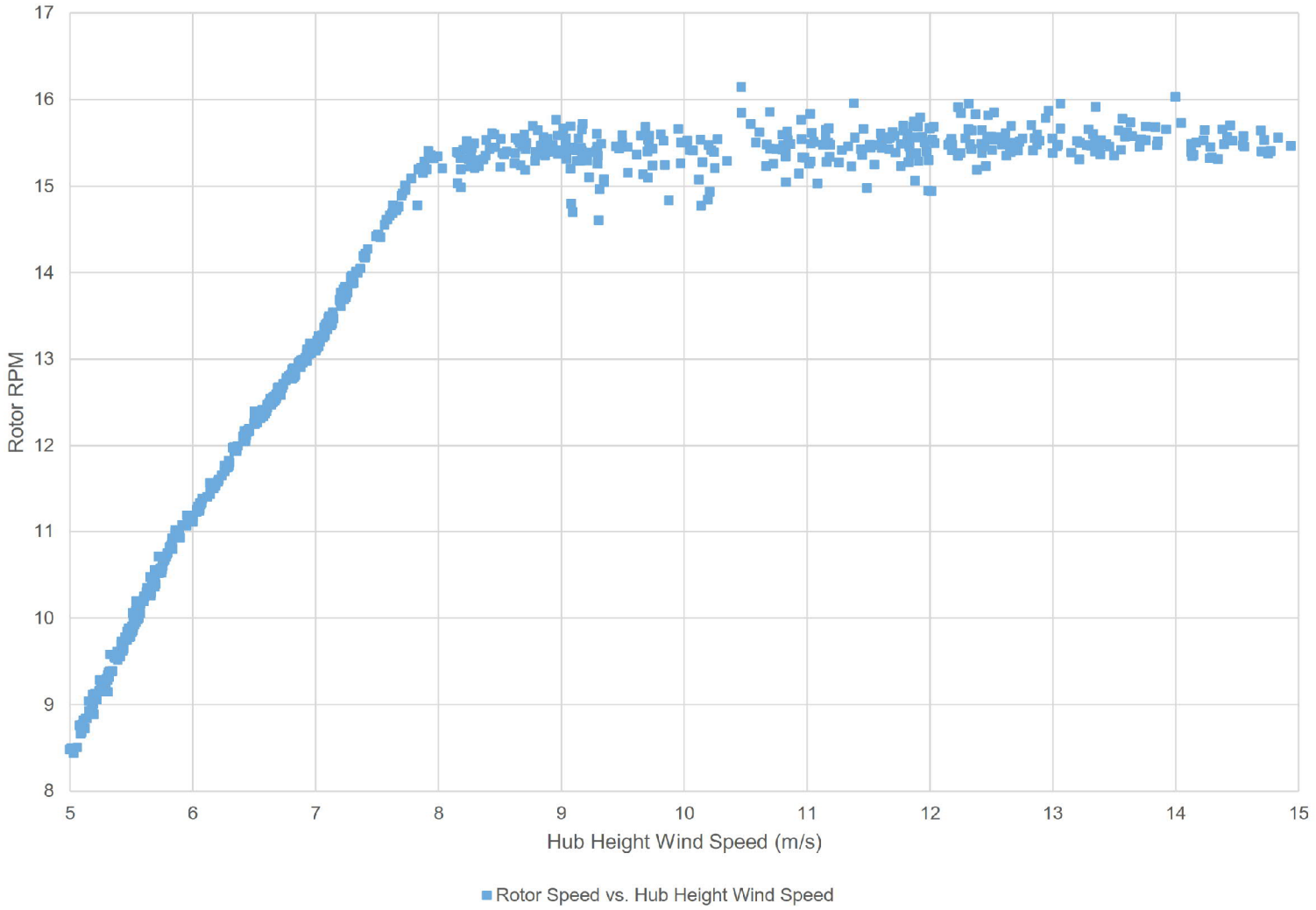
Figure Title

Power Curve

Figure B.01



aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Rotor RPM vs. wind speed

Figure B.02

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Appendix C
Apparent Sound Power Level

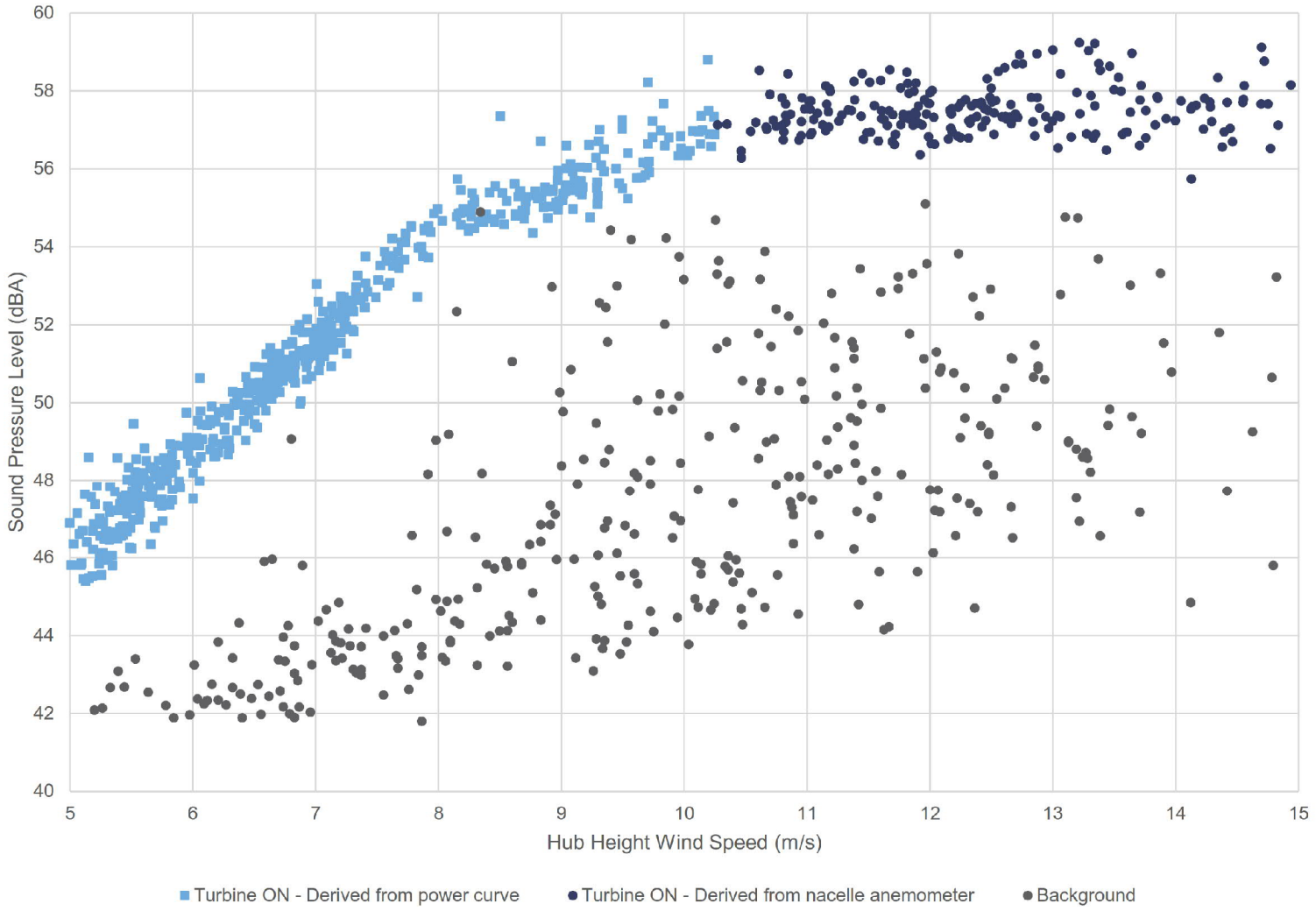

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Figure C.01

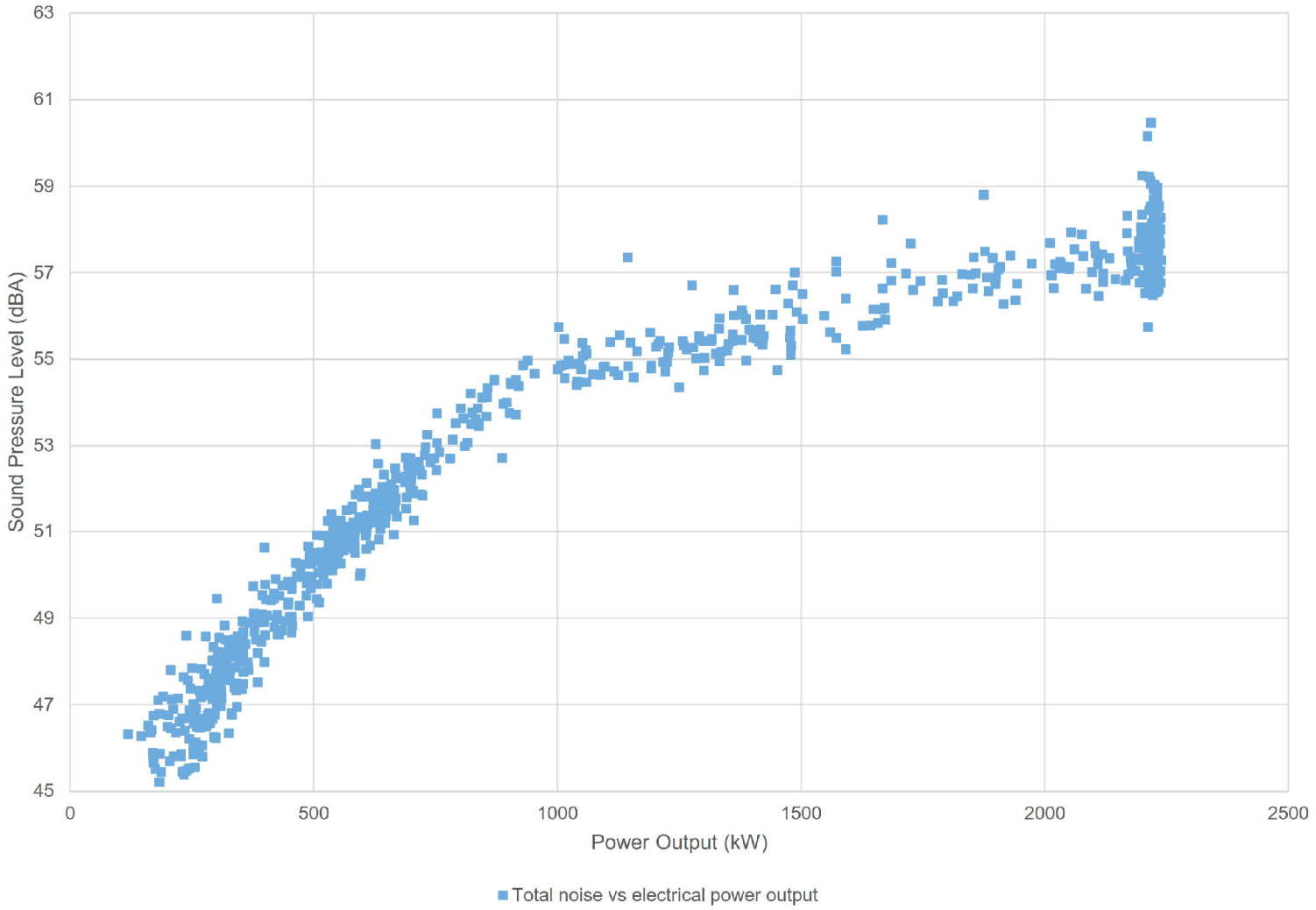

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Figure C.02

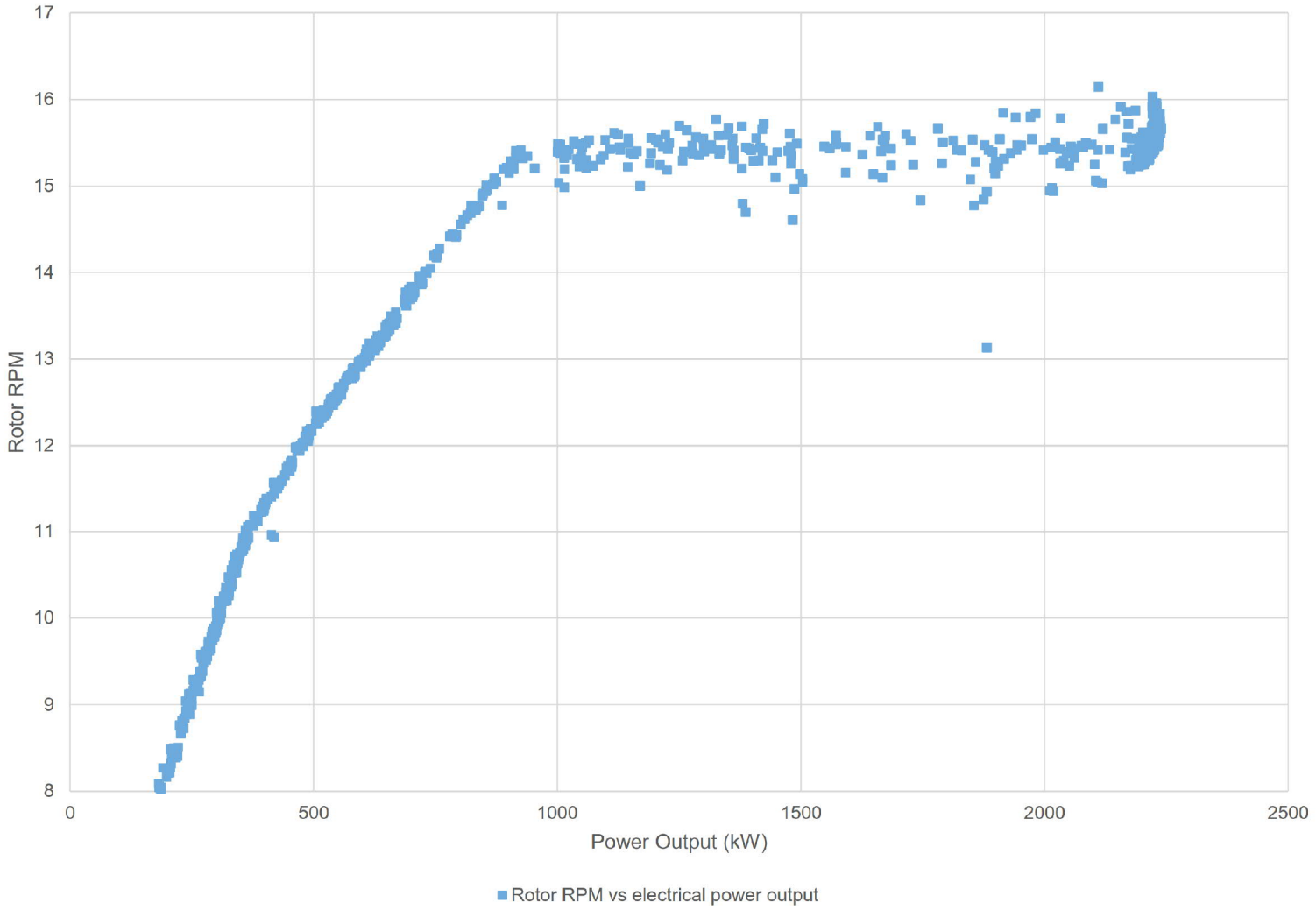

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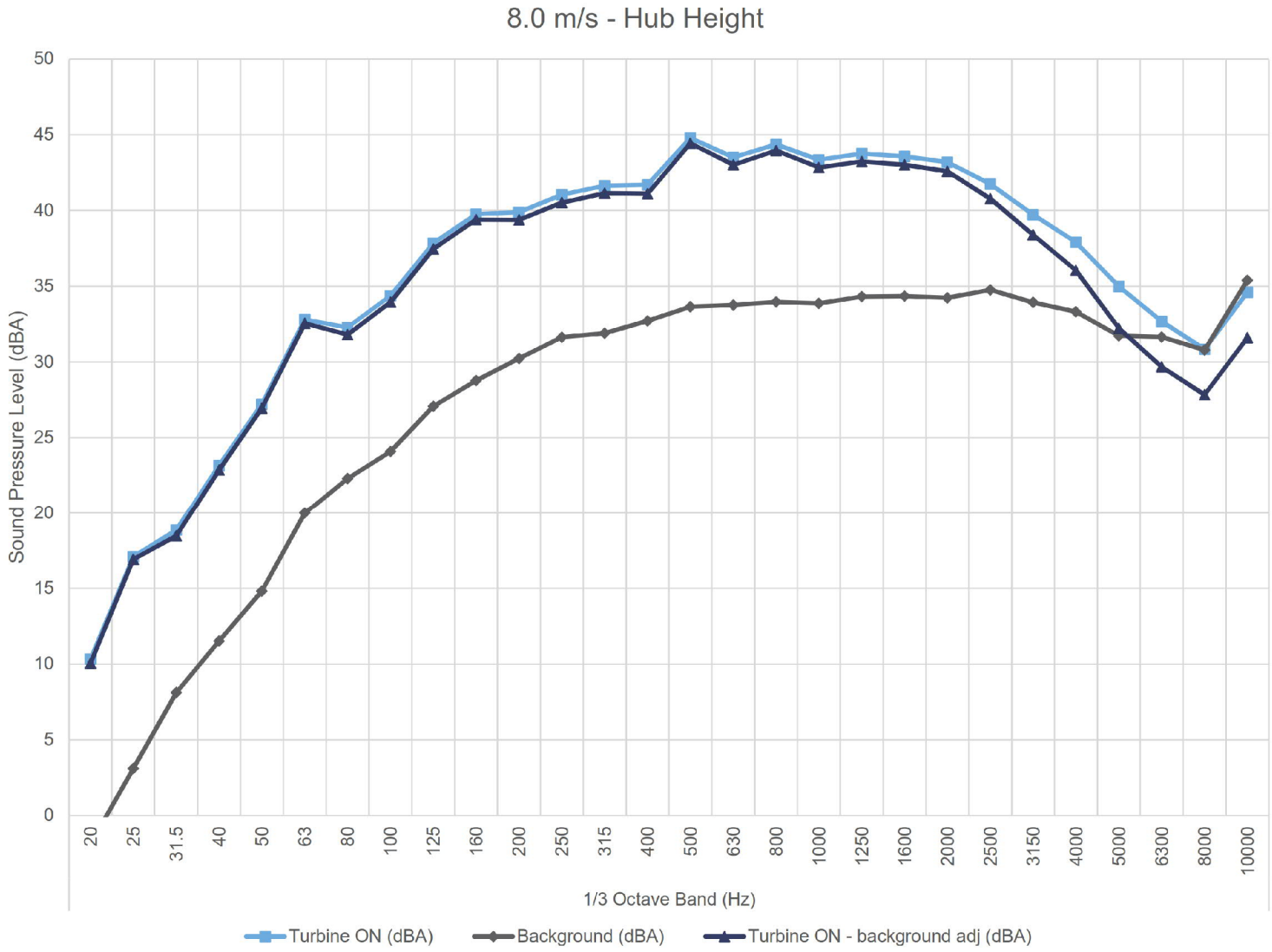
Figure C.04



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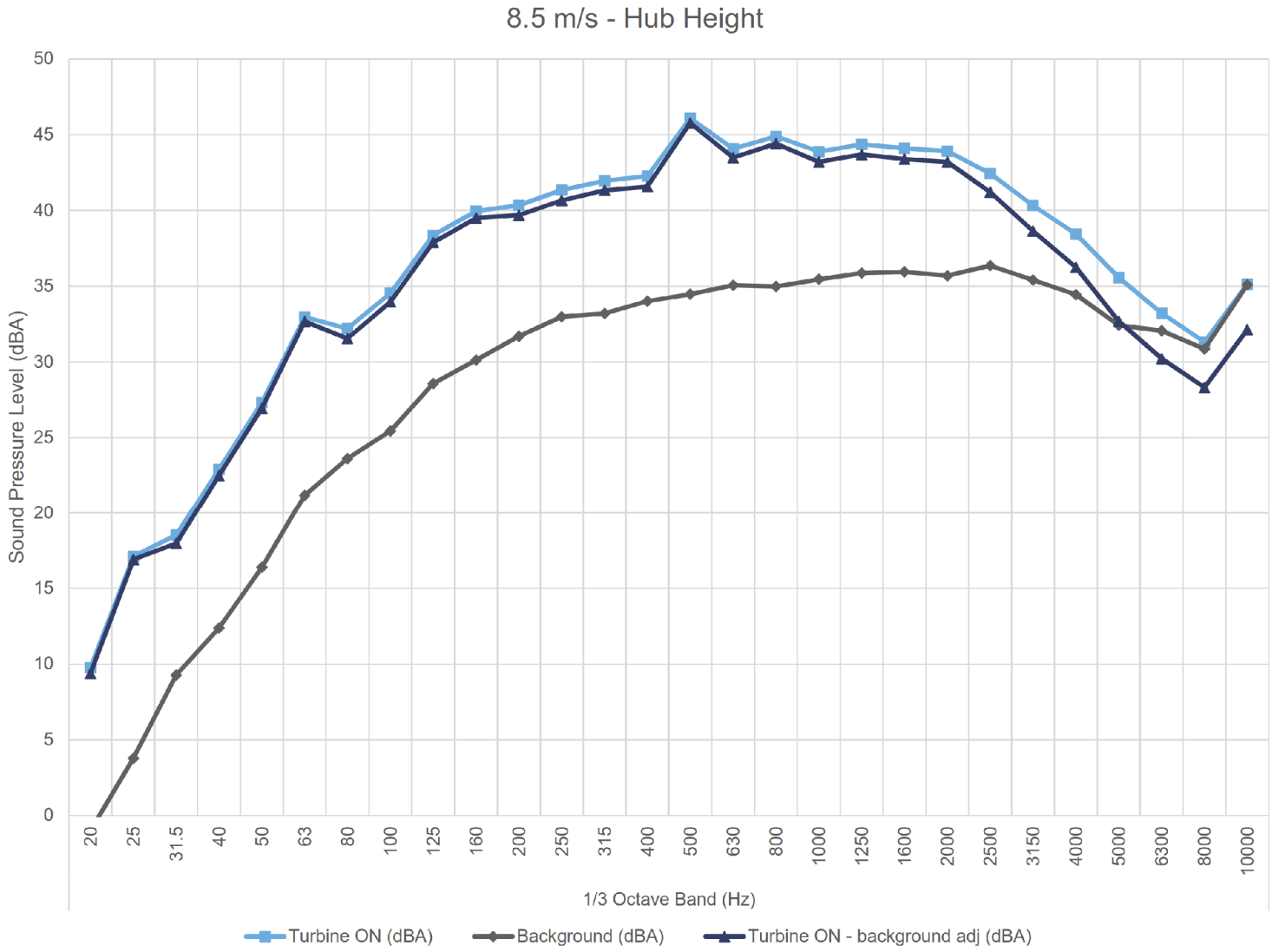
Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0
	Figure Title Plot of sound pressure spectrum in 1/3 Octave at 8 m/s

Figure C.05



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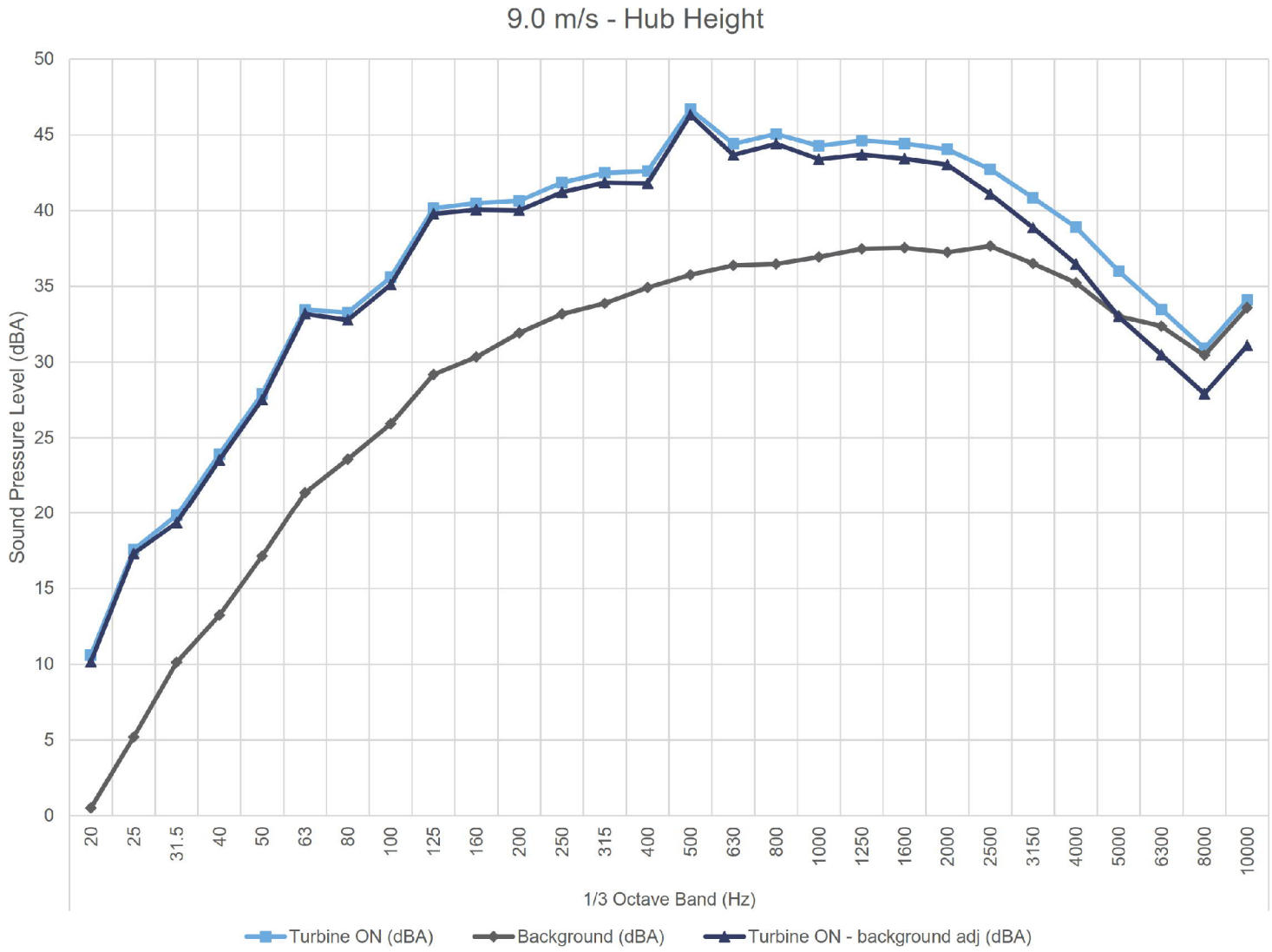
Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0
	Figure Title Plot of sound pressure spectrum in 1/3 Octave at 8.5 m/s

Figure C.06



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Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0
	Figure Title Plot of sound pressure spectrum in 1/3 Octave at 9 m/s

Figure C.07

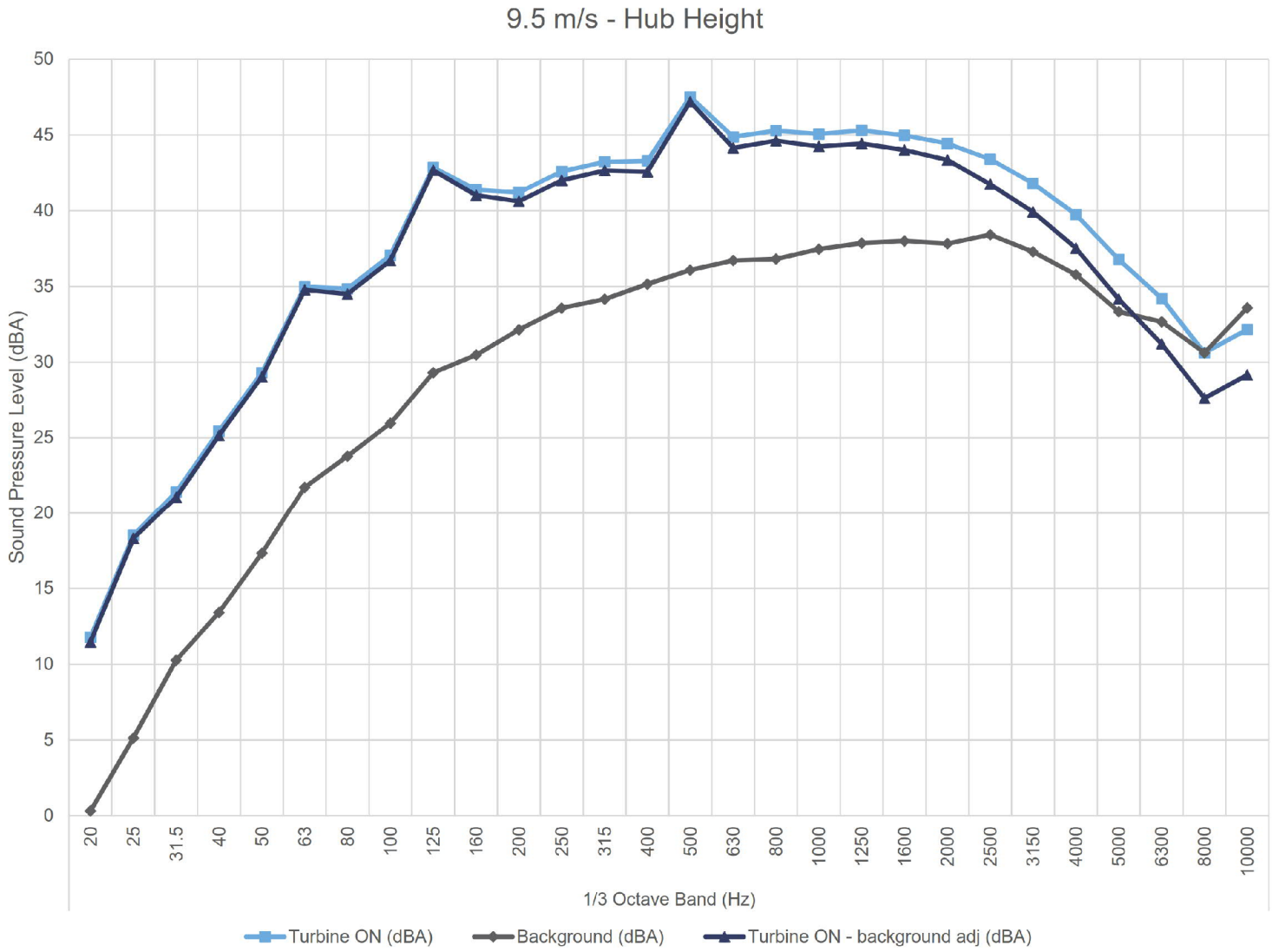

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Figure C.08

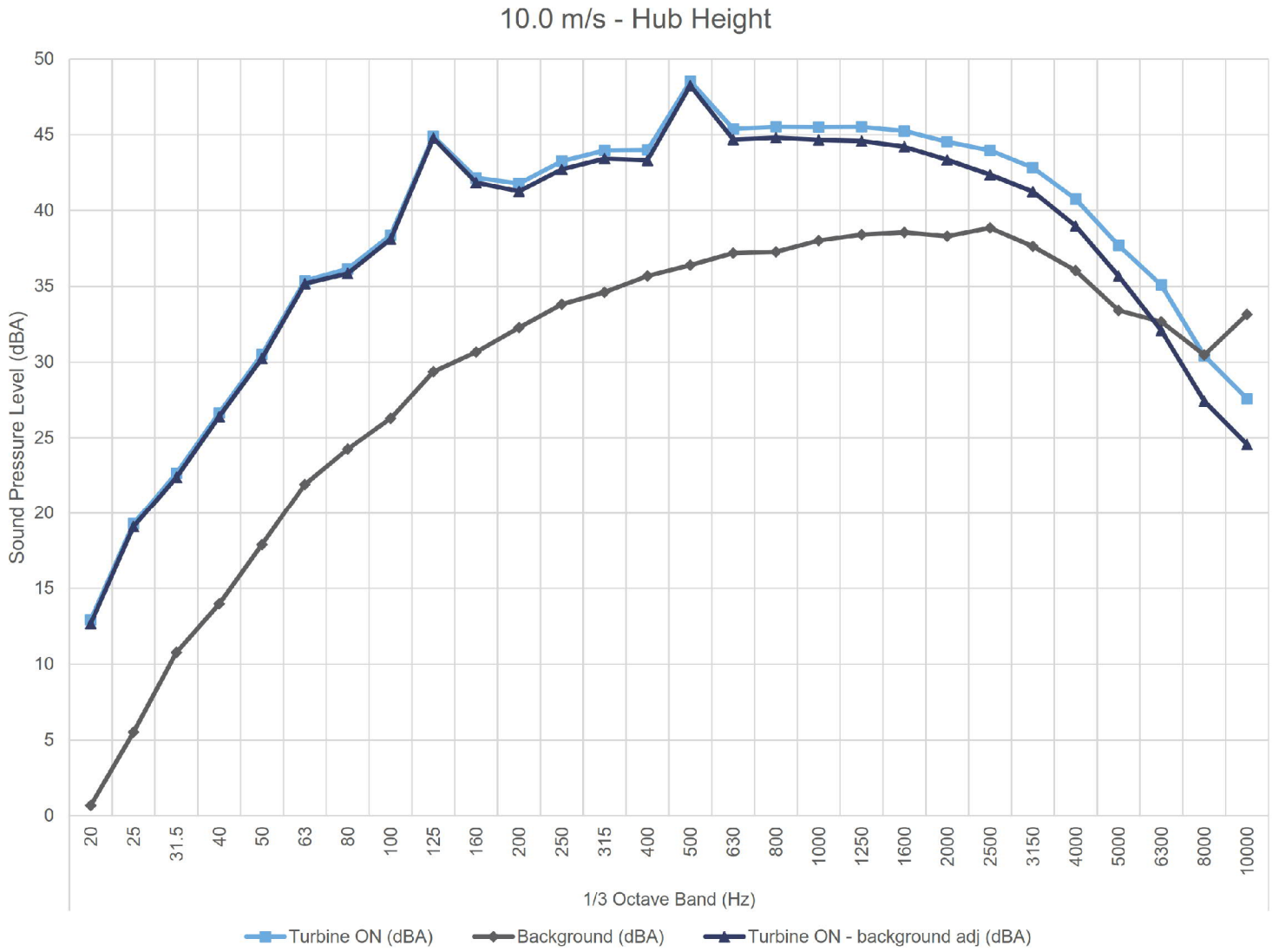

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Figure C.09

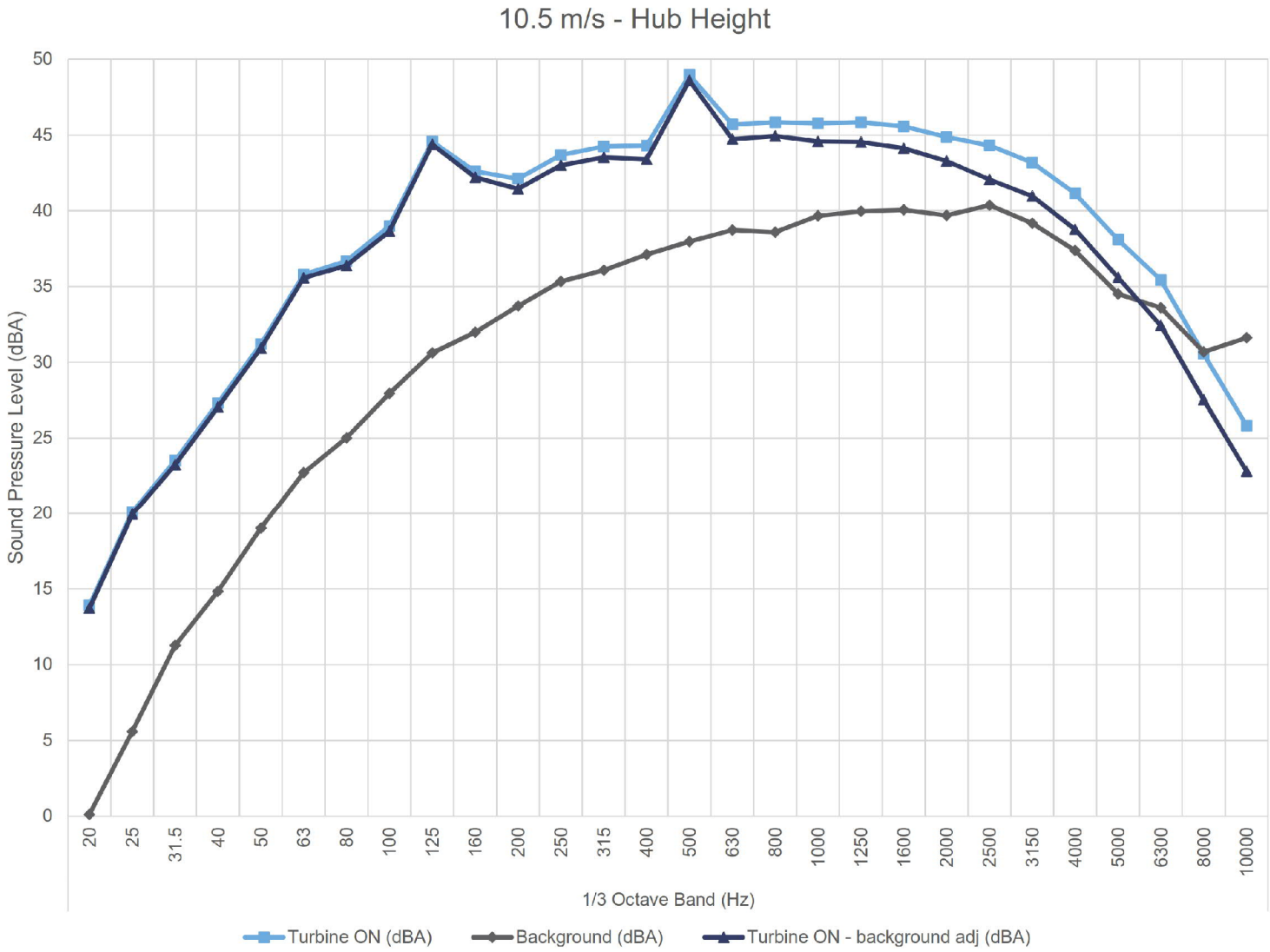

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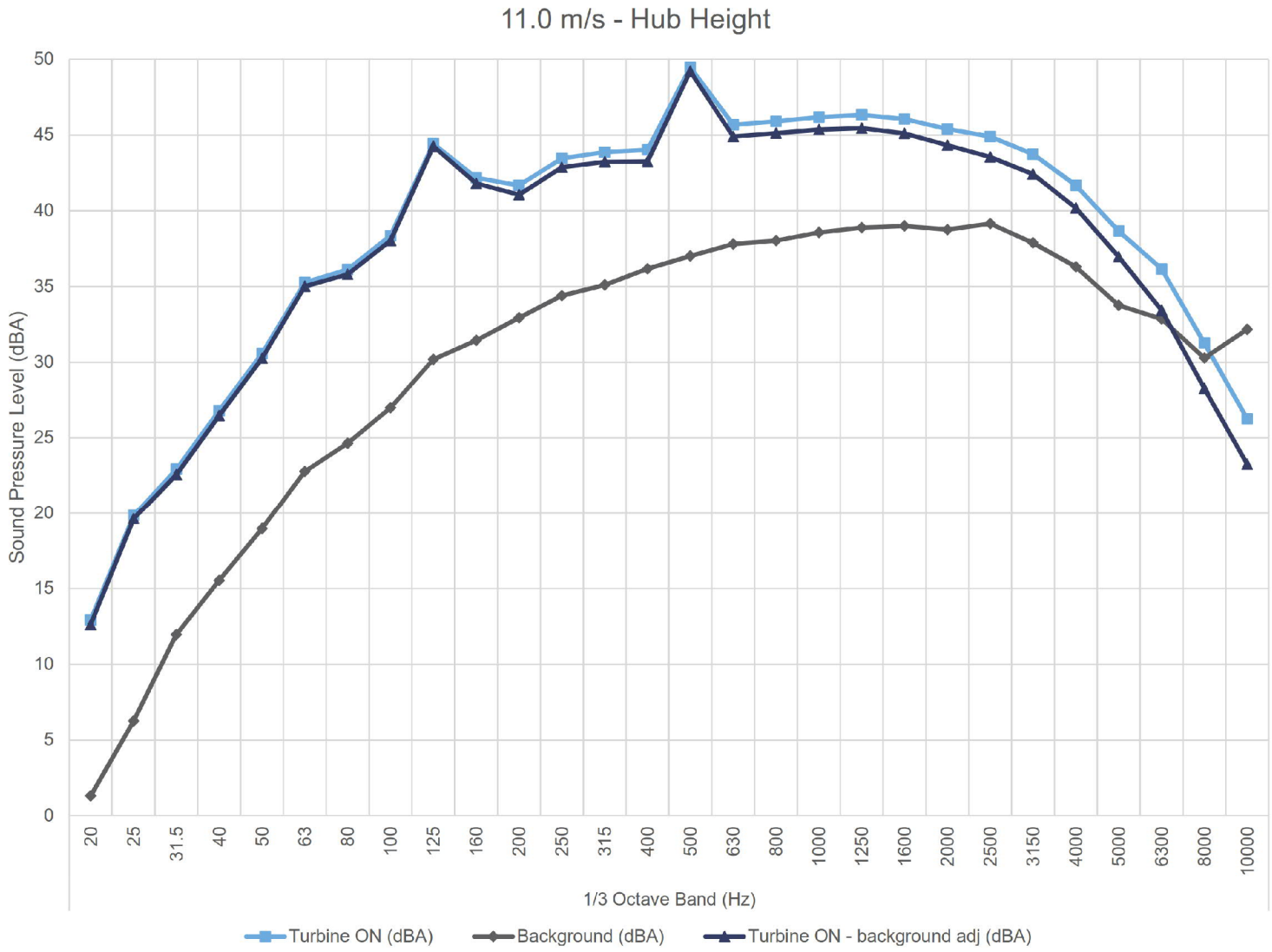
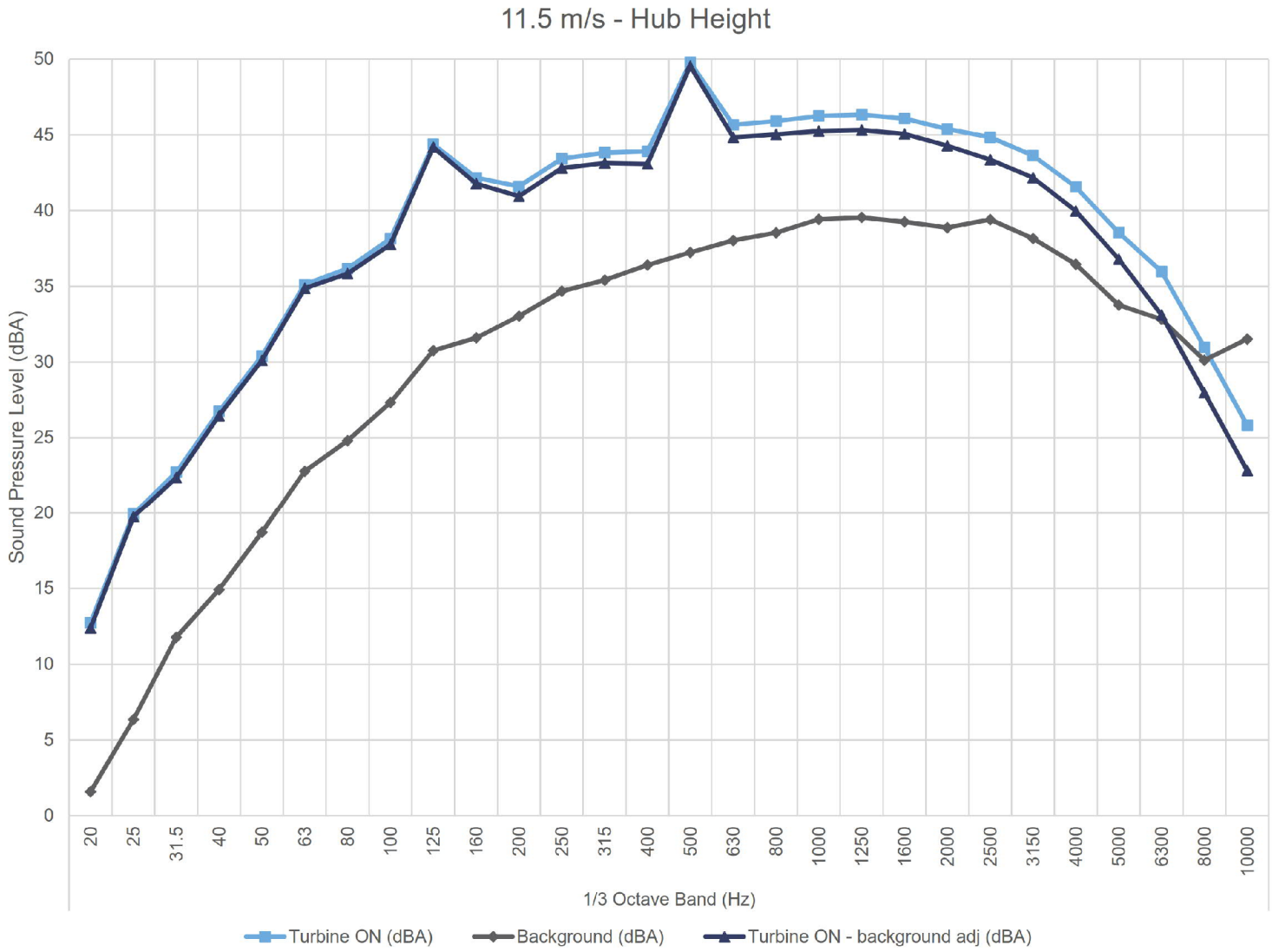
Figure C.10



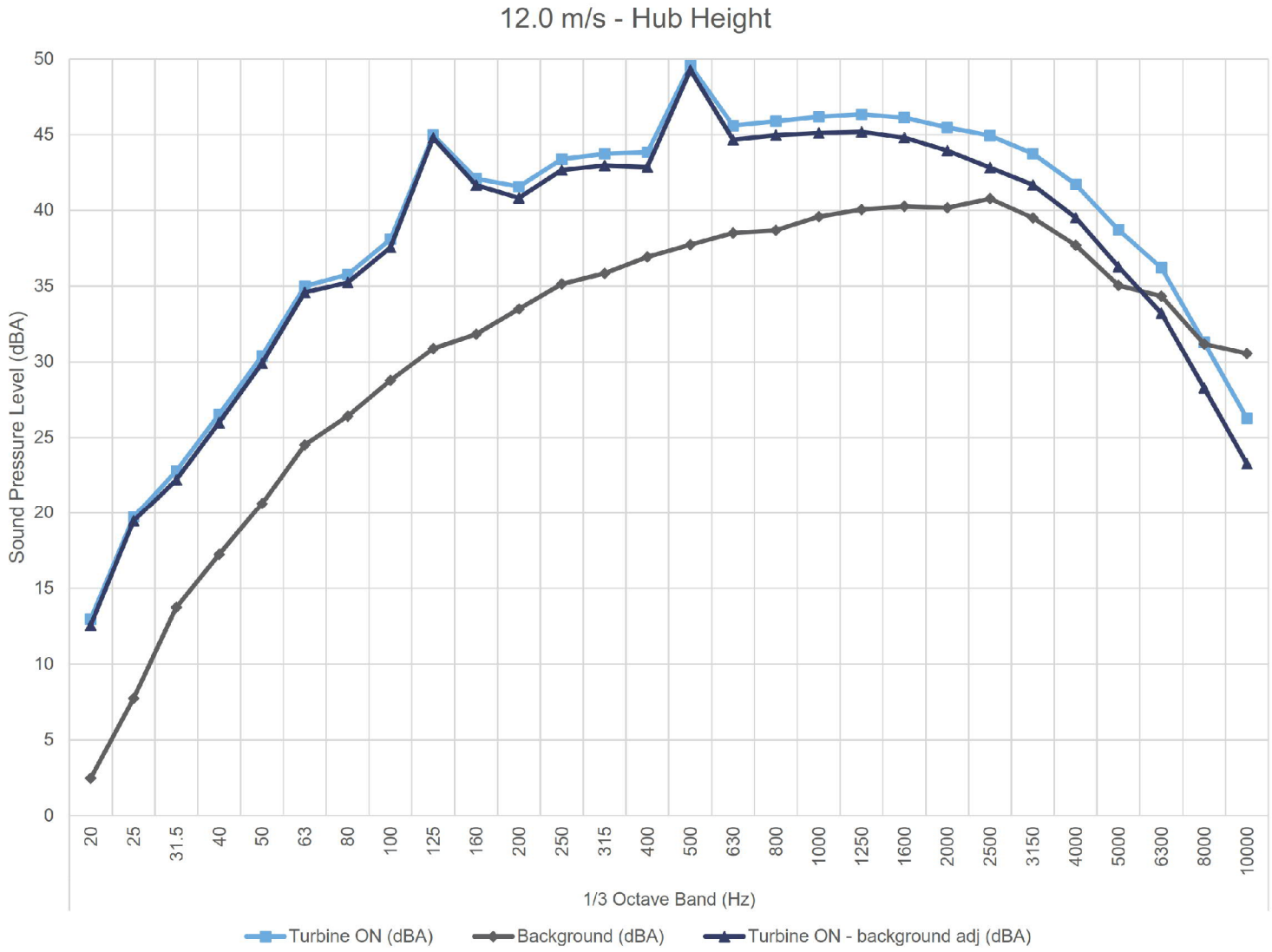
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum in 1/3 Octave at 11 m/s

Figure C.11



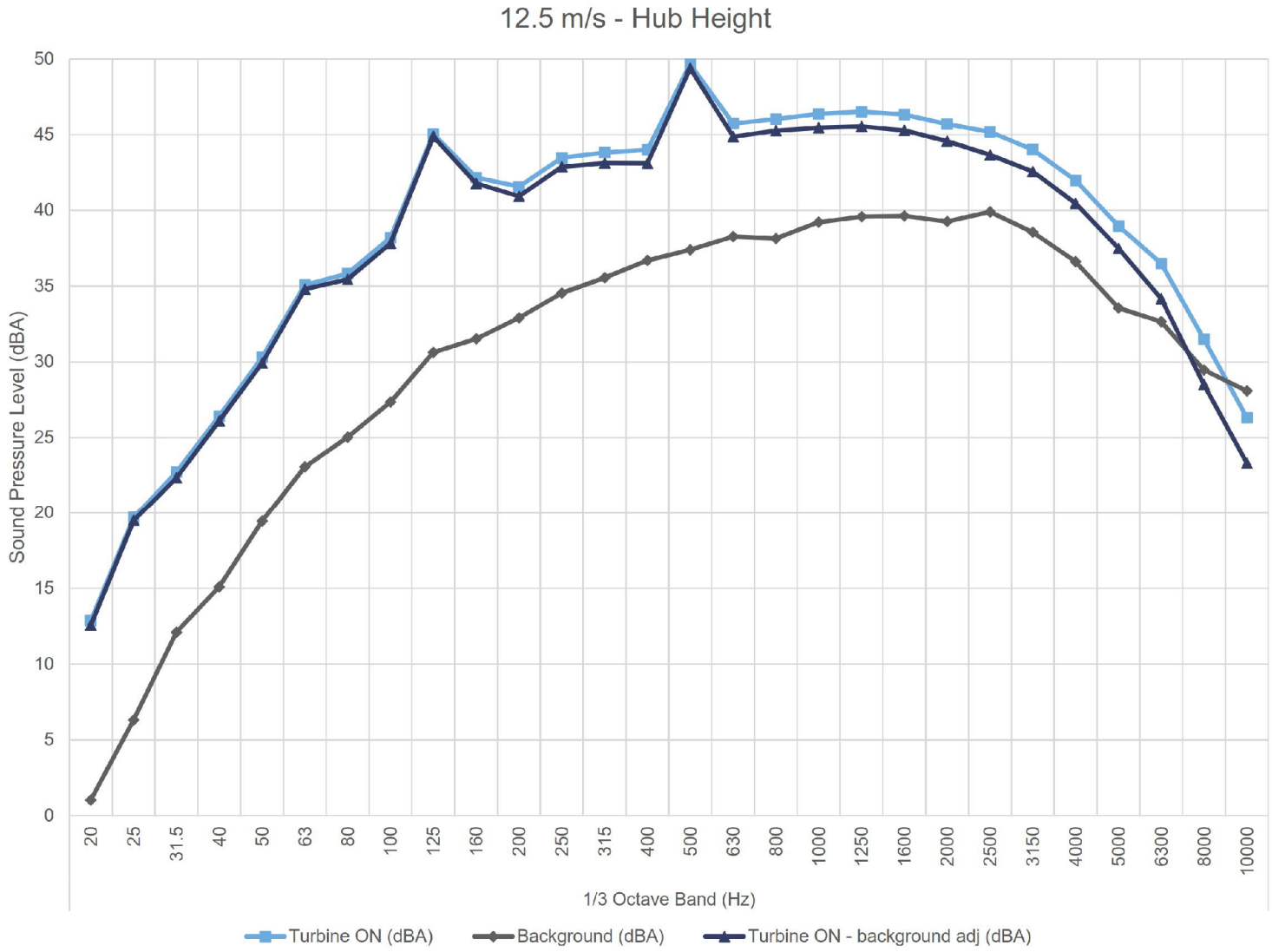
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum in 1/3 Octave at 11.5 m/s

Figure C.12



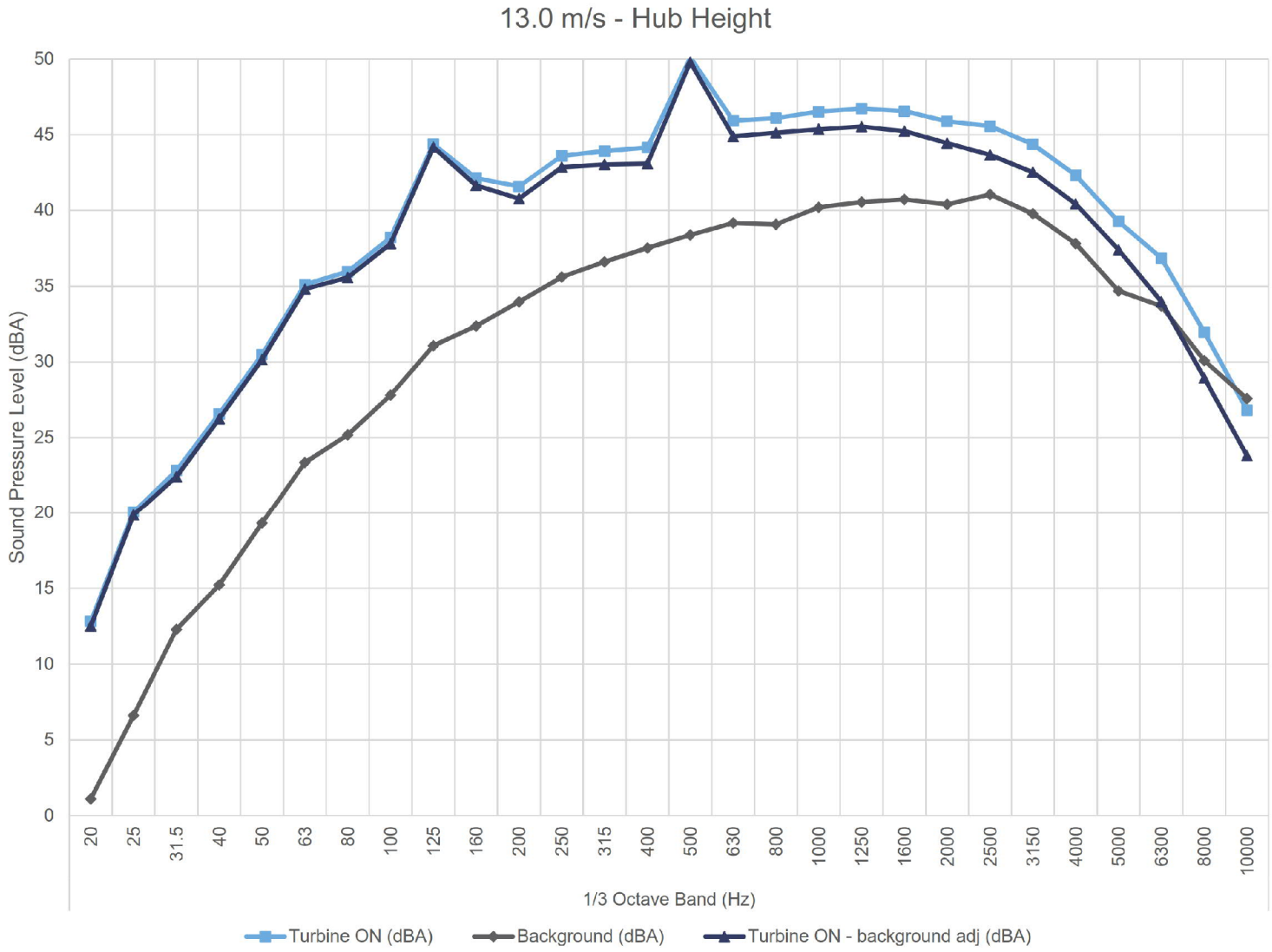
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum in 1/3 Octave at 12 m/s

Figure C.13



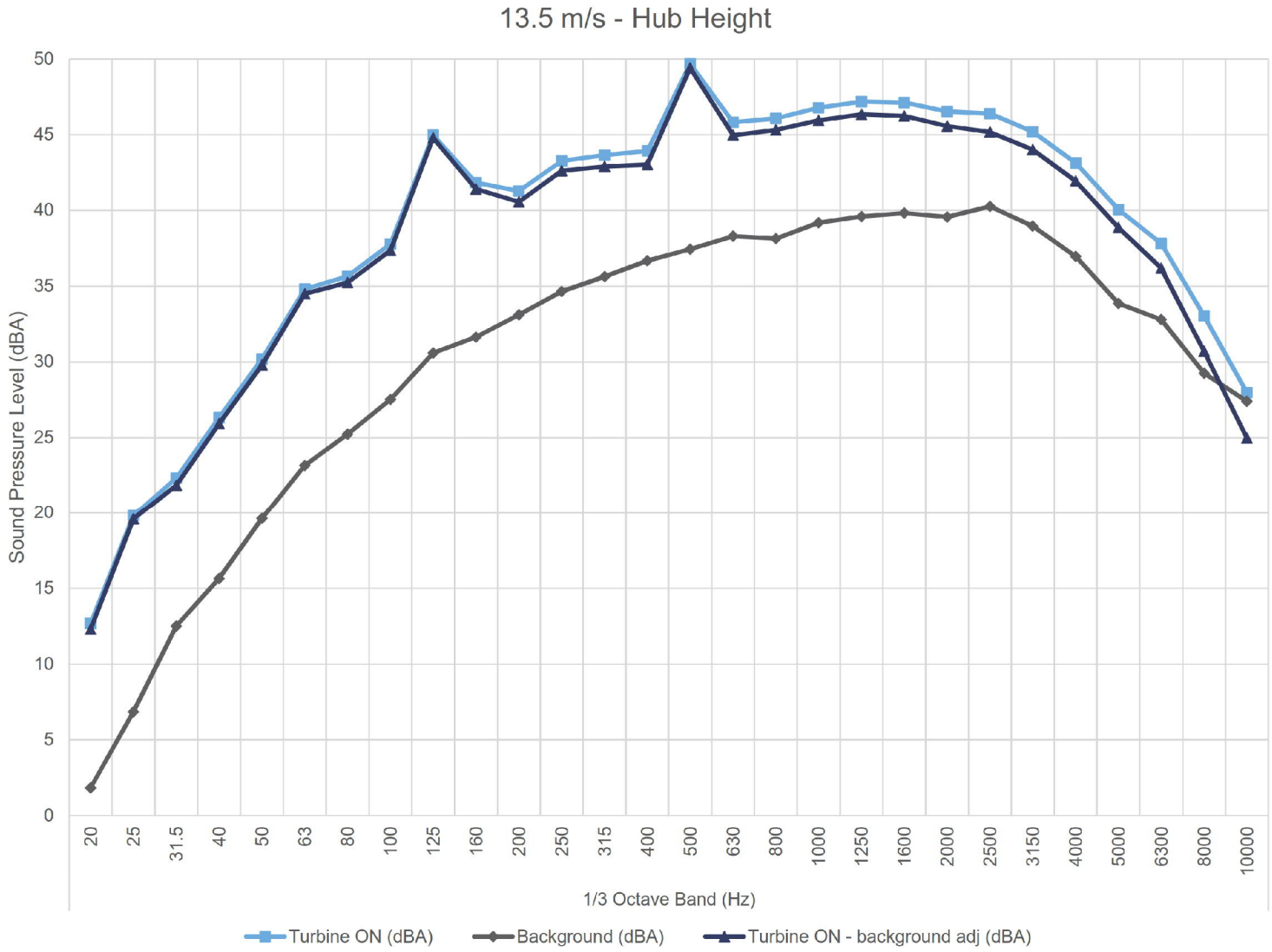
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum in 1/3 Octave at 12.5 m/s

Figure C.14



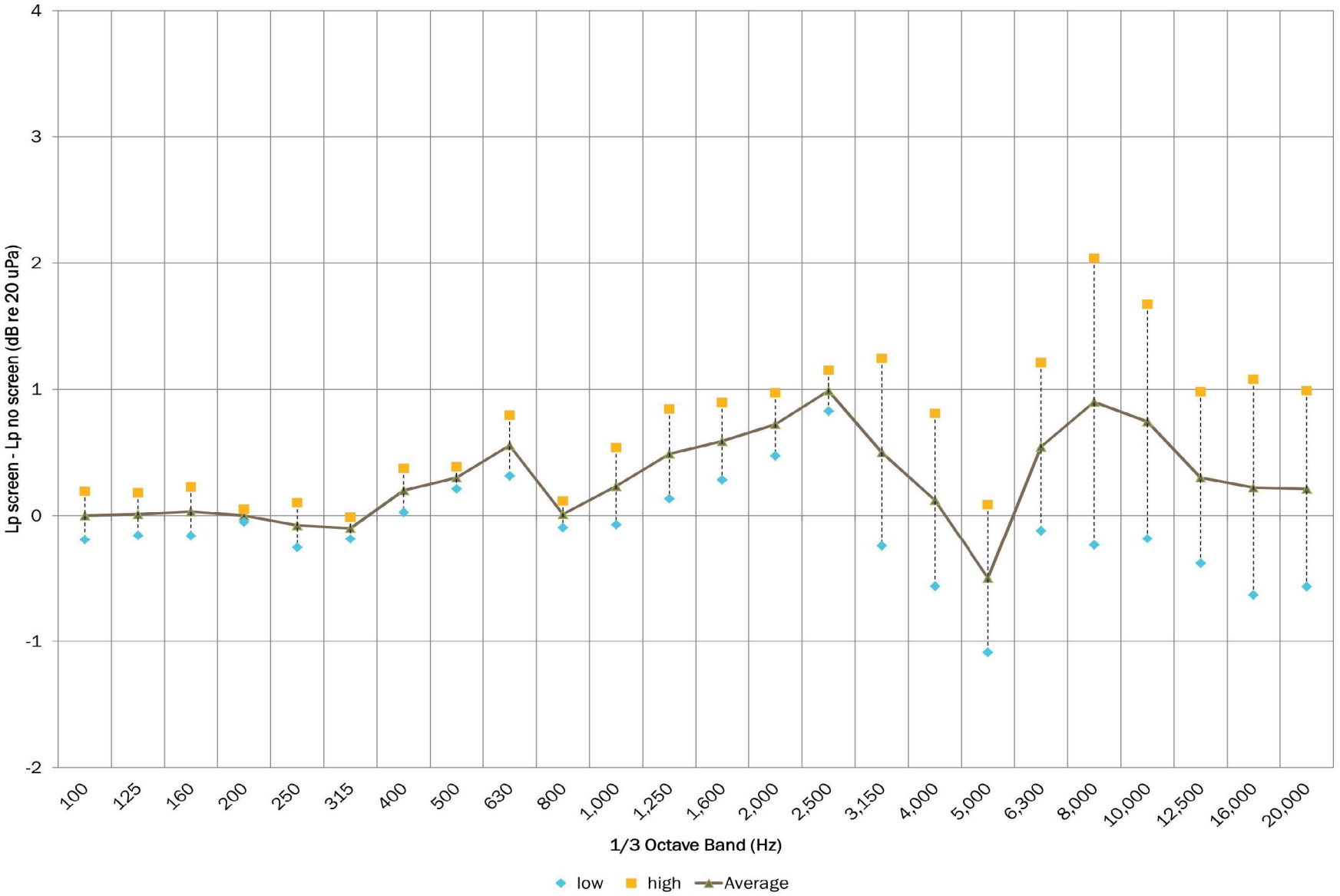
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum in 1/3 Octave at 13 m/s

Figure C.15



aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum in 1/3 Octave at 13.5 m/s

Figure C.16



aercoustics	13259.00.T24.RP3	**Project Name**
	Scale: NTS Drawn by: AM Reviewed by: PA Date: Nov 1, 2017 Revision: 1	Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0
		Figure Title Plot of secondary windscreen influence
		Figure C.17

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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)	10.3	17.1	18.9	23.2	27.2	32.8	32.3	34.4	37.8	39.8	39.9	41.1	41.6	41.7	44.8	43.5	44.4	43.4	43.8	43.6	43.2	41.7	39.7	37.9	35.0	32.7	30.8	34.6	54.5
	Background (dBA)	-1.9	3.1	8.1	11.5	14.8	20.0	22.3	24.1	27.1	28.8	30.2	31.6	31.9	32.7	33.7	33.8	34.0	33.9	34.3	34.3	34.2	34.8	33.9	33.3	31.7	31.6	30.8	35.4	46.1
	Turbine ON - background adj (dBA)	10.1	16.9	18.5	22.9	26.9	32.5	31.8	34.0	37.5	39.4	39.4	40.5	41.1	41.1	44.4	43.0	44.0	42.8	43.2	43.0	42.6	40.8	38.4	36.0	32.2	[29.7]	[27.8]	[31.6]	53.9
	Signal to noise (dB)	12.2	14.0	10.7	11.7	12.4	12.8	10.0	10.3	10.8	11.0	9.7	9.4	9.7	9.0	11.1	9.7	10.4	9.5	9.5	9.2	8.9	7.0	5.8	4.6	3.3	1.0	0.1	-0.8	8.4
	Uncertainty (dB)	1.1	1.1	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.1	1.3	1.7	1.8	1.8	3.6	0.8
	PWL (dBA)	58.6	65.5	67.0	71.4	75.5	81.1	80.4	82.5	86.0	87.9	87.9	89.1	89.7	89.7	93.0	91.6	92.5	91.4	91.8	91.6	91.1	89.3	86.9	84.6	80.8	[78.2]	[76.4]	[80.1]	102.4
8.5	Turbine ON (dBA)	9.8	17.1	18.5	22.9	27.3	33.0	32.2	34.5	38.4	40.0	40.3	41.3	42.0	42.3	46.1	44.1	44.9	43.9	44.4	44.1	43.9	42.4	40.3	38.5	35.6	33.2	31.3	35.1	55.1
	Background (dBA)	-1.0	3.8	9.3	12.4	16.4	21.2	23.6	25.4	28.6	30.1	31.7	33.0	33.2	34.0	34.5	35.1	35.0	35.5	35.9	35.9	35.7	36.4	35.4	34.4	32.4	32.1	30.9	35.1	47.3
	Turbine ON - background adj (dBA)	9.4	16.9	18.0	22.5	26.9	32.7	31.6	34.0	37.9	39.5	39.7	40.7	41.3	41.6	45.8	43.5	44.4	43.2	43.7	43.4	43.2	41.2	38.6	36.3	32.7	[30.2]	[28.3]	[32.1]	54.4
	Signal to noise (dB)	10.7	13.3	9.3	10.5	10.9	11.8	8.6	9.1	9.8	9.8	8.6	8.4	8.8	8.2	11.6	9.0	9.9	8.4	8.5	8.2	8.2	6.1	4.9	4.0	3.1	1.1	0.5	0.0	7.9
	Uncertainty (dB)	1.1	1.1	1.0	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.1	1.3	1.5	1.8	1.8	1.8	3.4	0.9
	PWL (dBA)	57.9	65.4	66.5	71.0	75.5	81.2	80.1	82.5	86.4	88.0	88.2	89.2	89.9	90.1	94.3	92.0	93.0	91.7	92.2	91.9	91.8	89.8	87.2	84.8	81.2	[78.8]	[76.9]	[80.7]	102.9
9.0	Turbine ON (dBA)	10.6	17.6	19.8	23.9	27.9	33.5	33.3	35.6	40.2	40.5	40.6	41.8	42.5	42.6	46.7	44.4	45.1	44.3	44.6	44.4	44.0	42.7	40.9	38.9	36.0	33.5	30.9	34.1	55.5
	Background (dBA)	0.5	5.2	10.1	13.2	17.1	21.4	23.6	25.9	29.2	30.3	31.9	33.2	33.9	34.9	35.8	36.4	36.5	36.9	37.5	37.5	37.3	37.7	36.5	35.2	33.0	32.4	30.5	33.6	48.2
	Turbine ON - background adj (dBA)	10.2	17.3	19.3	23.5	27.5	33.2	32.8	35.1	39.8	40.1	40.0	41.2	41.9	41.8	46.3	43.7	44.4	43.4	43.7	43.4	43.0	41.1	38.9	36.5	[33]	[30.5]	[27.9]	[31.1]	54.7
	Signal to noise (dB)	10.1	12.4	9.7	10.7	10.8	12.1	9.7	9.7	11.0	10.2	8.7	8.7	8.6	7.7	10.9	8.0	8.6	7.3	7.2	6.9	6.8	5.1	4.4	3.7	3.0	1.1	0.5	0.5	7.3
	Uncertainty (dB)	1.2	1.1	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.2	1.4	1.6	1.8	1.8	1.8	3.8	0.9
	PWL (dBA)	58.7	65.9	67.9	72.1	76.1	81.7	81.3	83.6	88.3	88.6	88.6	89.8	90.4	90.3	94.9	92.2	92.9	91.9	92.2	92.0	91.6	89.6	87.4	85.0	[81.5]	[79]	[76.4]	[79.6]	103.2
9.5	Turbine ON (dBA)	11.8	18.5	21.4	25.4	29.3	35.0	34.8	37.1	42.9	41.4	41.2	42.6	43.2	43.3	47.5	44.9	45.3	45.1	45.3	45.0	44.4	43.4	41.8	39.8	36.8	34.2	30.6	32.2	56.3
	Background (dBA)	0.3	5.1	10.3	13.4	17.3	21.7	23.8	26.0	29.3	30.5	32.1	33.6	34.2	35.2	36.1	36.7	36.8	37.5	37.9	38.0	37.8	38.4	37.3	35.8	33.3	32.7	30.6	33.6	48.7
	Turbine ON - background adj (dBA)	11.5	18.3	21.1	25.2	29.0	34.8	34.5	36.7	42.7	41.0	40.6	42.0	42.7	42.6	47.2	44.1	44.6	44.2	44.4	44.0	43.3	41.7	39.9	37.5	34.2	[31.2]	[27.6]	[29.2]	55.5
	Signal to noise (dB)	11.5	13.4	11.1	12.0	12.0	13.3	11.1	11.1	13.6	10.9	9.1	9.0	9.1	8.1	11.4	8.2	8.5	7.6	7.4	7.0	6.6	5.0	4.5	4.0	3.4	1.5	0.0	-1.4	7.6
	Uncertainty (dB)	1.3	1.1	1.2	1.2	1.1	0.9	1.1	1.0	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.3	1.4	1.5	1.6	1.8	1.8	4.0	0.9
	PWL (dBA)	60.0	66.9	69.6	73.7	77.6	83.3	83.0	85.3	91.2	89.6	89.2	90.5	91.2	91.1	95.7	92.7	93.2	92.8	93.0	92.5	91.9	90.3	88.5	86.1	82.7	[79.8]	[76.2]	[77.7]	104.0
10.0	Turbine ON (dBA)	12.9	19.3	22.7	26.6	30.5	35.4	36.1	38.4	44.9	42.2	41.8	43.3	44.0	44.0	48.5	45.4	45.5	45.5	45.5	45.3	44.5	44.0	42.8	40.8	37.7	35.1	30.4	27.6	56.9
	Background (dBA)	0.7	5.5	10.8	14.0	17.9	21.9	24.3	26.3	29.4	30.7	32.3	33.8	34.6	35.7	36.4	37.2	37.3	38.0	38.4	38.6	38.3	38.9	37.7	36.0	33.4	32.7	30.5	33.2	49.1
	Turbine ON - background adj (dBA)	12.7	19.1	22.4	26.4	30.3	35.2	35.9	38.1	44.8	41.8	41.3	42.7	43.4	43.3	48.3	44.7	44.8	44.7	44.6	44.2	43.4	42.4	41.3	39.0	35.7	[32.1]	[27.4]	[24.6]	56.2
	Signal to noise (dB)	12.3	13.8	11.9	12.7	12.6	13.5	11.9	12.1	15.5	11.5	9.5	9.4	9.4	8.3	12.1	8.2	8.2	7.5	7.1	6.7	6.2	5.1	5.2	4.7	4.3	2.4	-0.1	-5.6	7.9
	Uncertainty (dB)	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.7	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.2	1.2	1.3	1.3	1.8	1.8	3.5	0.8
	PWL (dBA)	61.2	67.6	70.9	74.9	78.8	83.7	84.4	86.7	93.3	90.4	89.8	91.3	92.0	91.9	96.8	93.2	93.4	93.2	93.1	92.8	91.9	90.9	89.8	87.5	84.2	[80.6]	[76]	[73.1]	104.7
10.5	Turbine ON (dBA)	13.9	20.1	23.5	27.3	31.2	35.8	36.7	39.0	44.6	42.6	42.1	43.7	44.2	44.3	49.0	45.7	45.8	45.8	45.8	45.6	44.9	44.3	43.2	41.1	38.1	35.4	30.6	25.8	57.2
	Background (dBA)	0.1	5.6	11.3	14.8	19.0	22.7	25.0	28.0	30.6	32.0	33.7	35.3	36.1	37.1	38.0	38.7	38.6	39.7	40.0	40.1	39.7	40.4	39.2	37.4	34.5	33.6	30.7	31.6	50.5
	Turbine ON - background adj (dBA)	13.7	20.0	23.3	27.1	30.9	35.6	36.4	38.6	44.4	42.2	41.4	43.0	43.5	43.4	48.6	44.7	44.9	44.6	44.5	44.1	43.3	42.1	41.0	38.8	35.6	[32.4]	[27.6]	[22.8]	56.2
	Signal to noise (dB)	13.8	14.5	12.3	12.5	12.2	13.1	11.7	11.0	13.9	10.6	8.4	8.3	8.2	7.2	11.0	7.0	7.2	6.1	5.9	5.5	5.2	3.9	4.0	3.8	3.6	1.8	-0.1	-5.8	6.8
	Uncertainty (dB)	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.5	1.5	1.5	1.5	1.8	1.8	3.2	0.9
	PWL (dBA)	62.3	68.5	71.8	75.6	79.5	84.1	84.9	87.2	92.9	90.8	90.0	91.5	92.1	91.9	97.1	93.3	93.5	93.1	93.1	92.7	91.8	90.6	89.5	87.3	84.1	[81]	[76.1]	[71.4]	104.8

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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	
11.0	Turbine ON (dBA)	12.9	19.8	22.9	26.8	30.6	35.3	36.1	38.4	44.4	42.2	41.7	43.4	43.9	44.0	49.5	45.7	45.9	46.2	46.3	46.1	45.4	44.9	43.7	41.7	38.7	36.2	31.3	26.3	57.4
	Background (dBA)	1.3	6.2	12.0	15.5	19.0	22.8	24.6	27.0	30.2	31.4	32.9	34.4	35.1	36.2	37.0	37.8	38.0	38.6	38.9	39.0	38.8	39.1	37.9	36.3	33.8	32.9	30.3	32.2	49.5
	Turbine ON - background adj (dBA)	12.6	19.6	22.6	26.5	30.3	35.0	35.8	38.0	44.3	41.8	41.1	42.9	43.2	43.2	49.2	44.9	45.1	45.4	45.5	45.1	44.3	43.5	42.4	40.2	37.0	33.4	[28.3]	[23.3]	56.7
	Signal to noise (dB)	11.6	13.6	11.0	11.3	11.6	12.5	11.5	11.4	14.2	10.7	8.7	9.1	8.8	7.8	12.5	7.9	7.9	7.6	7.4	7.1	6.6	5.7	5.8	5.4	4.9	3.3	1.0	-5.9	7.9
	Uncertainty (dB)	1.1	1.1	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.2	1.2	1.2	1.3	1.7	1.9	3.5	0.9
	PWL (dBA)	61.2	68.2	71.1	75.0	78.8	83.5	84.3	86.6	92.8	90.3	89.6	91.4	91.8	91.8	97.8	93.4	93.7	93.9	94.0	93.7	92.9	92.1	91.0	88.7	85.5	82.0	[76.8]	[71.8]	105.2
11.5	Turbine ON (dBA)	12.7	19.9	22.7	26.8	30.4	35.1	36.2	38.1	44.4	42.2	41.6	43.4	43.8	43.9	49.8	45.7	45.9	46.3	46.3	46.1	45.4	44.8	43.6	41.6	38.5	36.0	31.0	25.8	57.5
	Background (dBA)	1.6	6.3	11.8	14.9	18.7	22.8	24.8	27.3	30.8	31.6	33.0	34.7	35.4	36.4	37.2	38.0	38.5	39.4	39.5	39.2	38.9	39.4	38.1	36.5	33.8	32.8	30.1	31.5	49.8
	Turbine ON - background adj (dBA)	12.4	19.7	22.4	26.5	30.1	34.9	35.8	37.8	44.2	41.8	41.0	42.8	43.1	43.1	49.5	44.8	45.0	45.2	45.3	45.1	44.3	43.4	42.2	40.0	36.8	33.1	[28]	[22.8]	56.7
	Signal to noise (dB)	11.2	13.6	11.0	11.8	11.7	12.3	11.4	10.8	13.6	10.6	8.6	8.8	8.4	7.5	12.5	7.6	7.4	6.8	6.8	6.8	6.5	5.4	5.5	5.1	4.8	3.2	0.9	-5.7	7.6
	Uncertainty (dB)	1.1	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.9	0.9	0.9	0.9	1.2	1.2	1.2	1.3	1.7	1.8	3.3	0.9
	PWL (dBA)	60.9	68.3	70.9	75.0	78.7	83.4	84.4	86.3	92.7	90.3	89.5	91.4	91.7	91.6	98.1	93.4	93.6	93.8	93.9	93.6	92.8	91.9	90.7	88.5	85.3	81.7	[76.5]	[71.4]	105.2
12.0	Turbine ON (dBA)	13.0	19.7	22.8	26.5	30.4	35.0	35.8	38.1	45.0	42.1	41.6	43.4	43.7	43.8	49.6	45.6	45.9	46.2	46.4	46.1	45.5	44.9	43.7	41.7	38.7	36.2	31.3	26.3	57.5
	Background (dBA)	2.5	7.7	13.7	17.2	20.6	24.5	26.4	28.8	30.9	31.8	33.5	35.1	35.8	36.9	37.7	38.5	38.7	39.6	40.1	40.3	40.2	40.8	39.5	37.7	35.1	34.3	31.2	30.6	50.6
	Turbine ON - background adj (dBA)	12.6	19.5	22.2	26.0	29.9	34.6	35.2	37.6	44.8	41.7	40.8	42.7	43.0	42.9	49.3	44.7	45.0	45.1	45.2	44.8	44.0	42.8	41.7	39.5	36.3	[33.2]	[28.3]	[23.3]	56.5
	Signal to noise (dB)	10.5	12.0	9.1	9.3	9.8	10.5	9.3	9.3	14.1	10.3	8.1	8.2	7.9	6.9	11.8	7.1	7.2	6.6	6.3	5.9	5.3	4.2	4.2	4.0	3.7	1.9	0.1	-4.3	6.9
	Uncertainty (dB)	1.1	1.0	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.4	1.4	1.5	1.6	1.9	1.9	3.3	0.9
	PWL (dBA)	61.1	68.0	70.8	74.5	78.5	83.1	83.8	86.1	93.3	90.2	89.4	91.2	91.5	91.4	97.8	93.2	93.5	93.7	93.7	93.4	92.5	91.4	90.2	88.1	84.8	[81.8]	[76.8]	[71.8]	105.0
12.5	Turbine ON (dBA)	12.9	19.7	22.7	26.4	30.3	35.1	35.8	38.2	45.1	42.2	41.6	43.5	43.8	44.0	49.7	45.7	46.0	46.4	46.5	46.3	45.7	45.2	44.0	42.0	39.0	36.5	31.5	26.3	57.6
	Background (dBA)	1.0	6.3	12.1	15.1	19.4	23.1	25.0	27.4	30.6	31.5	32.9	34.6	35.6	36.7	37.4	38.3	38.2	39.2	39.6	39.6	39.3	39.9	38.6	36.6	33.6	32.7	29.5	28.1	49.9
	Turbine ON - background adj (dBA)	12.6	19.5	22.3	26.1	29.9	34.8	35.5	37.8	44.9	41.8	40.9	42.9	43.1	43.1	49.4	44.9	45.3	45.5	45.5	45.3	44.6	43.7	42.6	40.5	37.5	34.2	[28.5]	[23.3]	56.8
	Signal to noise (dB)	11.8	13.4	10.6	11.3	10.9	12.0	10.8	10.8	14.4	10.6	8.7	8.9	8.3	7.3	12.3	7.5	7.9	7.2	6.9	6.7	6.4	5.3	5.5	5.4	5.4	3.8	2.0	-1.8	7.7
	Uncertainty (dB)	1.1	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.9	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.2	1.6	1.9	3.4	0.9
	PWL (dBA)	61.1	68.0	70.9	74.6	78.5	83.3	84.0	86.4	93.4	90.3	89.5	91.4	91.7	91.7	97.9	93.4	93.8	94.0	94.1	93.8	93.1	92.2	91.1	89.0	86.0	82.7	[77.1]	[71.9]	105.4
13.0	Turbine ON (dBA)	12.8	20.1	22.8	26.6	30.5	35.1	36.0	38.2	44.4	42.1	41.6	43.6	43.9	44.2	50.1	45.9	46.1	46.5	46.7	46.6	45.9	45.6	44.4	42.3	39.3	36.9	32.0	26.8	57.8
	Background (dBA)	1.1	6.6	12.3	15.2	19.3	23.4	25.2	27.8	31.1	32.4	34.0	35.6	36.6	37.5	38.4	39.2	39.1	40.2	40.6	40.7	40.4	41.1	39.8	37.8	34.7	33.7	30.1	27.6	50.9
	Turbine ON - background adj (dBA)	12.5	19.9	22.4	26.3	30.1	34.8	35.6	37.8	44.2	41.7	40.8	42.9	43.0	43.1	49.8	44.9	45.1	45.4	45.5	45.2	44.4	43.7	42.5	40.4	37.4	34.0	[29]	[23.8]	56.8
	Signal to noise (dB)	11.7	13.5	10.5	11.4	11.2	11.8	10.8	10.4	13.3	9.8	7.6	8.0	7.3	6.6	11.7	6.7	7.0	6.3	6.2	5.8	5.5	4.5	4.6	4.5	4.6	3.2	1.9	-0.8	6.9
	Uncertainty (dB)	1.1	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.4	1.4	1.4	1.4	1.9	2.0	3.4	1.0
	PWL (dBA)	61.1	68.4	71.0	74.8	78.7	83.4	84.1	86.4	92.7	90.2	89.3	91.4	91.6	91.6	98.3	93.4	93.7	93.9	94.1	93.8	93.0	92.2	91.1	89.0	86.0	82.5	[77.5]	[72.4]	105.3
13.5	Turbine ON (dBA)	12.7	19.8	22.3	26.3	30.2	34.8	35.6	37.8	45.0	41.8	41.3	43.3	43.7	43.9	49.7	45.8	46.1	46.8	47.2	47.1	46.5	46.4	45.2	43.1	40.1	37.8	33.1	28.0	58.0
	Background (dBA)	1.8	6.8	12.5	15.6	19.6	23.2	25.2	27.5	30.6	31.6	33.1	34.7	35.6	36.7	37.5	38.3	38.1	39.2	39.6	39.8	39.6	40.3	39.0	37.0	33.9	32.8	29.3	27.4	50.1
	Turbine ON - background adj (dBA)	12.3	19.6	21.8	25.9	29.8	34.5	35.2	37.4	44.8	41.4	40.6	42.6	42.9	43.0	49.4	45.0	45.3	45.9	46.3	46.2	45.6	45.2	44.0	41.9	38.9	36.2	30.7	[25]	57.2
	Signal to noise (dB)	10.8	13.0	9.8	10.7	10.6	11.6	10.4	10.3	14.4	10.2	8.2	8.6	8.0	7.3	12.2	7.5	7.9	7.6	7.6	7.3	7.0	6.1	6.2	6.2	6.2	5.0	3.8	0.6	7.9
	Uncertainty (dB)	1.1	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.9	0.8	0.9	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.2	1.4	1.7	3.5	0.9
	PWL (dBA)	60.8	68.1	70.4	74.5	78.3	83.0	83.8	85.9	93.3	90.0	89.1	91.2	91.5	91.6	98.0	93.5	93.9	94.5	94.9	94.8	94.1	93.7	92.6	90.5	87.4	84.7	79.2	[73.5]	105.8

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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)	12.3	11.1	15.4	21.5	23.8	30.7	29.2	32.1	36.1	37.4	37.7	38.1	38.5	39.6	41.4	40.6	41.3	39.9	40.1	40.3	39.6	38.6	37.0	35.4	32.9	31.4	30.3	33.8	51.6
	Background (dBA)	-2.4	2.8	7.8	11.4	15.0	19.7	21.0	22.9	25.6	26.3	27.5	29.4	29.6	30.7	31.3	30.9	30.8	30.3	30.3	30.5	30.5	31.0	30.7	30.8	29.9	30.5	30.6	35.8	43.7
	Turbine ON - background adj (dBA)	12.1	10.4	14.6	21.0	23.1	30.4	28.5	31.5	35.7	37.0	37.3	37.4	37.9	39.0	40.9	40.1	41.0	39.3	39.6	39.8	39.0	37.8	35.8	33.6	30.0	[28.4]	[27.3]	[30.8]	50.9
	Signal to noise (dB)	14.7	8.3	7.6	10.0	8.8	11.0	8.2	9.1	10.5	11.1	10.2	8.7	8.9	8.9	10.1	9.7	10.6	9.6	9.7	9.8	9.1	7.6	6.3	4.6	3.1	1.0	-0.2	-2.1	7.8
	Uncertainty (dB)	1.0	1.2	1.0	0.9	0.9	0.8	0.9	0.9	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.8	0.8	0.7	0.8	0.9	1.0	1.2	1.7	1.7	1.8	3.2	0.8
	PWL (dBA)	60.7	58.9	63.1	69.6	71.7	78.9	77.0	80.0	84.2	85.6	85.9	86.0	86.5	87.5	89.5	88.6	89.5	87.9	88.1	88.3	87.5	86.4	84.3	82.2	78.5	[77]	[75.9]	[79.3]	99.4
6.0	Turbine ON (dBA)	10.3	17.0	18.8	23.1	27.3	32.9	32.3	34.6	38.3	39.9	40.2	41.2	41.8	42.0	45.6	43.8	44.6	43.6	44.0	43.8	43.5	42.1	40.1	38.2	35.3	33.0	31.0	34.7	54.8
	Background (dBA)	-0.9	3.9	9.0	12.3	16.0	20.7	23.0	24.9	28.0	29.5	31.0	32.3	32.7	33.6	34.4	34.8	34.9	35.2	35.6	35.7	35.5	36.0	35.1	34.1	32.2	31.9	30.7	35.0	47.0
	Turbine ON - background adj (dBA)	10.0	16.8	18.3	22.8	26.9	32.6	31.8	34.1	37.9	39.5	39.6	40.6	41.2	41.3	45.3	43.2	44.1	42.9	43.3	43.1	42.8	40.9	38.4	36.1	32.4	[30]	[28]	[31.7]	54.1
	Signal to noise (dB)	11.2	13.0	9.8	10.9	11.3	12.1	9.3	9.6	10.3	10.4	9.1	8.9	9.1	8.4	11.3	9.0	9.7	8.4	8.4	8.1	8.0	6.1	5.0	4.1	3.1	1.1	0.3	-0.3	7.9
	Uncertainty (dB)	1.1	1.0	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.1	1.2	1.4	1.7	1.8	1.8	3.3	0.9
	PWL (dBA)	58.5	65.3	66.8	71.3	75.5	81.1	80.3	82.6	86.4	88.0	88.1	89.2	89.8	89.9	93.8	91.8	92.7	91.5	91.9	91.6	91.3	89.4	87.0	84.6	80.9	[78.5]	[76.6]	[80.3]	102.7
7.0	Turbine ON (dBA)	12.3	18.8	21.9	25.9	29.7	34.9	35.3	37.5	43.5	41.6	41.4	42.8	43.5	43.5	47.9	45.1	45.4	45.2	45.3	45.1	44.5	43.6	42.2	40.2	37.2	34.6	30.6	30.8	56.5
	Background (dBA)	0.3	5.3	10.6	13.8	17.8	22.0	24.3	26.6	29.7	31.0	32.6	34.2	34.8	35.8	36.7	37.4	37.4	38.2	38.6	38.7	38.4	39.1	37.9	36.3	33.7	32.9	30.6	33.0	49.3
	Turbine ON - background adj (dBA)	12.0	18.6	21.5	25.6	29.4	34.7	34.9	37.2	43.4	41.2	40.7	42.2	42.8	42.7	47.6	44.2	44.6	44.2	44.3	43.9	43.2	41.7	40.2	37.9	34.6	[31.6]	[27.6]	[27.8]	55.6
	Signal to noise (dB)	12.0	13.5	11.3	12.0	11.8	12.9	11.0	11.0	13.9	10.6	8.7	8.6	8.6	7.7	11.3	7.7	8.0	7.0	6.7	6.4	6.0	4.5	4.3	3.9	3.5	1.7	0.0	-2.2	7.2
	Uncertainty (dB)	1.1	1.0	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.2	1.3	1.4	1.5	1.7	1.7	3.3	0.9
	PWL (dBA)	60.5	67.1	70.1	74.1	77.9	83.2	83.4	85.7	91.9	89.8	89.3	90.7	91.4	91.3	96.2	92.8	93.2	92.8	92.8	92.5	91.7	90.3	88.7	86.4	83.1	[80.1]	[76.1]	[76.4]	104.1
8.0	Turbine ON (dBA)	13.0	19.8	22.8	26.7	30.5	35.2	36.1	38.3	44.4	42.2	41.7	43.4	43.9	44.0	49.5	45.7	45.9	46.1	46.3	46.0	45.3	44.8	43.6	41.6	38.5	36.0	31.1	26.3	57.4
	Background (dBA)	1.2	6.1	11.7	15.1	18.8	22.7	24.6	27.3	30.4	31.6	33.1	34.7	35.4	36.4	37.3	38.0	38.3	39.0	39.3	39.2	38.9	39.4	38.2	36.5	33.9	33.0	30.4	32.0	49.8
	Turbine ON - background adj (dBA)	12.7	19.6	22.5	26.4	30.2	35.0	35.8	37.9	44.2	41.8	41.1	42.8	43.2	43.2	49.2	44.9	45.1	45.2	45.3	45.0	44.2	43.3	42.2	40.0	36.7	33.0	[28.1]	[23.3]	56.6
	Signal to noise (dB)	11.8	13.7	11.2	11.7	11.7	12.6	11.5	11.0	14.0	10.6	8.6	8.8	8.5	7.6	12.2	7.7	7.6	7.1	7.0	6.8	6.4	5.4	5.4	5.1	4.7	3.0	0.8	-5.7	7.7
	Uncertainty (dB)	1.1	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.9	0.9	0.9	0.9	1.2	1.1	1.2	1.3	1.8	1.8	3.2	0.9
	PWL (dBA)	61.2	68.2	71.0	75.0	78.8	83.5	84.3	86.5	92.8	90.4	89.6	91.4	91.8	91.7	97.8	93.4	93.6	93.7	93.8	93.5	92.7	91.9	90.7	88.5	85.3	81.6	[76.7]	[71.9]	105.1
9.0	Turbine ON (dBA)	12.9	19.8	22.8	26.5	30.4	35.1	35.9	38.1	44.9	42.1	41.5	43.5	43.8	43.9	49.7	45.7	46.0	46.3	46.5	46.3	45.7	45.2	44.0	42.0	39.0	36.5	31.6	26.4	57.6
	Background (dBA)	1.7	7.1	13.0	16.2	20.0	23.9	25.8	28.2	30.9	31.9	33.4	35.1	36.0	37.1	37.9	38.7	38.7	39.7	40.1	40.3	40.1	40.7	39.4	37.5	34.6	33.7	30.4	28.9	50.5
	Turbine ON - background adj (dBA)	12.6	19.6	22.3	26.1	30.0	34.7	35.4	37.7	44.7	41.7	40.8	42.8	43.0	42.9	49.4	44.7	45.1	45.3	45.4	45.1	44.3	43.3	42.2	40.1	37.0	[33.5]	[28.6]	[23.4]	56.6
	Signal to noise (dB)	11.2	12.7	9.8	10.3	10.4	11.2	10.1	10.0	14.0	10.2	8.1	8.4	7.8	6.8	11.8	7.0	7.3	6.6	6.4	6.0	5.6	4.5	4.6	4.5	4.4	2.8	1.1	-2.4	7.0
	Uncertainty (dB)	1.1	1.0	0.9	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.3	1.3	1.3	1.3	1.8	1.8	3.1	0.9
	PWL (dBA)	61.1	68.1	70.9	74.7	78.5	83.3	84.0	86.2	93.3	90.2	89.3	91.3	91.5	91.5	97.9	93.3	93.6	93.8	93.9	93.6	92.8	91.8	90.7	88.6	85.5	[82]	[77.1]	[72]	105.2
10.0	Turbine ON (dBA)	12.7	19.7	22.3	26.2	30.2	34.8	35.4	37.6	44.7	41.7	41.0	43.2	43.4	43.7	49.4	45.6	46.0	46.6	47.1	47.0	46.3	46.1	44.9	42.9	39.8	37.5	32.7	27.6	57.8
	Background (dBA)	1.4	6.7	12.5	15.5	19.7	23.1	25.3	27.7	30.8	31.8	33.3	34.8	35.9	37.0	37.6	38.5	38.3	39.4	39.8	40.0	39.6	40.4	39.1	37.1	33.9	32.9	29.3	26.7	50.2
	Turbine ON - background adj (dBA)	12.3	19.5	21.9	25.9	29.7	34.4	35.0	37.2	44.5	41.2	40.2	42.5	42.6	42.6	49.1	44.7	45.1	45.7	46.1	46.0	45.3	44.7	43.6	41.5	38.5	35.7	30.0	[24.6]	56.9
	Signal to noise (dB)	11.3	13.0	9.9	10.8	10.5	11.6	10.2	10.0	13.9	9.9	7.7	8.4	7.5	6.6	11.7	7.1	7.7	7.2	7.3	7.0	6.7	5.7	5.8	5.7	5.9	4.6	3.4	0.9	7.6
	Uncertainty (dB)	1.1	1.0	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.9	0.7	0.8	0.8	0.9	0.9	0.9	0.9	1.2	1.1	1.1	1.1	1.3	1.6	3.2	0.9
	PWL (dBA)	60.9	68.0	70.4	74.4	78.3	83.0	83.6	85.7	93.1	89.8	88.8	91.0	91.1	91.1	97.6	93.3	93.7	94.2	94.7	94.6	93.9	93.3	92.1	90.1	87.1	84.2	78.6	[73.1]	105.5

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	1 dB
25	0.8 dB	1 dB
31.5	0.5 dB	0.8 dB
40	0.5 dB	0.8 dB
50	0.5 dB	0.8 dB
63	0.5 dB	0.8 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	0.7 dB
1250	0.3 dB	0.7 dB
1600	0.3 dB	0.7 dB
2000	0.3 dB	0.7 dB
2500	0.5 dB	0.8 dB
3150	0.5 dB	0.8 dB
4000	0.5 dB	0.8 dB
5000	0.5 dB	0.8 dB
6300	0.5 dB	0.8 dB
8000	0.5 dB	0.8 dB
10000	1.3 dB	1.4 dB

Table C.04 Detailed measruement uncertainty at hub height

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 11/6/2017

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	8.01	25	Average (dBA)	10.3	17.2	18.9	23.2	27.2	32.8	32.3	34.4	37.9	39.8	39.9	41.1	41.7	41.7	44.8	43.5	44.4	43.4	43.8	43.6	43.2	41.8	39.8	37.9	35.0	32.7	30.9	34.6	54.6
				Uncertainty A (dB)	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.8		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.7		
	Background	7.99	22	Average (dBA)	-1.9	3.1	8.1	11.5	14.8	20.0	22.3	24.1	27.0	28.8	30.2	31.6	31.9	32.7	33.6	33.7	34.0	33.8	34.3	34.3	34.2	34.7	33.9	33.3	31.7	31.6	30.8	35.4	46.1
				Uncertainty A (dB)	0.5	0.4	0.3	0.4	0.4	0.4	0.6	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.8	0.8	0.7	0.6	0.4	0.3	0.2	0.7			
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4			
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.9	0.9	0.9	1.0	0.9	0.9	1.0	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.1	1.0	0.9	0.9	0.8	1.6			
8.5	Turbine ON	8.49	31	Average (dBA)	9.7	17.1	18.5	22.9	27.3	33.0	32.2	34.5	38.3	40.0	40.3	41.3	41.9	42.3	46.1	44.1	44.9	43.9	44.4	44.1	43.9	42.4	40.3	38.4	35.6	33.2	31.3	35.2	55.1
				Uncertainty A (dB)	0.3	0.2	0.3	0.3	0.3	0.2	0.3	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	0.2	0.1	0.1	0.1	0.1	0.3			
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4			
				Combined Uncertainty (dB)	1.0	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.5			
	Background	8.50	20	Average (dBA)	-1.0	3.8	9.3	12.4	16.4	21.2	23.6	25.4	28.6	30.1	31.7	33.0	33.2	34.0	34.5	35.1	35.0	35.5	35.9	35.9	35.7	36.4	35.4	34.4	32.4	32.1	30.9	35.1	47.3
				Uncertainty A (dB)	0.5	0.4	0.4	0.4	0.6	0.4	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	1.0	1.0	1.0	1.0	1.1	1.0	0.8	0.6	0.5	0.3	0.9			
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4			
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.9	1.0	0.9	1.1	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.4	1.3	1.1	1.0	0.9	0.9	1.7			
9.0	Turbine ON	9.01	43	Average (dBA)	10.6	17.6	19.9	24.0	27.9	33.5	33.3	35.6	40.2	40.5	40.6	41.9	42.5	42.6	46.7	44.4	45.1	44.3	44.6	44.4	44.0	42.7	40.9	38.9	36.0	33.5	30.9	34.1	55.5
				Uncertainty A (dB)	0.4	0.2	0.5	0.4	0.3	0.2	0.3	0.3	0.3	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	0.1	0.1	0.1	0.1	0.2	0.8			
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4			
				Combined Uncertainty (dB)	1.1	1.0	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.6			
	Background	8.97	17	Average (dBA)	0.5	5.2	10.1	13.2	17.1	21.4	23.6	25.9	29.2	30.3	31.9	33.2	33.9	34.9	35.7	36.4	36.5	36.9	37.4	37.5	37.2	37.6	36.5	35.2	33.0	32.3	30.4	33.6	48.2
				Uncertainty A (dB)	0.7	0.6	0.6	0.5	0.6	0.5	0.6	0.6	0.7	0.5	0.5	0.6	0.7	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.8	0.6	0.5	0.4	0.5	1.6			
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4			
				Combined Uncertainty (dB)	1.2	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	1.0	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.1	1.0	1.0	0.9	0.9	2.1			
9.5	Turbine ON	9.51	28	Average (dBA)	11.8	18.5	21.4	25.5	29.3	35.0	34.9	37.1	42.9	41.4	41.2	42.6	43.2	43.3	47.5	44.9	45.3	45.1	45.3	45.0	44.4	43.4	41.8	39.8	36.8	34.2	30.6	32.1	56.3
				Uncertainty A (dB)	0.7	0.4	0.8	0.7	0.6	0.4	0.6	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	1.1			
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4			
				Combined Uncertainty (dB)	1.2	1.1	1.1	1.1	1.0	0.9	1.0	1.0	1.0	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.8			
	Background	9.46	35	Average (dBA)	0.3	5.1	10.2	13.4	17.3	21.7	23.7	25.9	29.3	30.5	32.1	33.6	34.1	35.1	36.0	36.7	36.8	37.4	37.8	38.0	37.8	38.4	37.3	35.8	33.3	32.7	30.6	33.6	48.6
				Uncertainty A (dB)	0.6	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.9	0.8	0.6	0.5	0.4	0.4	1.1			
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4			
				Combined Uncertainty (dB)	1.2	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.2	1.1	1.0	0.9	0.9	0.9	1.8			
10.0	Turbine ON	10.06	20	Average (dBA)	13.1	19.4	22.8	26.8	30.7	35.4	36.3	38.6	45.2	42.3	41.9	43.3	44.1	44.1	48.7	45.5	45.5	45.6	45.6	45.3	44.5	44.0	43.0	40.9	37.8	35.2	30.4	27.0	57.0
				Uncertainty A (dB)	0.4	0.3	0.5	0.5	0.4	0.2	0.2	0.3	0.6	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.7			
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4			
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.9	0.9	0.8	0.8	0.9	1.0	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	1.6			
	Background	10.00	24	Average (dBA)	0.7	5.5	10.8	14.0	17.9	21.9	24.3	26.3	29.4	30.7	32.3	33.8	34.6	35.7	36.4	37.2	37.3	38.0	38.4	38.6	38.3	38.9	37.6	36.0	33.4	32.7	30.5	33.2	49.1
				Uncertainty A (dB)	0.6	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.7	0.9	0.9	0.9	1.0	1.0	1.0	0.8	0.6	0.5	0.5	1.4			
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4			
				Combined Uncertainty (dB)	1.2	1.1	1.0	0.9	1.0	0.9	1.0	1.0	1.0	1.0	0.9	0.9	1.0	1.0	1.0	1.1	1.0	1.2	1.1	1.2	1.2	1.3	1.3	1.1	1.0	1.0	0.9	2.0			

Table C.04 Detailed measruement uncertainty at hub height

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 11/6/2017

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	10.58	13	Average (dBA)	14.1	20.2	23.6	27.4	31.3	35.9	36.8	39.1	44.5	42.7	42.2	43.7	44.3	44.3	49.0	45.7	45.9	45.8	45.9	45.6	44.9	44.4	43.2	41.2	38.1	35.5	30.6	25.6	57.3
				Uncertainty A (dB)	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.6	0.2	0.2	0.2	0.2	0.2	0.4	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.4	0.5	0.5		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.9	0.8	0.8	0.8	0.9	1.0	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.9	0.9	0.9	0.9	0.9	0.9	1.5		
	Background	10.49	31	Average (dBA)	0.1	5.6	11.3	14.8	19.0	22.7	25.0	28.0	30.6	32.0	33.7	35.4	36.1	37.1	38.0	38.7	38.6	39.7	40.0	40.1	39.7	40.4	39.2	37.4	34.5	33.6	30.7	31.6	50.5
				Uncertainty A (dB)	0.5	0.5	0.5	0.5	0.6	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.8	0.8	0.8	0.8	0.9	0.8	0.7	0.5	0.5	0.4	1.0		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	1.0	0.9	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.0	0.9	0.9	1.8		
11.0	Turbine ON	10.99	30	Average (dBA)	12.9	19.8	22.9	26.8	30.6	35.3	36.1	38.4	44.4	42.2	41.7	43.4	43.9	44.0	49.5	45.7	45.9	46.2	46.3	46.1	45.4	44.9	43.7	41.7	38.7	36.2	31.3	26.3	57.4
				Uncertainty A (dB)	0.2	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	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.5		
	Background	11.00	24	Average (dBA)	1.3	6.3	12.0	15.5	19.0	22.8	24.6	27.0	30.2	31.4	32.9	34.4	35.1	36.2	37.0	37.8	38.0	38.6	38.9	39.0	38.7	39.1	37.9	36.3	33.7	32.8	30.3	32.2	49.5
				Uncertainty A (dB)	0.6	0.5	0.6	0.6	0.6	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.7	0.6	0.5	0.5	0.5	1.3		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.2	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.0	1.0	0.9	0.9	2.0		
11.5	Turbine ON	11.53	25	Average (dBA)	12.7	20.0	22.7	26.7	30.4	35.1	36.2	38.1	44.4	42.2	41.6	43.4	43.8	43.9	49.8	45.7	45.9	46.3	46.3	46.1	45.4	44.8	43.6	41.6	38.5	36.0	31.0	25.8	57.5
				Uncertainty A (dB)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.5		
	Background	11.47	26	Average (dBA)	1.5	6.3	11.7	14.8	18.6	22.7	24.7	27.3	30.8	31.6	33.0	34.7	35.4	36.4	37.2	38.0	38.5	39.4	39.5	39.2	38.8	39.3	38.1	36.4	33.7	32.8	30.1	31.6	49.8
				Uncertainty A (dB)	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.8	0.7	0.7	0.7	0.8	0.8	0.7	0.5	0.5	0.5	1.3		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.2	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	0.9	0.9	1.9		
12.0	Turbine ON	11.96	37	Average (dBA)	13.0	19.7	22.8	26.5	30.4	35.0	35.8	38.1	45.0	42.1	41.6	43.4	43.7	43.8	49.6	45.6	45.9	46.2	46.3	46.1	45.5	44.9	43.7	41.7	38.7	36.2	31.3	26.3	57.4
				Uncertainty A (dB)	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.5		
	Background	12.04	21	Average (dBA)	2.5	7.8	13.9	17.4	20.8	24.7	26.5	28.9	30.9	31.9	33.5	35.2	35.9	37.0	37.8	38.6	38.7	39.6	40.1	40.3	40.3	40.9	39.6	37.8	35.1	34.5	31.3	30.5	50.7
				Uncertainty A (dB)	0.8	0.6	0.8	0.8	0.8	0.7	0.7	0.6	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.7	0.7	0.8	0.9	0.9	0.9	0.8	0.8	0.8	0.8	1.3		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.2	1.2	1.1	1.1	1.1	2.0		
12.5	Turbine ON	12.50	36	Average (dBA)	12.9	19.7	22.7	26.4	30.3	35.1	35.8	38.2	45.1	42.2	41.6	43.5	43.8	44.0	49.7	45.7	46.0	46.4	46.5	46.3	45.7	45.2	44.0	42.0	39.0	36.5	31.5	26.3	57.6
				Uncertainty A (dB)	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.5		
	Background	12.48	19	Average (dBA)	1.0	6.3	12.1	15.1	19.4	23.1	25.0	27.3	30.6	31.5	32.9	34.5	35.5	36.7	37.4	38.2	38.1	39.2	39.6	39.6	39.2	39.9	38.5	36.6	33.5	32.6	29.4	28.1	49.9
				Uncertainty A (dB)	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.7	0.8	0.8	0.7	0.6	0.6	0.5	1.1		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.8		
13.0	Turbine ON	12.99	19	Average (dBA)	12.8	20.1	22.8	26.6	30.5	35.1	36.0	38.2	44.4	42.1	41.6	43.6	43.9	44.2	50.1	45.9	46.1	46.5	46.7	46.5	45.9	45.6	44.4	42.3	39.3	36.8	31.9	26.8	57.8
				Uncertainty A (dB)	0.3	0.2	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.1	1.0	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.9	0.9	0.9	0.9	0.9	0.9	1.5		
	Background	13.05	15	Average (dBA)	1.1	6.6	12.3	15.2	19.3	23.4	25.2	27.9	31.1	32.5	34.1	35.7	36.7	37.6	38.5	39.3	39.2	40.3	40.7	40.8	40.5	41.2	39.9	37.9	34.8	33.8	30.2	27.5	51.0
				Uncertainty A (dB)	0.6	0.5	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.9		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.2	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.7		
13.5	Turbine ON	13.48	23	Average (dBA)	12.7	19.8	22.3	26.3	30.2	34.8	35.7	37.8	45.0	41.9	41.3	43.3	43.7	43.9	49.7	45.8	46.1	46.8	47.2	47.1	46.6	46.4	45.2	43.2	40.1	37.8	33.1	28.0	58.0
				Uncertainty A (dB)	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	1.5		
	Background	13.48	11	Average (dBA)	1.9	6.8	12.5	15.7	19.6	23.2	25.2	27.5	30.6	31.6	33.1	34.6	35.6	36.6	37.4	38.2	38.1	39.1	39.6	39.8	39.5	40.2	38.9	36.9	33.8	32.8	29.2	27.5	50.0
				Uncertainty A (dB)	1.1	0.6	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.7	0.7	0.8	0.9	1.0	1.1	1.0	0.8	0.7	0.6	1.3		
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.5	1.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.9	0.8	1.0	1.0	1.1	1.2	1.3	1.3	1.2	1.1	1.1	1.0	2.0		

Table C.05 Secondary Windscreen Influence

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 11/1/2017

1/3 Octave Band (Hz)	Average (dB) (Lp screen - Lp no screen)	Standard Deviation (dB)
100	0.0	0.2
125	0.0	0.2
160	0.0	0.2
200	0.0	0.0
250	-0.1	0.2
315	-0.1	0.1
400	0.2	0.2
500	0.3	0.1
630	0.6	0.2
800	0.0	0.1
1000	0.2	0.3
1250	0.5	0.4
1600	0.6	0.3
2000	0.7	0.2
2500	1.0	0.2
3150	0.5	0.7
4000	0.1	0.7
5000	-0.5	0.6
6300	0.5	0.7
8000	0.9	1.1
10000	0.7	0.9
12500	0.3	0.7
16000	0.2	0.9
20000	0.2	0.8

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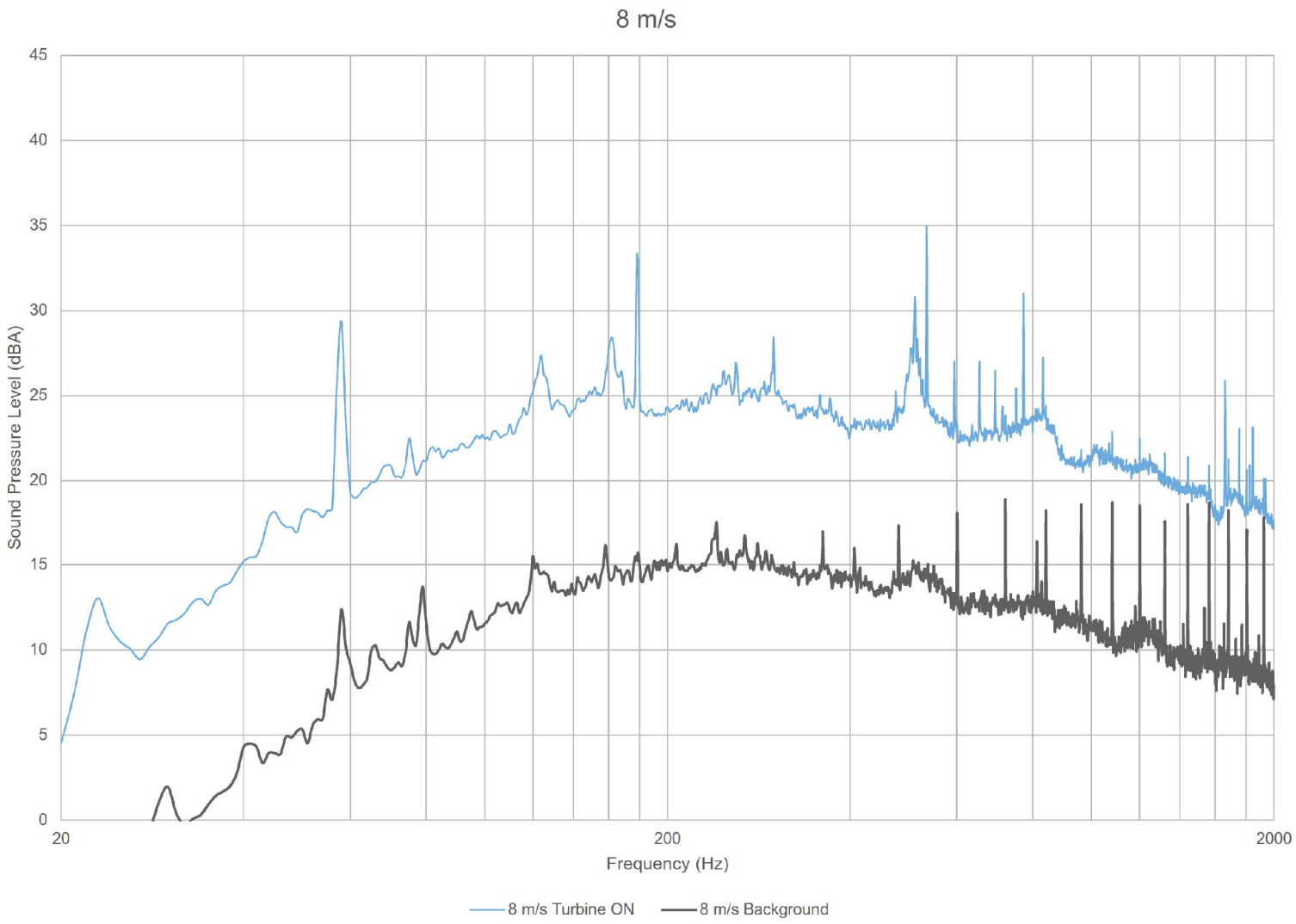
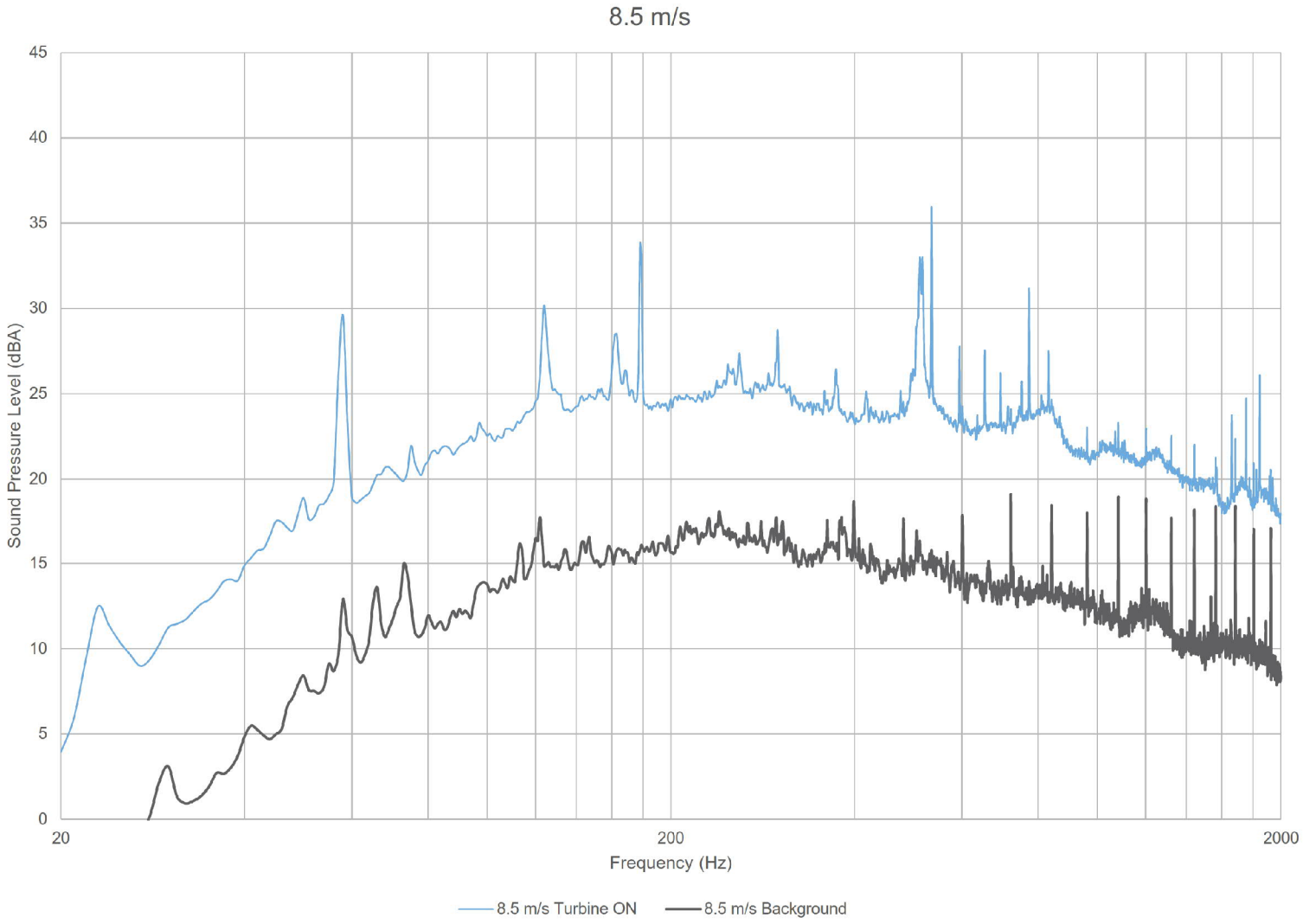
Appendix D
Tonality Assessment



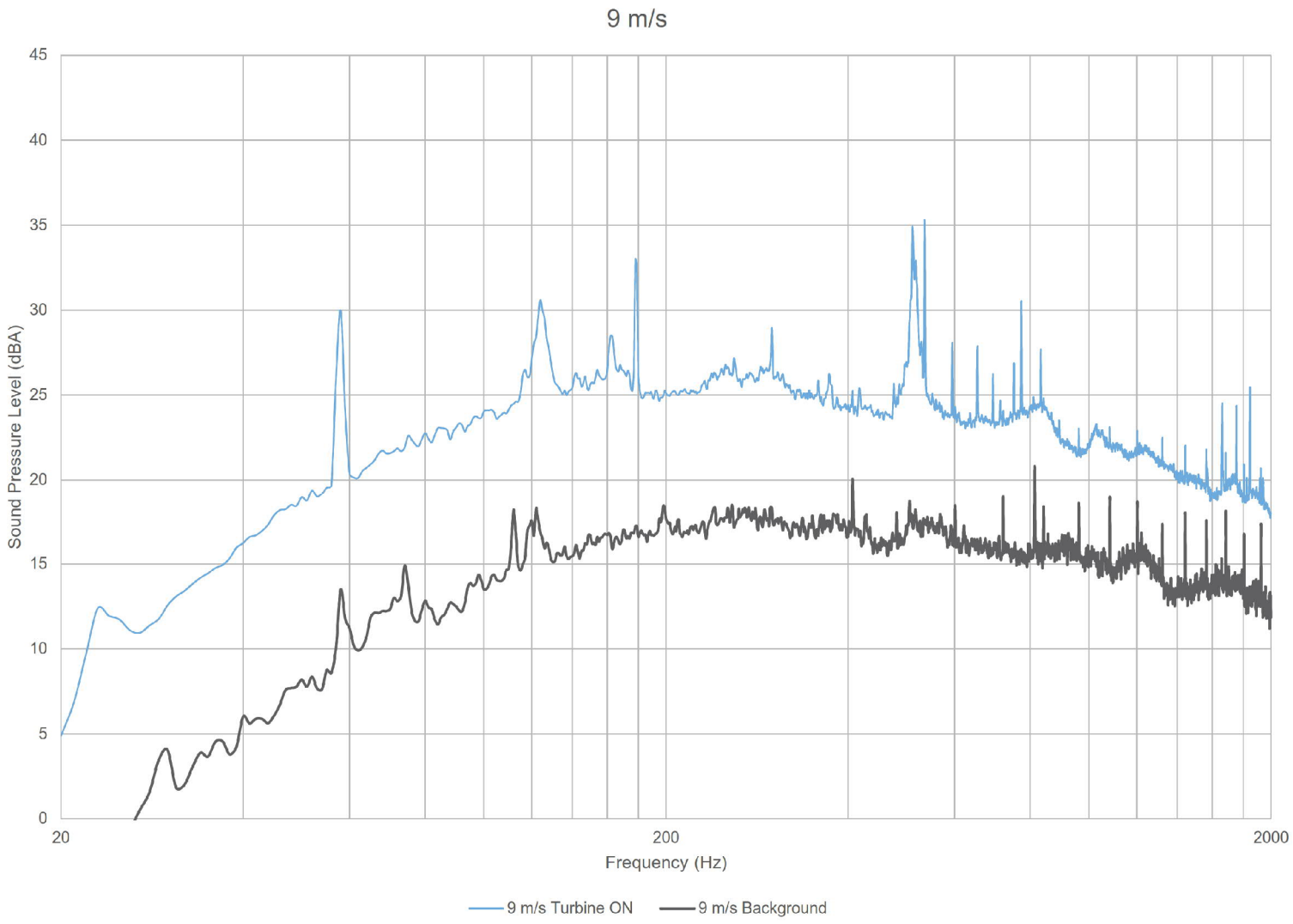
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 8 m/s

Figure D.01



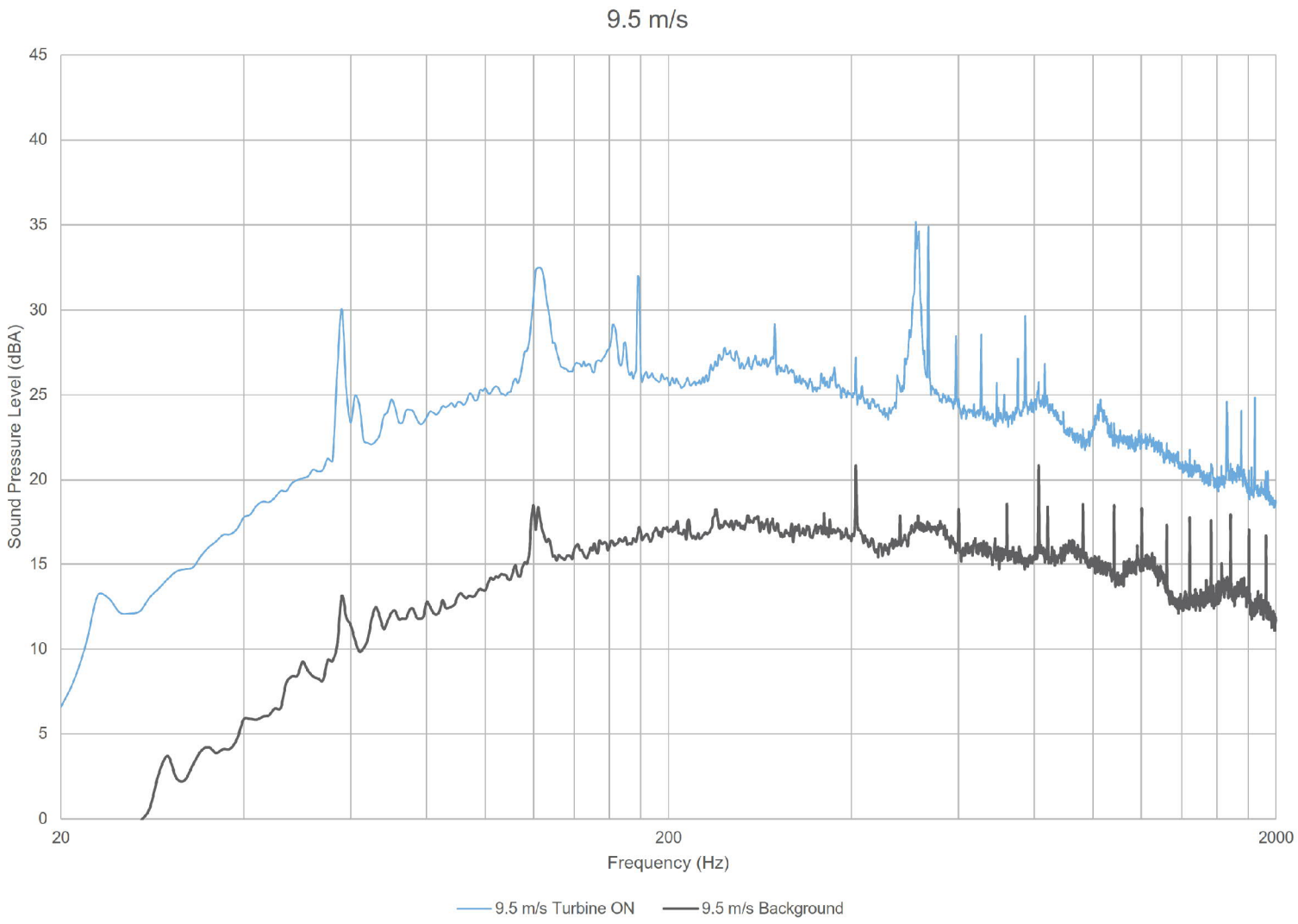
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 8.5 m/s

Figure D.02



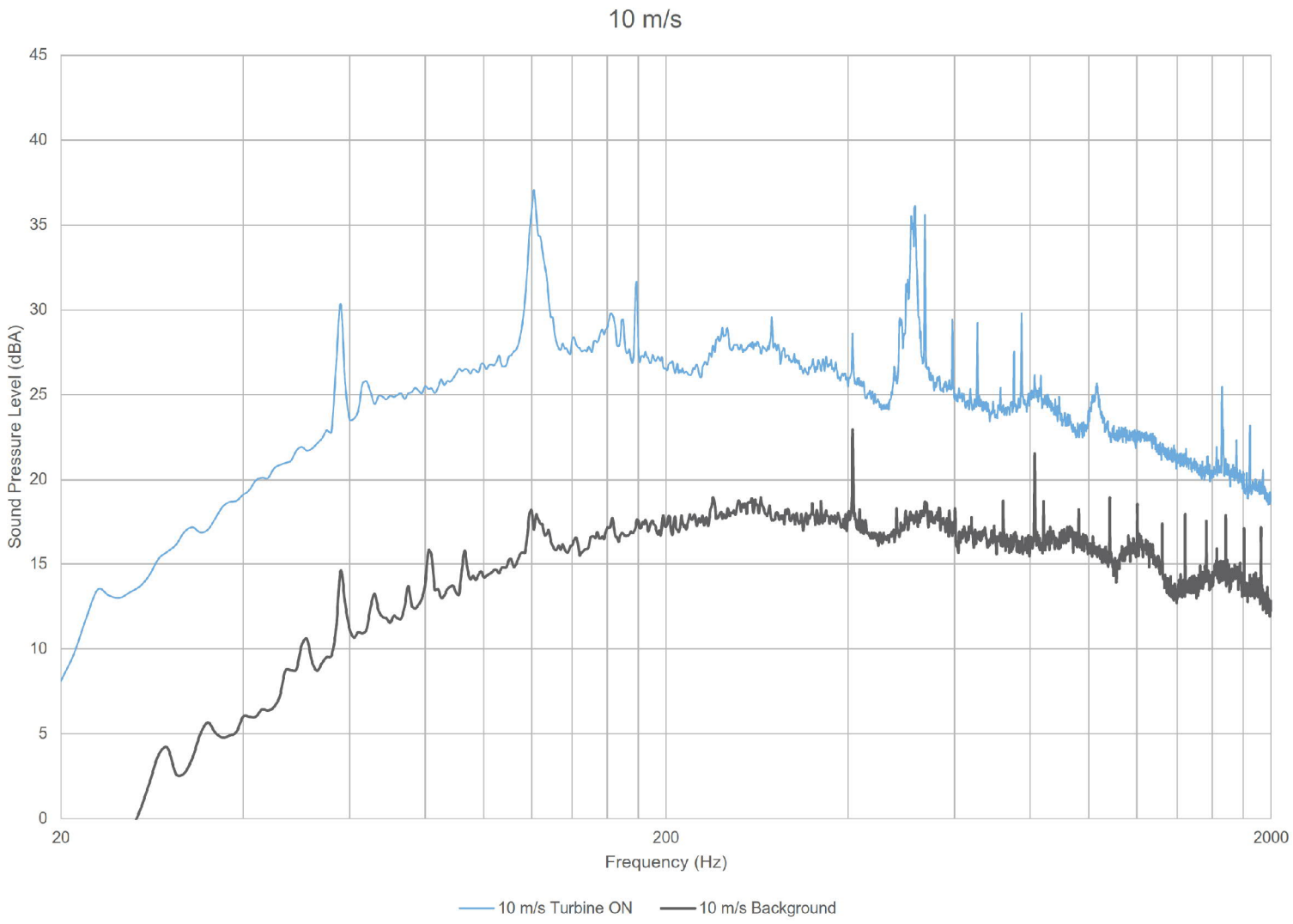
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 9 m/s

Figure D.03



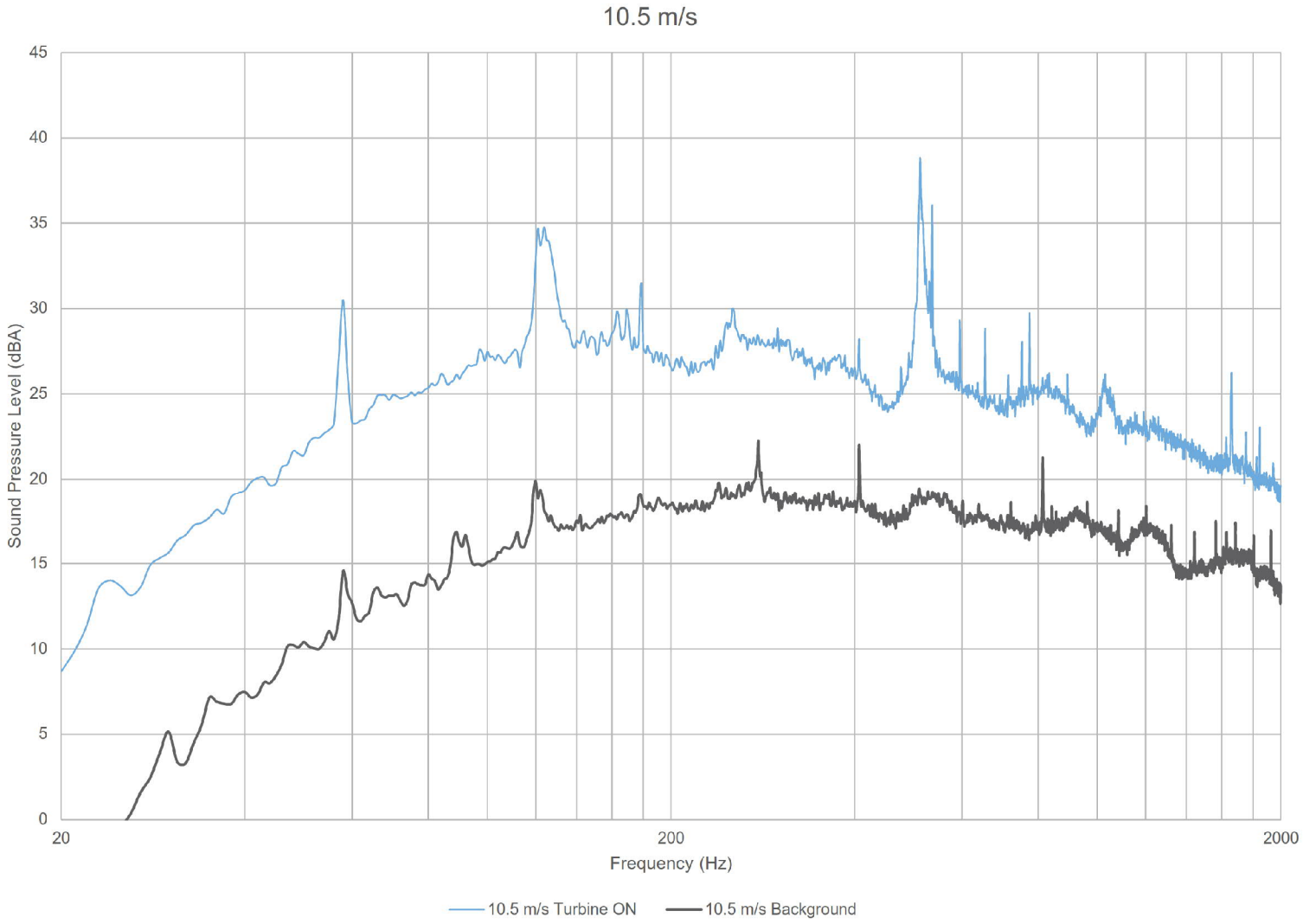
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 9.5 m/s

Figure D.04



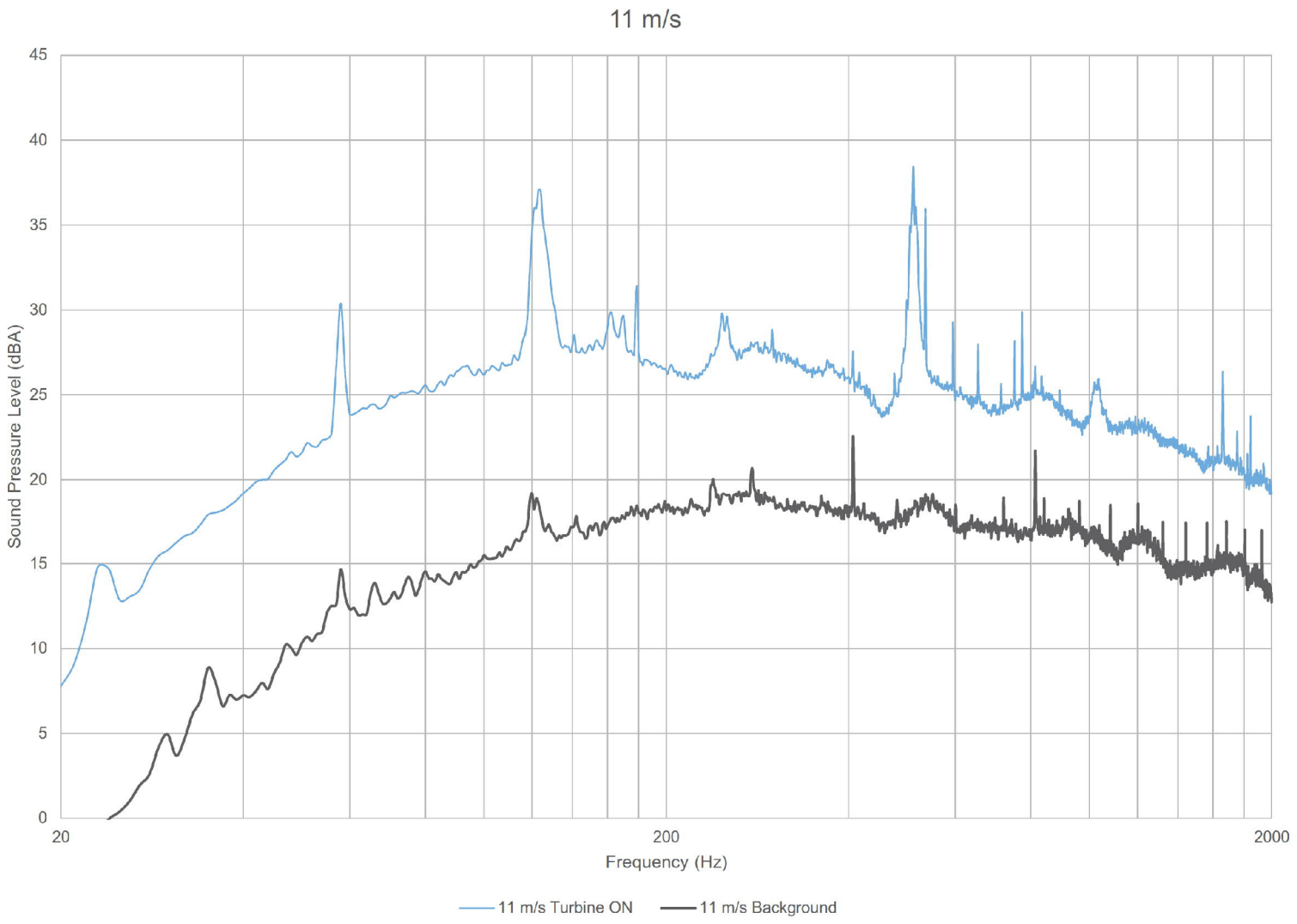
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 10 m/s

Figure D.05



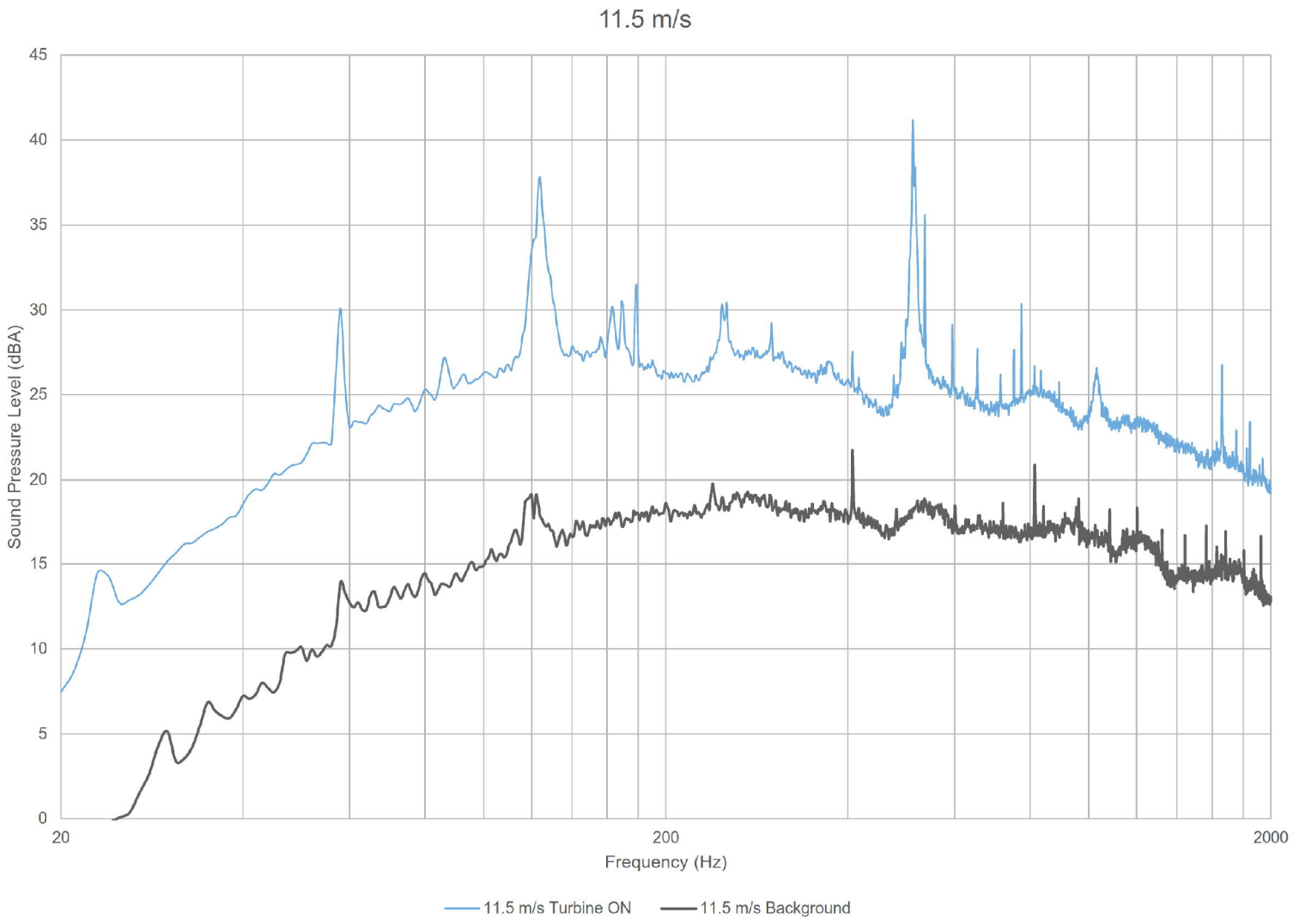
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 10.5 m/s

Figure D.06



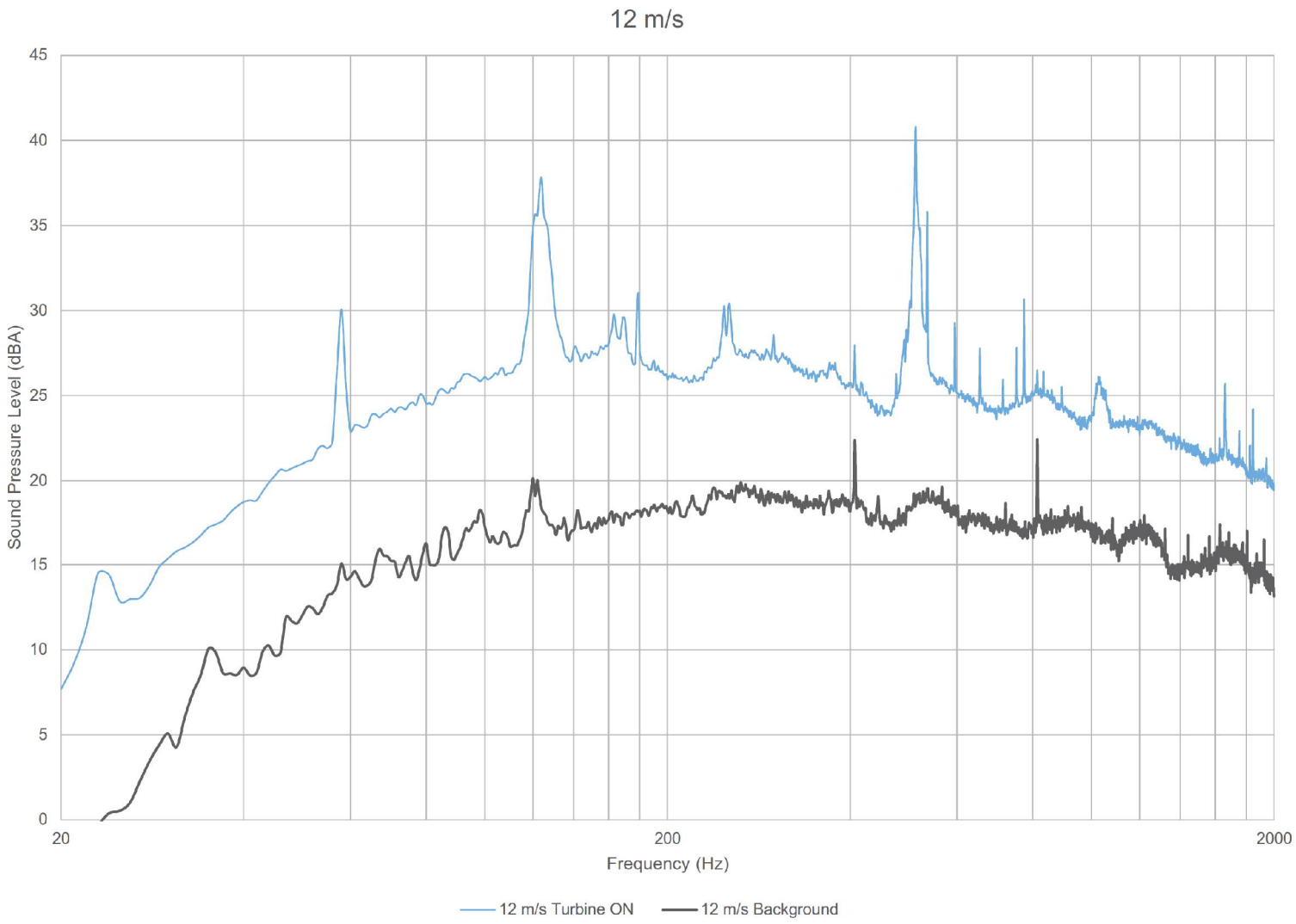
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 11 m/s

Figure D.07



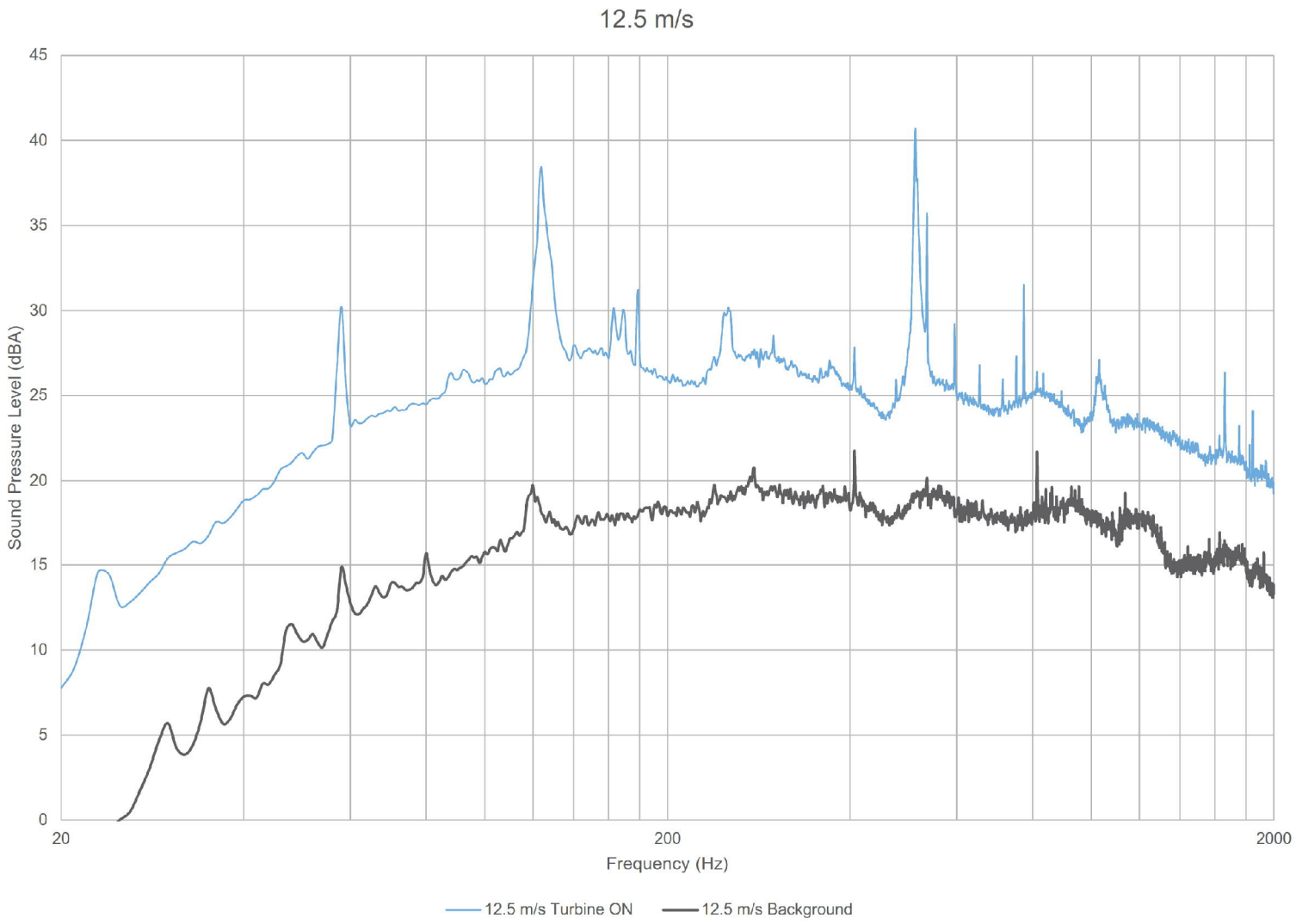
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 11.5 m/s

Figure D.08



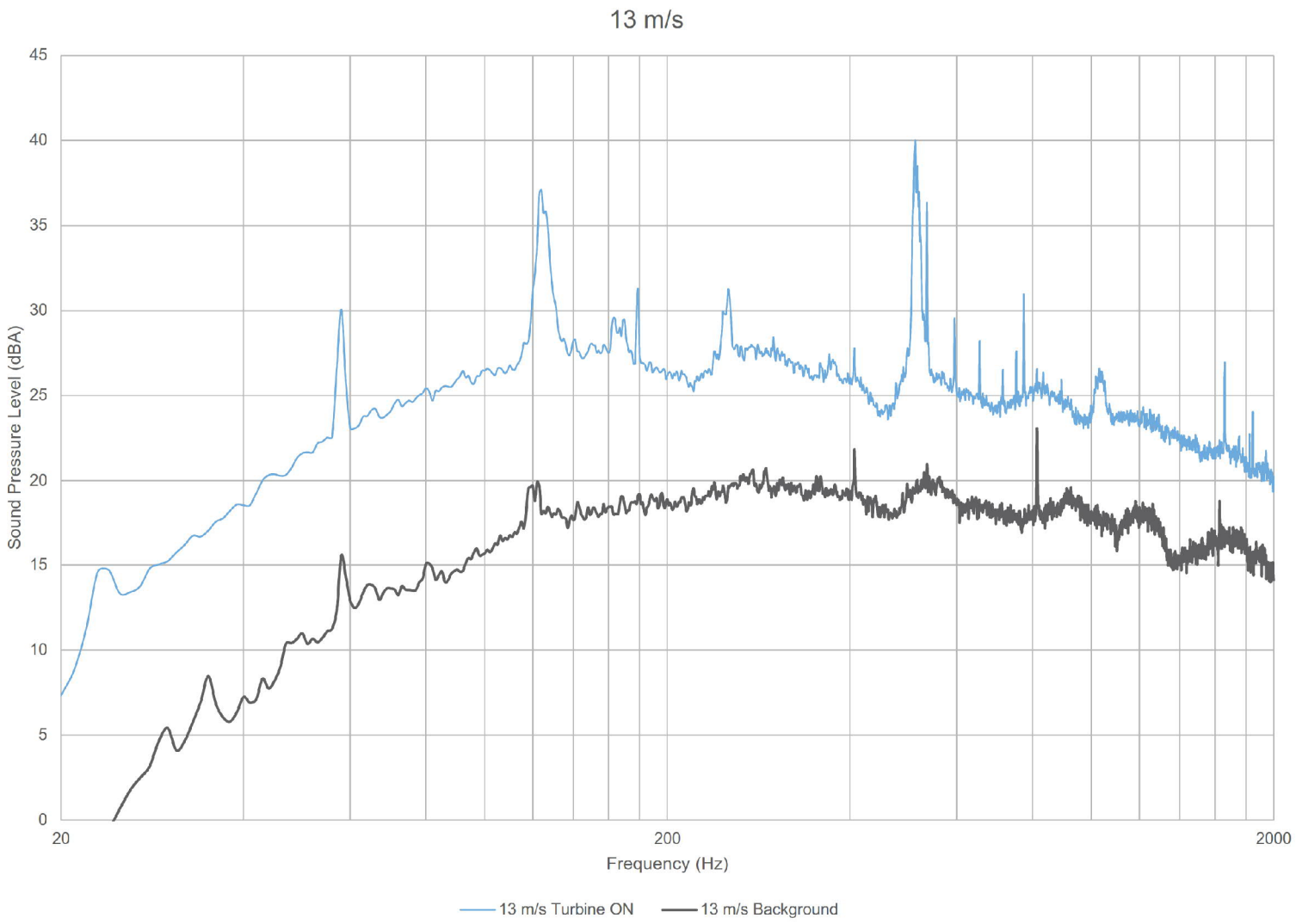
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 12 m/s

Figure D.09



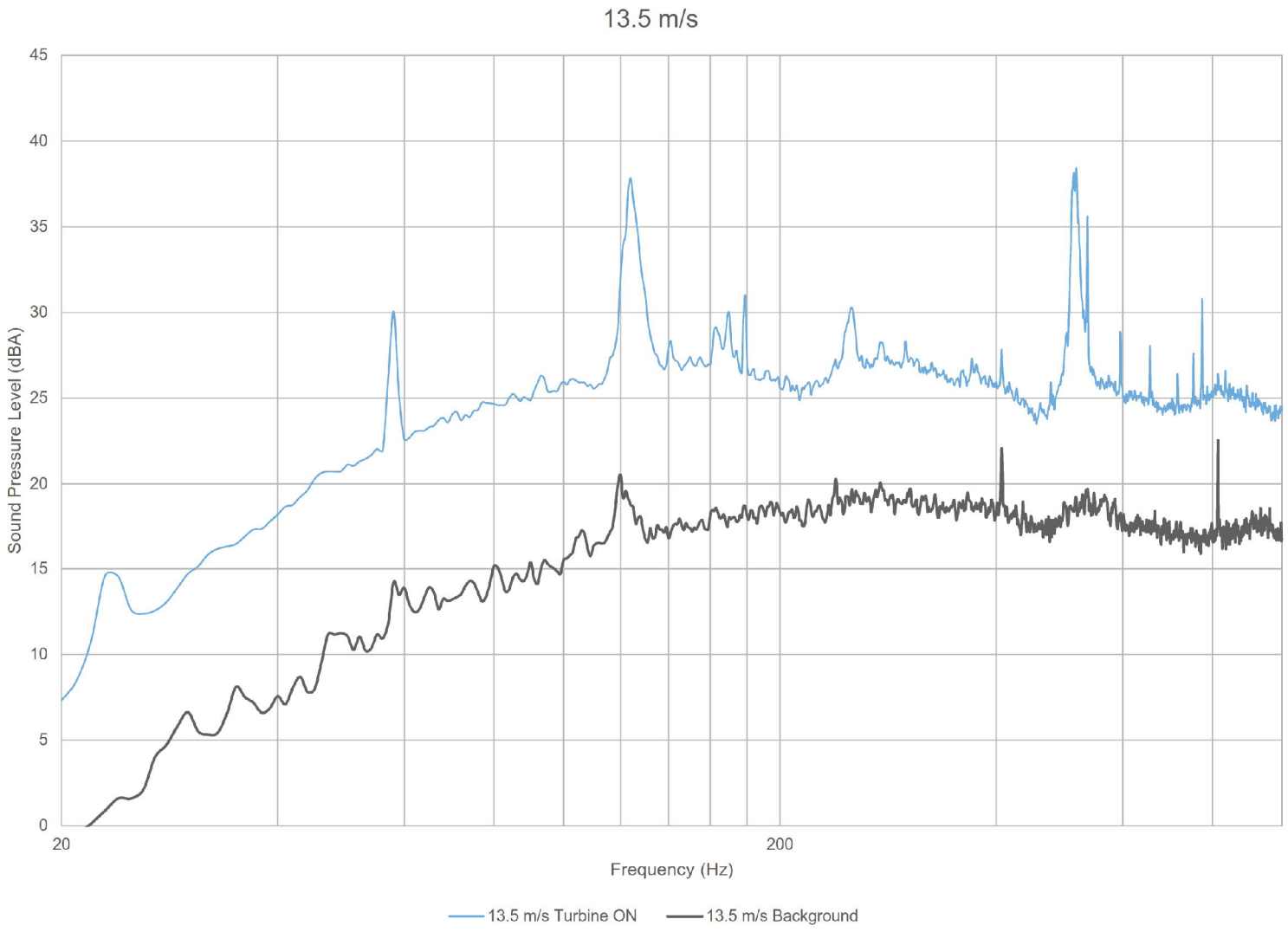
aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 12.5 m/s

Figure D.10



aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 13 m/s

Figure D.11



aercoustics	13259.00.T24.RP3 Scale: NTS Drawn by: AM Reviewed by: PA Date: Oct 11, 2017 Revision: 1	**Project Name** Summerhaven Wind Energy Centre - Turbine T24 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra – Turbine ON vs. Background at 13.5 m/s

Figure D.12

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

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
209	511			24.3	43.3	34.1	-9.2	-2.3	-6.9
509	512			24.8	43.8	42.5	-1.3	-2.3	1.0
514	513			24.2	43.1	41.0	-2.1	-2.3	0.2
506	517			24.8	43.8	42.6	-1.2	-2.3	1.1
437	522			25.1	44.1	39.5	-4.5	-2.3	-2.2
452	535			24.1	43.1	38.8	-4.4	-2.3	-2.0
468	535			24.7	43.7	38.5	-5.2	-2.3	-2.9
440	535			24.8	43.8	40.9	-2.9	-2.3	-0.6
501	535			24.2	43.2	35.4	-7.8	-2.3	-5.5
469	535			24.2	43.2	37.7	-5.6	-2.3	-3.2
435	535			24.3	43.4	35.6	-7.8	-2.3	-5.5
505	535			24.2	43.2	38.4	-4.8	-2.3	-2.5
460	535			24.9	44.0	39.7	-4.3	-2.3	-1.9
448	535			24.4	43.5	42.0	-1.4	-2.3	0.9
510	535			24.1	43.2	38.4	-4.7	-2.3	-2.4
453	535			24.3	43.3	36.2	-7.2	-2.3	-4.8
421	535			24.1	43.1	38.7	-4.4	-2.3	-2.1
436	535			24.3	43.3	34.8	-8.5	-2.3	-6.2
208	535			24.4	43.5	31.6	-11.9	-2.3	-9.6
492	535			23.8	42.8	38.2	-4.6	-2.3	-2.3
402	535			23.9	43.0	34.4	-8.6	-2.3	-6.2
779	536			26.0	45.0	35.8	-9.2	-2.3	-6.9
503	536			24.6	43.6	34.8	-8.8	-2.3	-6.4
513	536			24.4	43.4	38.5	-4.9	-2.3	-2.6
809	536			25.8	44.8	35.9	-8.9	-2.3	-6.5
Average	531						-4.9	-2.3	-2.6

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

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
446	507			24.7	43.6	39.7	-3.9	-2.3	-1.6
481	510			24.7	43.6	42.9	-0.7	-2.3	1.6
508	510			24.6	43.5	42.1	-1.4	-2.3	0.9
433	511			25.0	44.0	40.6	-3.4	-2.3	-1.1
427	512			25.1	44.1	40.3	-3.7	-2.3	-1.4
428	512			24.9	43.9	40.1	-3.8	-2.3	-1.5
401	512			24.9	43.9	43.1	-0.8	-2.3	1.5
426	513			25.1	44.1	41.3	-2.8	-2.3	-0.5
504	513			24.3	43.3	41.4	-1.9	-2.3	0.4
464	514			24.7	43.7	42.6	-1.0	-2.3	1.3
463	515			24.8	43.8	42.8	-1.0	-2.3	1.3
400	515			24.5	43.5	44.0	0.6	-2.3	2.9
482	517			24.7	43.7	43.2	-0.5	-2.3	1.8
507	517			24.6	43.6	45.1	1.6	-2.3	3.9
422	518			25.0	44.0	44.2	0.2	-2.3	2.5
419	518			25.2	44.2	42.5	-1.7	-2.3	0.7
439	535			24.9	44.0	42.3	-1.6	-2.3	0.7
491	535			23.6	42.6	38.3	-4.3	-2.3	-2.0
486	535			24.7	43.7	41.1	-2.6	-2.3	-0.3
430	535			24.5	43.5	38.1	-5.4	-2.3	-3.1
418	535			24.6	43.6	38.6	-5.0	-2.3	-2.7
449	535			24.6	43.7	41.6	-2.1	-2.3	0.2
500	535			24.2	43.2	39.7	-3.5	-2.3	-1.2
434	535			24.6	43.6	38.4	-5.2	-2.3	-2.8
467	535			24.6	43.6	39.3	-4.3	-2.3	-2.0
498	535			25.3	44.3	37.3	-7.0	-2.3	-4.7
447	535			24.2	43.2	41.1	-2.1	-2.3	0.2
465	535			25.2	44.2	42.0	-2.2	-2.3	0.1
462	535			25.1	44.1	37.9	-6.3	-2.3	-3.9
476	535			25.0	44.0	40.2	-3.7	-2.3	-1.4
749	536			26.3	45.3	38.3	-7.0	-2.3	-4.6
Average	524						-2.3	-2.3	0.0

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

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
849	121			27.5	45.8	42.4	-3.4	-2.0	-1.4
723	121			27.4	45.7	41.8	-3.9	-2.0	-1.9
628	121			27.1	45.4	48.1	2.7	-2.0	4.7
842	121			27.5	45.8	40.9	-4.9	-2.0	-2.9
722	121			27.9	46.2	47.5	1.3	-2.0	3.3
833	121			27.7	46.0	37.3	-8.7	-2.0	-6.7
753	121			27.3	45.5	41.7	-3.9	-2.0	-1.9
617	121			27.5	45.7	43.9	-1.9	-2.0	0.1
863	122			27.7	46.0	45.0	-1.0	-2.0	1.0
776	122			28.1	46.4	38.5	-7.9	-2.0	-5.9
629	124			27.6	45.8	42.6	-3.3	-2.0	-1.3
845	124			29.2	47.5	35.6	-11.8	-2.0	-9.8
740	127			27.5	45.8	35.6	-10.2	-2.0	-8.2
612	127			26.9	45.2	39.8	-5.4	-2.0	-3.4
Average	122						-2.7	-2.0	-0.7

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

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
722	490			26.0	45.0	43.6	-1.4	-2.3	0.9
776	506			26.4	45.4	45.0	-0.3	-2.3	2.0
833	508			26.1	45.0	46.3	1.3	-2.3	3.6
740	508			26.7	45.7	43.5	-2.2	-2.3	0.1
753	509			26.3	45.2	48.3	3.1	-2.3	5.4
757	510			27.2	46.1	44.5	-1.6	-2.3	0.7
844	511			27.2	46.2	46.3	0.1	-2.3	2.4
849	512			27.3	46.2	37.2	-9.1	-2.3	-6.8
629	512			26.7	45.7	44.7	-1.0	-2.3	1.3
845	512			26.8	45.8	43.6	-2.1	-2.3	0.2
723	513			26.8	45.7	46.7	1.0	-2.3	3.3
444	515			25.6	44.5	47.8	3.2	-2.3	5.5
842	516			26.4	45.4	48.2	2.8	-2.3	5.1
777	517			26.3	45.3	45.6	0.3	-2.3	2.6
804	517			26.3	45.2	45.3	0.1	-2.3	2.4
617	517			27.3	46.2	45.3	-0.9	-2.3	1.4
Average	511						0.3	-2.3	2.6

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
473	507			25.3	44.2	43.0	-1.2	-2.3	1.1
747	509			25.7	44.7	44.1	-0.6	-2.3	1.7
485	510			24.9	43.8	40.1	-3.7	-2.3	-1.4
838	511			25.0	43.9	43.0	-0.9	-2.3	1.4
424	511			24.7	43.6	43.9	0.3	-2.3	2.6
480	511			24.6	43.6	43.8	0.2	-2.3	2.5
425	511			25.1	44.1	42.7	-1.4	-2.3	1.0
839	512			25.7	44.7	42.1	-2.6	-2.3	-0.3
744	512			25.7	44.7	44.8	0.1	-2.3	2.5
417	512			25.4	44.4	43.3	-1.1	-2.3	1.3
479	512			24.2	43.2	42.7	-0.5	-2.3	1.8
410	512			24.9	43.8	42.6	-1.2	-2.3	1.1
415	512			25.0	44.0	43.6	-0.3	-2.3	2.0
451	512			24.9	43.9	43.3	-0.6	-2.3	1.7
484	513			24.8	43.7	43.8	0.0	-2.3	2.3
416	513			25.5	44.5	44.1	-0.4	-2.3	1.9
474	513			25.1	44.1	43.9	-0.2	-2.3	2.1
748	514			26.7	45.7	43.5	-2.1	-2.3	0.2
438	516			24.3	43.3	44.8	1.5	-2.3	3.8
432	516			24.7	43.7	43.3	-0.4	-2.3	1.9
423	517			24.9	43.9	45.7	1.8	-2.3	4.1
489	518			25.5	44.5	44.1	-0.4	-2.3	1.9
490	518			24.9	43.8	44.8	1.0	-2.3	3.3
431	518			24.5	43.5	43.6	0.1	-2.3	2.4
483	518			24.8	43.8	44.2	0.4	-2.3	2.7
450	518			24.5	43.4	44.2	0.7	-2.3	3.1
420	520			24.7	43.7	43.6	-0.1	-2.3	2.2
429	521			24.9	43.8	43.6	-0.3	-2.3	2.0
441	523			25.2	44.2	43.1	-1.0	-2.3	1.3
477	525			25.1	44.1	43.3	-0.8	-2.3	1.6
407	527			24.8	43.8	39.1	-4.7	-2.3	-2.3
471	529			25.4	44.4	44.1	-0.3	-2.3	2.0
750	530			26.4	45.4	41.9	-3.5	-2.3	-1.2
475	535			25.0	44.0	42.2	-1.8	-2.3	0.5
488	535			25.3	44.3	41.7	-2.6	-2.3	-0.3
461	535			25.4	44.4	43.4	-1.0	-2.3	1.3
466	535			24.9	43.9	41.4	-2.5	-2.3	-0.2
499	535			25.3	44.3	41.8	-2.6	-2.3	-0.2
743	536			26.0	45.0	40.6	-4.4	-2.3	-2.1
610	536			25.9	44.9	35.0	-9.9	-2.3	-7.6
736	536			26.8	45.8	39.7	-6.0	-2.3	-3.7
754	536			26.3	45.4	43.1	-2.3	-2.3	0.1
851	536			27.0	46.1	36.2	-9.9	-2.3	-7.6
Average	520						-1.0	-2.3	1.3

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
411	58			17.5	35.8	31.6	-4.1	-2.0	-2.1
840	58			24.1	42.4	30.9	-11.5	-2.0	-9.5
409	58			16.7	35.0	32.1	-2.9	-2.0	-0.9
408	58			17.0	35.2	31.1	-4.1	-2.0	-2.1
611	58			22.1	40.3	32.0	-8.3	-2.0	-6.3
412	58			17.4	35.6	32.9	-2.7	-2.0	-0.7
864	58			24.3	42.6	31.0	-11.6	-2.0	-9.6
478	58			19.9	38.2	30.2	-7.9	-2.0	-5.9
472	58			20.3	38.6	30.5	-8.1	-2.0	-6.1
487	58			20.5	38.7	30.3	-8.5	-2.0	-6.5
413	58			17.8	36.0	31.3	-4.8	-2.0	-2.8
414	58			17.8	36.0	33.1	-2.9	-2.0	-0.9
445	61			19.3	37.6	39.3	1.7	-2.0	3.7
443	70			19.6	37.9	37.7	-0.1	-2.0	1.9
442	74			18.8	37.1	37.3	0.2	-2.0	2.2
Average	60						-3.4	-2.0	-1.4

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
837	503			25.1	44.1	42.0	-2.0	-2.3	0.3
409	506			24.7	43.6	39.6	-4.0	-2.3	-1.7
445	510			24.6	43.6	45.6	2.0	-2.3	4.3
472	510			25.9	44.8	44.4	-0.4	-2.3	1.9
442	510			24.8	43.7	43.6	-0.1	-2.3	2.2
413	511			25.0	44.0	42.7	-1.3	-2.3	1.0
805	511			26.5	45.5	46.3	0.8	-2.3	3.1
746	511			25.9	44.8	44.2	-0.7	-2.3	1.7
803	511			25.9	44.9	47.2	2.3	-2.3	4.6
414	511			24.9	43.9	40.0	-3.8	-2.3	-1.5
412	514			25.5	44.5	42.8	-1.7	-2.3	0.7
411	514			25.7	44.7	40.7	-4.0	-2.3	-1.7
755	515			26.7	45.7	46.2	0.5	-2.3	2.8
443	515			24.9	43.9	44.6	0.8	-2.3	3.1
756	517			26.9	45.8	47.6	1.8	-2.3	4.1
778	517			26.2	45.2	47.5	2.3	-2.3	4.6
611	517			25.8	44.8	42.3	-2.5	-2.3	-0.2
852	517			27.5	46.4	43.0	-3.4	-2.3	-1.1
487	518			25.2	44.1	43.3	-0.9	-2.3	1.5
840	521			26.1	45.1	43.0	-2.0	-2.3	0.3
Average	513						-0.3	-2.3	2.0

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

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
759	510			26.4	45.3	48.7	3.3	-2.3	5.6
815	512			26.6	45.5	43.7	-1.8	-2.3	0.5
729	512			26.9	45.9	48.5	2.7	-2.3	5.0
860	513			26.4	45.4	47.8	2.4	-2.3	4.7
869	513			26.5	45.5	44.5	-1.0	-2.3	1.3
867	515			26.8	45.8	48.7	2.9	-2.3	5.2
836	515			25.9	44.9	47.3	2.4	-2.3	4.7
830	517			26.8	45.8	47.9	2.1	-2.3	4.4
613	520			26.6	45.5	43.6	-1.9	-2.3	0.4
810	524			26.7	45.6	45.4	-0.2	-2.3	2.1
846	530			27.8	46.8	42.9	-3.9	-2.3	-1.5
780	536			26.6	45.6	42.3	-3.2	-2.3	-0.9
650	536			27.6	46.6	39.3	-7.3	-2.3	-4.9
Average	519						0.7	-2.3	3.0

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
817	120			28.5	46.8	46.8	0.0	-2.0	2.0
739	121			27.7	46.0	38.7	-7.3	-2.0	-5.3
832	121			28.2	46.5	38.0	-8.4	-2.0	-6.4
807	121			27.2	45.5	44.0	-1.5	-2.0	0.5
812	121			27.9	46.2	43.5	-2.7	-2.0	-0.7
649	121			27.6	45.9	47.8	1.9	-2.0	3.9
786	122			28.7	47.0	44.7	-2.3	-2.0	-0.3
915	122			25.8	44.1	44.8	0.7	-2.0	2.7
685	123			27.6	45.9	44.7	-1.2	-2.0	0.8
856	123			27.4	45.6	40.5	-5.1	-2.0	-3.1
910	123			27.7	46.0	44.4	-1.6	-2.0	0.4
916	123			28.0	46.3	41.9	-4.5	-2.0	-2.5
861	123			28.3	46.6	41.4	-5.3	-2.0	-3.2
926	123			28.4	46.6	43.6	-3.0	-2.0	-1.0
635	124			27.4	45.7	42.9	-2.7	-2.0	-0.7
898	124			27.2	45.5	42.4	-3.1	-2.0	-1.1
886	124			28.3	46.6	35.3	-11.3	-2.0	-9.3
625	124			26.9	45.2	43.0	-2.1	-2.0	-0.1
824	124			28.4	46.7	40.9	-5.9	-2.0	-3.8
619	124			27.1	45.4	44.0	-1.4	-2.0	0.7
887	125			26.6	44.9	37.8	-7.1	-2.0	-5.0
607	125			26.7	44.9	38.7	-6.2	-2.0	-4.2
854	126			26.6	44.9	36.8	-8.1	-2.0	-6.1
763	126			28.4	46.7	38.1	-8.6	-2.0	-6.6
806	127			27.7	46.0	40.8	-5.1	-2.0	-3.1
865	127			28.3	46.5	34.5	-12.1	-2.0	-10.0
719	127			28.7	47.0	41.7	-5.3	-2.0	-3.3
765	127			27.5	45.8	40.1	-5.7	-2.0	-3.7
Average	124						-3.3	-2.0	-1.3

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
817	499			26.1	45.0	46.9	1.9	-2.3	4.2
807	500			25.9	44.8	43.9	-0.9	-2.3	1.4
786	505			26.2	45.1	48.0	2.8	-2.3	5.1
763	505			26.6	45.5	45.1	-0.4	-2.3	1.9
649	505			26.5	45.5	46.6	1.1	-2.3	3.4
910	506			26.9	45.9	48.6	2.7	-2.3	5.0
739	509			26.2	45.2	45.2	0.1	-2.3	2.4
926	509			26.2	45.2	46.8	1.6	-2.3	3.9
856	510			26.7	45.7	47.2	1.5	-2.3	3.8
916	511			27.0	46.0	48.6	2.6	-2.3	4.9
861	511			26.6	45.6	47.8	2.2	-2.3	4.5
915	511			25.4	44.4	47.1	2.7	-2.3	5.0
758	511			26.6	45.6	45.6	0.0	-2.3	2.3
765	512			25.9	44.8	45.2	0.3	-2.3	2.6
619	512			26.4	45.4	48.0	2.6	-2.3	4.9
685	512			26.1	45.0	46.0	0.9	-2.3	3.3
886	512			26.6	45.5	47.0	1.4	-2.3	3.8
625	512			26.5	45.5	47.5	2.1	-2.3	4.4
865	512			26.4	45.3	46.8	1.4	-2.3	3.7
775	512			26.3	45.3	49.0	3.7	-2.3	6.0
898	513			26.2	45.2	47.9	2.7	-2.3	5.0
832	514			26.5	45.5	48.1	2.6	-2.3	4.9
824	516			26.4	45.4	45.5	0.1	-2.3	2.4
635	517			26.2	45.2	47.6	2.4	-2.3	4.7
719	517			26.8	45.8	45.5	-0.3	-2.3	2.0
887	518			25.8	44.8	44.8	0.0	-2.3	2.3
812	519			26.3	45.3	48.2	2.9	-2.3	5.2
607	520			27.4	46.4	46.2	-0.2	-2.3	2.1
854	521			26.0	44.9	44.1	-0.8	-2.3	1.5
806	521			26.4	45.4	44.5	-0.9	-2.3	1.4
Average	512						1.5	-2.3	3.8

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

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
734	119			27.1	45.4	46.3	0.8	-2.0	2.8
609	120			25.7	44.0	43.9	-0.1	-2.0	1.9
801	121			27.1	45.4	46.6	1.2	-2.0	3.2
654	121			26.8	45.1	45.1	0.0	-2.0	2.0
825	123			28.1	46.4	39.7	-6.7	-2.0	-4.7
795	123			27.4	45.7	44.6	-1.1	-2.0	0.9
870	123			28.6	46.9	39.2	-7.6	-2.0	-5.6
858	123			27.1	45.4	39.8	-5.6	-2.0	-3.6
630	124			26.7	45.0	42.8	-2.2	-2.0	-0.2
796	124			28.6	46.8	43.3	-3.6	-2.0	-1.6
859	124			26.6	44.9	40.3	-4.6	-2.0	-2.6
792	124			26.9	45.1	40.8	-4.4	-2.0	-2.4
823	124			27.5	45.7	43.1	-2.6	-2.0	-0.6
897	124			27.9	46.2	42.7	-3.5	-2.0	-1.5
752	124			27.7	46.0	38.6	-7.4	-2.0	-5.4
814	124			27.7	45.9	39.0	-7.0	-2.0	-5.0
636	125			27.3	45.6	41.6	-4.0	-2.0	-2.0
762	125			28.1	46.4	38.1	-8.4	-2.0	-6.3
714	125			27.1	45.4	41.4	-4.0	-2.0	-2.0
875	125			26.3	44.6	39.0	-5.6	-2.0	-3.6
868	126			28.8	47.1	38.2	-8.9	-2.0	-6.9
922	126			26.6	44.9	41.8	-3.1	-2.0	-1.1
732	126			27.5	45.8	40.6	-5.2	-2.0	-3.2
908	127			28.4	46.7	40.4	-6.3	-2.0	-4.3
Average	123.75						-3.2	-2.0	-1.2

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

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
752	506			26.3	45.2	48.0	2.8	-2.3	5.1
823	511			27.0	46.0	48.8	2.8	-2.3	5.1
630	512			26.5	45.5	47.3	1.8	-2.3	4.1
654	512			26.9	45.8	46.0	0.2	-2.3	2.5
825	512			26.8	45.8	50.3	4.5	-2.3	6.8
814	512			26.5	45.5	48.3	2.8	-2.3	5.1
908	512			26.8	45.8	49.4	3.6	-2.3	5.9
762	512			25.9	44.9	49.8	4.9	-2.3	7.2
858	512			26.5	45.4	47.4	2.0	-2.3	4.3
732	513			25.7	44.7	47.6	3.0	-2.3	5.3
796	513			27.0	45.9	48.4	2.5	-2.3	4.8
792	513			26.0	45.0	48.1	3.1	-2.3	5.4
795	513			26.0	44.9	47.9	3.0	-2.3	5.3
922	513			26.8	45.8	45.7	-0.1	-2.3	2.2
897	514			26.4	45.4	47.4	2.0	-2.3	4.3
609	514			26.4	45.3	48.6	3.3	-2.3	5.6
801	516			27.0	46.0	47.3	1.3	-2.3	3.6
714	516			26.0	45.0	47.4	2.4	-2.3	4.8
870	516			26.7	45.7	46.7	1.0	-2.3	3.4
859	517			26.3	45.3	48.1	2.9	-2.3	5.2
636	517			26.2	45.2	46.4	1.2	-2.3	3.5
634	518			27.0	46.0	41.5	-4.5	-2.3	-2.2
868	518			26.9	45.9	47.5	1.7	-2.3	4.0
875	520			26.0	45.0	46.5	1.6	-2.3	3.9
Average	514						2.4	-2.3	4.7

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
787	120			27.8	46.1	48.2	2.2	-2.0	4.2
799	121			27.0	45.3	45.6	0.3	-2.0	2.3
721	121			27.3	45.6	46.2	0.6	-2.0	2.6
827	121			28.8	47.0	44.8	-2.3	-2.0	-0.3
878	121			28.2	46.4	43.2	-3.3	-2.0	-1.2
727	121			27.6	45.9	43.7	-2.2	-2.0	-0.2
717	121			26.3	44.6	47.2	2.7	-2.0	4.7
925	123			27.7	46.0	43.4	-2.6	-2.0	-0.6
627	123			26.4	44.7	45.0	0.3	-2.0	2.3
698	123			26.5	44.8	43.4	-1.4	-2.0	0.6
716	123			26.7	45.0	42.0	-3.0	-2.0	-1.0
689	124			27.1	45.4	42.3	-3.0	-2.0	-1.0
781	124			28.0	46.3	39.1	-7.1	-2.0	-5.1
826	124			27.7	46.0	41.5	-4.5	-2.0	-2.5
655	124			26.0	44.3	42.8	-1.5	-2.0	0.5
728	124			27.9	46.2	44.7	-1.4	-2.0	0.6
798	124			27.7	46.0	41.9	-4.1	-2.0	-2.1
793	124			28.4	46.6	43.3	-3.3	-2.0	-1.3
656	124			25.8	44.1	43.3	-0.9	-2.0	1.2
791	124			26.3	44.5	41.9	-2.6	-2.0	-0.6
820	124			27.1	45.4	42.0	-3.4	-2.0	-1.4
782	124			27.9	46.2	41.9	-4.3	-2.0	-2.3
631	124			27.0	45.3	42.4	-2.9	-2.0	-0.8
831	124			28.4	46.7	35.6	-11.1	-2.0	-9.1
880	126			27.0	45.3	37.9	-7.4	-2.0	-5.4
855	126			26.7	45.0	38.5	-6.6	-2.0	-4.6
764	126			27.5	45.8	37.6	-8.2	-2.0	-6.2
720	126			28.1	46.3	42.8	-3.5	-2.0	-1.5
800	126			27.8	46.1	42.5	-3.6	-2.0	-1.6
699	126			26.0	44.3	44.1	-0.2	-2.0	1.8
760	126			28.2	46.5	40.2	-6.3	-2.0	-4.3
902	127			27.7	46.0	43.3	-2.8	-2.0	-0.8
745	127			27.6	45.9	38.5	-7.4	-2.0	-5.4
696	127			26.8	45.1	43.7	-1.5	-2.0	0.5
606	127			26.0	44.3	40.9	-3.4	-2.0	-1.4
620	128			26.6	44.9	43.0	-2.0	-2.0	0.0
Average	124						-2.2	-2.0	-0.2

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
787	495			26.5	45.4	44.2	-1.2	-2.3	1.0
717	506			25.6	44.5	46.3	1.8	-2.3	4.1
627	508			27.3	46.3	47.4	1.1	-2.3	3.4
843	508			26.0	44.9	47.8	2.9	-2.3	5.2
781	510			26.3	45.2	43.5	-1.8	-2.3	0.5
793	510			26.5	45.5	51.0	5.5	-2.3	7.8
720	510			26.0	44.9	45.8	0.9	-2.3	3.2
826	511			26.4	45.4	46.9	1.5	-2.3	3.8
925	511			26.5	45.4	48.2	2.7	-2.3	5.1
782	512			25.7	44.7	47.2	2.5	-2.3	4.8
827	512			27.8	46.8	48.6	1.8	-2.3	4.2
721	512			26.6	45.6	47.3	1.8	-2.3	4.1
689	512			27.7	46.6	51.0	4.4	-2.3	6.7
716	512			25.9	44.9	49.1	4.2	-2.3	6.5
696	513			26.1	45.0	46.4	1.3	-2.3	3.7
655	513			26.0	45.0	47.6	2.6	-2.3	4.9
831	513			26.7	45.7	51.2	5.5	-2.3	7.8
880	513			25.5	44.4	51.3	6.9	-2.3	9.2
631	513			26.8	45.7	48.6	2.8	-2.3	5.1
727	513			26.3	45.2	48.1	2.9	-2.3	5.2
728	514			26.3	45.2	49.0	3.7	-2.3	6.0
699	514			26.9	45.8	45.9	0.1	-2.3	2.4
820	514			25.9	44.9	47.7	2.8	-2.3	5.1
902	514			26.8	45.7	46.5	0.8	-2.3	3.1
791	516			25.3	44.3	47.4	3.1	-2.3	5.4
764	517			25.7	44.7	46.6	1.8	-2.3	4.2
855	517			26.6	45.6	45.6	0.0	-2.3	2.3
698	519			26.2	45.2	46.9	1.7	-2.3	4.0
798	519			26.7	45.7	49.3	3.6	-2.3	6.0
800	520			27.1	46.1	45.7	-0.4	-2.3	1.9
656	520			26.3	45.2	48.9	3.6	-2.3	5.9
606	521			26.4	45.3	46.9	1.5	-2.3	3.9
760	522			26.9	45.9	45.5	-0.4	-2.3	2.0
745	523			26.5	45.4	44.4	-1.1	-2.3	1.3
Average	513						2.5	-2.3	4.9

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
877	121			27.3	45.6	45.4	-0.2	-2.0	1.8
616	121			26.8	45.1	46.9	1.9	-2.0	3.9
866	123			28.3	46.6	38.4	-8.2	-2.0	-6.2
911	123			28.3	46.6	41.5	-5.0	-2.0	-3.0
647	123			26.3	44.6	45.0	0.4	-2.0	2.4
632	123			27.1	45.4	42.9	-2.5	-2.0	-0.5
924	123			26.6	44.9	44.1	-0.8	-2.0	1.2
697	123			25.3	43.5	44.2	0.6	-2.0	2.7
797	123			28.5	46.8	43.6	-3.2	-2.0	-1.2
657	124			25.4	43.7	45.1	1.4	-2.0	3.4
648	124			27.2	45.5	43.2	-2.3	-2.0	-0.3
705	124			28.0	46.3	42.1	-4.2	-2.0	-2.2
633	124			27.7	46.0	42.0	-4.0	-2.0	-2.0
652	124			27.3	45.6	42.6	-2.9	-2.0	-0.9
715	124			25.9	44.2	40.7	-3.5	-2.0	-1.5
818	124			29.2	47.5	35.5	-12.0	-2.0	-10.0
821	124			28.5	46.8	39.8	-7.0	-2.0	-5.0
909	124			27.8	46.1	41.1	-5.0	-2.0	-3.0
895	124			27.3	45.6	41.5	-4.1	-2.0	-2.1
660	124			25.2	43.5	44.9	1.4	-2.0	3.4
785	124			27.9	46.2	42.0	-4.2	-2.0	-2.2
788	124			28.4	46.7	42.7	-4.0	-2.0	-2.0
623	124			26.0	44.3	42.0	-2.2	-2.0	-0.2
695	125			27.1	45.4	42.9	-2.5	-2.0	-0.5
848	125			28.2	46.5	37.2	-9.3	-2.0	-7.3
730	125			28.3	46.6	39.9	-6.7	-2.0	-4.7
923	125			27.0	45.2	43.4	-1.8	-2.0	0.2
819	126			27.4	45.6	42.3	-3.3	-2.0	-1.3
726	126			27.6	45.9	40.9	-5.0	-2.0	-3.0
626	126			25.9	44.2	43.6	-0.6	-2.0	1.4
614	127			26.7	44.9	41.1	-3.8	-2.0	-1.8
691	127			26.6	44.9	41.6	-3.3	-2.0	-1.3
811	127			27.3	45.6	37.4	-8.2	-2.0	-6.2
841	127			28.2	46.4	37.0	-9.4	-2.0	-7.4
618	127			27.4	45.7	41.4	-4.3	-2.0	-2.3
651	128			28.0	46.3	43.4	-2.9	-2.0	-0.9
	124						-2.6	-2.0	-0.6

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

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
877	508			25.7	44.6	47.3	2.7	-2.3	5.0
924	510			25.8	44.8	48.9	4.2	-2.3	6.5
911	511			26.6	45.5	45.9	0.4	-2.3	2.7
866	512			26.4	45.4	47.9	2.5	-2.3	4.8
616	512			26.3	45.3	47.7	2.5	-2.3	4.8
632	512			26.3	45.3	48.5	3.2	-2.3	5.5
660	512			25.5	44.5	46.5	2.1	-2.3	4.4
797	512			26.6	45.6	47.6	2.1	-2.3	4.4
785	512			26.5	45.5	49.7	4.2	-2.3	6.6
841	512			25.4	44.4	48.6	4.2	-2.3	6.5
909	512			26.2	45.1	47.4	2.2	-2.3	4.6
821	512			26.3	45.2	48.8	3.5	-2.3	5.9
623	513			25.9	44.8	46.8	1.9	-2.3	4.3
657	513			25.7	44.7	48.3	3.7	-2.3	6.0
652	513			26.2	45.2	49.1	3.9	-2.3	6.2
697	513			25.6	44.6	46.2	1.7	-2.3	4.0
647	513			25.9	44.8	50.7	5.8	-2.3	8.2
788	513			26.5	45.4	47.1	1.6	-2.3	3.9
705	513			27.2	46.1	47.0	0.8	-2.3	3.2
715	513			25.4	44.4	48.5	4.1	-2.3	6.4
633	514			27.7	46.6	50.5	3.9	-2.3	6.2
730	516			27.1	46.1	46.8	0.7	-2.3	3.0
811	516			26.5	45.4	48.9	3.5	-2.3	5.8
691	517			25.7	44.7	47.7	3.0	-2.3	5.3
648	517			25.7	44.6	49.5	4.9	-2.3	7.2
848	517			26.9	45.8	46.1	0.3	-2.3	2.6
695	517			27.2	46.1	47.0	0.9	-2.3	3.2
895	517			26.1	45.1	47.7	2.6	-2.3	4.9
614	520			26.0	45.0	44.9	-0.1	-2.3	2.2
819	520			26.5	45.5	45.1	-0.4	-2.3	1.9
626	521			25.3	44.2	47.2	3.0	-2.3	5.3
726	521			26.8	45.8	43.0	-2.8	-2.3	-0.5
618	521			26.5	45.5	46.1	0.6	-2.3	3.0
651	533			26.5	45.5	43.1	-2.4	-2.3	0.0
818	536			27.3	46.3	46.0	-0.3	-2.3	2.0
Average	516						2.5	-2.3	4.8

Table D.12 Tonality Assessment Table - 13.5 m/s

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
725	121			28.3	46.6	44.4	-2.2	-2.0	-0.2
813	121			27.9	46.2	44.3	-1.9	-2.0	0.1
930	122			27.2	45.5	44.8	-0.7	-2.0	1.3
929	123			26.8	45.1	43.5	-1.5	-2.0	0.5
885	123			28.3	46.5	37.8	-8.8	-2.0	-6.8
913	123			26.3	44.6	42.9	-1.8	-2.0	0.3
693	123			25.9	44.2	43.7	-0.5	-2.0	1.5
901	123			26.9	45.2	43.8	-1.4	-2.0	0.6
904	123			26.9	45.2	42.6	-2.6	-2.0	-0.6
702	124			28.1	46.4	43.8	-2.5	-2.0	-0.5
894	124			26.0	44.3	41.6	-2.7	-2.0	-0.7
712	124			26.8	45.1	43.1	-2.0	-2.0	0.0
658	124			25.8	44.1	43.9	-0.1	-2.0	1.9
659	124			25.4	43.7	44.0	0.3	-2.0	2.3
888	125			27.1	45.3	37.3	-8.1	-2.0	-6.1
889	125			27.0	45.3	40.1	-5.2	-2.0	-3.2
881	125			27.3	45.6	41.2	-4.4	-2.0	-2.4
917	126			27.2	45.5	39.9	-5.6	-2.0	-3.6
707	126			26.3	44.6	43.8	-0.8	-2.0	1.2
914	126			26.6	44.9	40.9	-4.1	-2.0	-2.0
931	126			28.2	46.5	39.3	-7.1	-2.0	-5.1
741	127			27.6	45.8	38.8	-7.1	-2.0	-5.1
686	128			26.0	44.3	41.5	-2.8	-2.0	-0.8
Average	124						-2.6	-2.0	-0.5

Table D.12 Tonality Assessment Table - 13.5 m/s

Project: Summerhaven Wind Energy Centre- Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
693	507			26.7	45.7	46.5	0.8	-2.3	3.2
913	510			25.5	44.4	47.7	3.3	-2.3	5.6
901	510			26.2	45.2	47.6	2.4	-2.3	4.7
712	510			26.2	45.1	50.0	4.8	-2.3	7.1
885	512			27.2	46.1	49.6	3.5	-2.3	5.8
930	513			27.8	46.7	46.0	-0.8	-2.3	1.5
658	513			25.5	44.5	46.8	2.3	-2.3	4.6
894	514			25.7	44.7	48.5	3.8	-2.3	6.1
702	514			28.1	47.0	46.7	-0.3	-2.3	2.0
904	516			27.2	46.2	47.4	1.2	-2.3	3.6
881	516			27.0	46.0	50.5	4.5	-2.3	6.8
889	516			24.4	43.3	45.3	2.0	-2.3	4.3
929	517			27.0	46.0	46.1	0.0	-2.3	2.4
917	517			25.4	44.4	46.6	2.3	-2.3	4.6
888	517			25.1	44.1	44.8	0.7	-2.3	3.0
659	518			26.0	44.9	48.8	3.8	-2.3	6.2
725	519			27.5	46.5	43.9	-2.6	-2.3	-0.3
707	521			25.3	44.3	46.4	2.1	-2.3	4.4
931	521			27.0	46.0	47.0	1.1	-2.3	3.4
914	523			26.5	45.5	49.2	3.7	-2.3	6.0
686	527			26.2	45.2	43.1	-2.2	-2.3	0.2
813	530			26.1	45.1	45.1	0.0	-2.3	2.3
741	533			26.0	45.0	45.5	0.5	-2.3	2.8
Average	517						2.0	-2.3	4.4

Table D.11 Tonality Assessment Table - 13 m/s

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
724	121			28.0	46.3	43.5	-2.9	-2.0	-0.8
742	122			27.0	45.3	43.9	-1.4	-2.0	0.6
876	123			27.0	45.3	40.1	-5.2	-2.0	-3.2
761	123			28.5	46.8	38.3	-8.5	-2.0	-6.5
921	123			26.4	44.7	42.8	-1.9	-2.0	0.1
694	123			26.1	44.4	44.6	0.2	-2.0	2.2
615	124			26.1	44.4	42.9	-1.5	-2.0	0.5
896	124			27.4	45.7	41.9	-3.8	-2.0	-1.8
784	124			27.6	45.9	40.2	-5.6	-2.0	-3.6
713	124			27.7	46.0	41.2	-4.8	-2.0	-2.8
690	124			26.4	44.7	42.6	-2.1	-2.0	-0.1
688	124			26.3	44.6	43.2	-1.4	-2.0	0.6
783	125			27.5	45.8	40.9	-4.9	-2.0	-2.9
822	126			27.9	46.1	39.0	-7.2	-2.0	-5.2
731	126			27.1	45.4	38.9	-6.5	-2.0	-4.5
706	126			28.3	46.6	43.8	-2.9	-2.0	-0.8
857	126			27.7	46.0	39.9	-6.1	-2.0	-4.1
873	127			29.1	47.4	39.6	-7.8	-2.0	-5.8
874	127			28.7	47.0	40.7	-6.3	-2.0	-4.3
Average	124						-3.6	-2.0	-1.6

Table D.11 Tonality Assessment Table - 13 m/s

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
694	508			26.8	45.8	48.6	2.9	-2.3	5.2
761	508			26.1	45.0	49.0	3.9	-2.3	6.3
921	510			27.3	46.2	47.1	0.9	-2.3	3.2
713	511			26.6	45.6	51.6	6.0	-2.3	8.3
615	512			25.3	44.2	48.4	4.2	-2.3	6.5
688	512			26.5	45.4	47.6	2.2	-2.3	4.5
876	512			26.4	45.4	49.4	4.0	-2.3	6.3
822	513			26.9	45.9	49.9	4.0	-2.3	6.3
857	514			26.2	45.2	47.1	1.8	-2.3	4.2
706	514			26.1	45.1	49.4	4.3	-2.3	6.6
724	515			26.7	45.7	48.2	2.5	-2.3	4.9
784	517			26.4	45.4	47.4	2.0	-2.3	4.3
783	517			26.0	45.0	46.7	1.7	-2.3	4.0
896	517			27.1	46.1	48.9	2.8	-2.3	5.1
742	517			26.4	45.4	46.7	1.2	-2.3	3.6
690	520			26.7	45.6	49.5	3.9	-2.3	6.2
731	521			26.3	45.2	44.2	-1.0	-2.3	1.3
874	523			26.5	45.5	44.1	-1.4	-2.3	0.9
873	524			27.0	45.9	45.0	-1.0	-2.3	1.4
Average	515						2.8	-2.3	5.1

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Appendix E
Measurement Data

Table E.01 Measurement data - Turbine ON

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
1	6.0	48.4	379	292.0	281.7	0.5	11.1	3.2	4.3	8	98.8	73
2	5.5	47.1	306	292.0	277.7	0.5	10.0	4.4	4.1	8	98.8	73
3	5.1	46.2	236	292.0	277.0	0.5	8.8	4.0	4.2	8	98.8	73
4	4.8	45.0	184	292.0	277.6	0.5	8.0	3.8	4.4	8	98.8	73
5	4.4	44.4	147	292.0	279.9	1.1	7.7	3.2	3.9	8	98.8	73
6	4.6	44.7	168	292.0	282.1	1.5	7.8	5.1	3.4	8	98.8	74
7	4.6	45.5	172	292.0	282.5	1.5	7.9	4.8	3.5	8	98.8	74
8	4.6	46.1	165	292.0	282.5	1.5	7.8	4.8	4.3	8	98.8	74
9	4.6	45.7	171	292.0	282.4	1.5	7.9	5.5	4.5	8	98.8	74
10	4.7	45.5	172	292.0	282.4	1.5	7.9	4.9	4.3	8	98.8	74
11			142	292.0	283.4	1.2	7.6	4.7	4.6	8	98.8	74
12			75	292.0	285.9	0.5	7.3	4.4	4.3	8	98.8	72
13			33	292.0	288.2	0.5	7.1	2.8	4.6	8	98.8	72
14			30	292.0	288.6	0.5	7.1	2.0	4.2	8	98.8	72
15	3.6	44.3	56	292.0	287.6	0.5	7.2	2.7	4.0	8	98.8	72
16	4.1	44.6	107	292.0	286.0	0.5	7.4	4.1	3.6	8	98.8	72
17	4.3	44.6	133	292.0	285.9	1.0	7.5	3.5	3.6	8	98.8	72
18	4.8	45.3	187	292.0	285.9	1.5	8.0	3.5	4.2	8	98.8	74
19	5.3	45.7	266	292.0	285.9	1.5	9.1	6.5	4.2	8	98.8	74
20	5.7	47.1	341	292.0	285.9	1.5	10.5	6.6	4.3	8	98.8	74
21	6.0	48.2	393	292.0	285.9	1.5	11.2	5.3	4.1	8	98.8	74
22	6.3	48.8	451	292.0	287.0	1.5	11.7	6.5	3.8	8	98.8	74
23	6.9	49.7	595	292.0	287.6	1.3	12.9	7.2	3.8	8	98.8	74
24	7.3	51.5	724	292.0	287.6	0.5	13.9	6.7	3.4	8	98.8	75
25	7.2	51.7	703	292.0	287.6	0.5	13.7	5.6	3.2	8	98.8	75
26	7.2	51.2	690	292.0	287.7	0.5	13.6	6.3	3.4	8	98.8	75
27	7.1	51.5	669	292.0	287.7	0.5	13.4	6.6	3.7	8	98.8	75
28	6.6	50.9	529	292.0	287.7	0.5	12.4	6.4	4.3	8	98.8	75
29	6.1	49.2	402	292.0	288.3	0.8	11.3	5.4	5.7	8	98.8	75
30			359	292.0	289.1	1.5	10.9	6.1	6.6	8	98.8	73
31			360	292.0	289.2	1.5	10.8	6.4	6.3	8	98.8	73
32	5.7	47.8	333	292.0	289.2	1.5	10.4	5.9	5.1	8	98.8	73
33	5.5	46.4	293	292.0	289.2	1.5	9.7	4.0	5.3	8	98.8	73
34	5.4	46.2	279	292.0	289.2	1.5	9.5	4.7	5.2	8	98.8	73
35	5.4	46.3	287	292.0	289.2	1.4	9.6	5.9	4.9	8	98.8	73
36	5.5	46.5	297	292.0	289.2	0.5	9.8	5.1	5.0	8	98.8	73
37	5.5	46.7	301	292.0	289.2	0.5	9.9	5.4	4.5	8	98.8	73
38	5.4	46.3	285	292.0	289.2	0.5	9.7	5.3	4.1	8	98.8	73
39	5.3	45.8	272	292.0	289.2	0.5	9.4	6.0	3.9	8	98.8	73
40	5.3	45.9	259	292.0	289.2	0.5	9.2	5.8	3.5	8	98.8	73
41	5.3	45.5	272	292.0	289.2	0.7	9.4	6.4	4.1	8	98.8	73
42	5.5	46.0	299	292.0	289.7	1.5	9.9	6.2	3.9	8	98.8	73
43	5.6	46.7	309	292.0	290.2	1.5	10.0	5.3	3.8	8	98.8	74
44	5.4	46.5	286	292.0	290.3	1.5	9.6	4.3	3.8	8	98.8	74
45	5.2	46.0	245	292.0	290.3	1.5	9.0	4.1	3.4	8	98.8	74
46	5.1	45.1	234	292.0	290.3	1.5	8.8	5.0	4.2	8	98.8	74
47			269	292.0	290.3	1.5	9.3	5.6	5.5	8	98.8	74
48	5.5	46.0	296	292.0	290.3	0.5	9.8	5.5	4.8	8	98.8	72
49	5.7	46.5	331	292.0	290.3	0.5	10.4	5.4	5.2	8	98.8	72
50	6.1	47.7	399	292.0	290.3	0.5	11.3	6.3	5.5	8	98.8	72
51	6.2	48.7	441	292.0	290.2	0.5	11.7	5.3	4.9	8	98.8	72
52	6.3	49.0	448	292.0	288.8	0.5	11.7	5.6	4.4	8	98.8	72
53	6.1	50.4	399	292.0	286.2	0.6	11.3	4.9	5.1	8	98.8	72
54	5.7	48.0	341	292.0	285.0	1.5	10.6	5.6	5.0	8	98.8	72
55	5.5	47.1	299	292.0	285.0	1.5	9.8	4.8	5.2	8	98.8	72
56	5.3	46.2	267	292.0	285.0	1.5	9.3	3.5	4.9	8	98.8	72
57	5.3	46.2	260	292.0	285.0	1.5	9.3	3.4	4.8	8	98.8	72
58	5.3	46.4	266	292.0	286.2	1.5	9.4	3.8	4.7	8	98.8	72
59	5.5	47.3	290	292.0	288.3	1.5	9.7	5.3	4.6	8	98.8	72
60	5.7	47.5	327	292.0	288.7	0.6	10.3	6.0	4.0	8	98.8	74
61	6.0	47.9	386	292.0	288.7	0.5	11.2	6.4	4.5	8	98.8	74
62	6.1	49.2	419	292.0	288.7	0.5	11.5	6.4	4.7	8	98.8	74
63	5.9	49.4	376	292.0	289.5	0.5	11.1	4.7	5.0	8	98.8	74
64	5.8	48.3	344	292.0	291.9	0.5	10.7	5.4	5.6	8	98.8	74
65			322	292.0	293.0	0.5	10.2	4.2	6.1	8	98.8	74
66			280	292.0	293.0	1.4	9.5	3.4	5.8	8	98.8	71
67			267	292.0	293.0	1.5	9.3	5.5	5.6	8	98.8	70
68	5.3	46.4	262	292.0	293.0	1.5	9.2	4.7	5.1	8	98.8	70
69			242	292.0	293.0	1.5	9.0	4.7	5.4	8	98.8	70
70	5.1	45.5	228	292.0	293.0	1.5	8.7	4.2	4.5	8	98.8	70
71	4.9	45.5	205	292.0	293.0	1.5	8.2	3.9	4.3	8	98.8	70
72	4.8	45.6	184	292.0	293.0	0.7	8.0	3.7	4.6	8	98.8	71
73			199	292.0	293.0	0.5	8.2	5.0	5.8	8	98.8	72
74			221	292.0	293.0	0.5	8.4	4.2	5.2	8	98.8	72
75			219	292.0	293.0	0.5	8.4	4.0	5.2	8	98.8	72
76			217	292.0	293.0	0.5	8.4	4.3	5.5	8	98.8	72
77	5.1	45.6	228	292.0	292.8	0.5	8.7	3.8	4.1	8	98.8	72
78	5.2	45.6	253	292.0	290.8	1.4	9.2	4.1	3.9	8	98.8	73
79	5.4	46.5	287	292.0	288.3	1.5	9.7	5.0	4.5	8	98.8	73
80	5.6	46.9	311	292.0	287.7	1.5	10.1	4.6	3.7	8	98.8	73
81	5.6	47.6	308	292.0	287.7	1.5	10.0	5.1	3.2	8	98.8	73
82	5.5	48.1	295	292.0	287.8	1.5	9.9	5.9	3.8	8	98.8	73
83	5.6	47.1	310	292.0	289.4	1.5	10.1	5.9	4.3	8	98.8	73
84	5.7	47.3	328	292.0	290.7	0.9	10.4	5.2	4.6	8	98.8	73
85	5.5	47.4	305	292.0	290.8	0.5	10.0	5.1	4.8	8	98.8	73
86	5.4	47.1	282	292.0	290.8	0.5	9.6	5.3	4.4	8	98.8	73
87	5.4	46.9	288	292.0	290.8	0.5	9.6	5.8	4.7	8	98.8	73
88	5.5	47.4	300	292.0	290.8	0.5	9.8	5.3	5.2	8	98.8	73

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
89	5.5	47.4	305	292.0	290.8	0.5	10.0	4.8	5.1	8	98.8	73
90	5.5	47.0	301	292.0	290.8	1.3	9.9	4.7	5.0	8	98.8	72
91	5.6	47.1	307	292.0	290.8	1.5	10.0	4.9	4.6	8	98.8	71
92	5.4	46.6	290	292.0	290.8	1.5	9.8	4.3	4.3	8	98.8	71
93	5.3	46.4	264	292.0	290.8	1.5	9.3	5.2	2.9	8	98.8	71
94	5.0	45.6	213	292.0	292.4	1.5	8.5	4.1	3.7	8	98.8	71
95	4.7	45.3	175	292.0	295.0	1.5	8.0	4.4	4.2	8	98.8	71
96	4.7	44.8	178	292.0	296.3	1.0	8.0	4.8	4.6	8	98.8	73
97			175	292.0	296.3	0.5	7.9	3.8	5.1	8	98.8	74
98			186	292.0	296.3	0.5	8.0	4.7	5.9	8	98.8	74
99			206	292.0	296.3	0.5	8.3	4.3	6.0	8	98.8	74
100			250	292.0	296.3	0.5	9.0	6.5	5.7	8	98.8	74
101	5.7	46.1	326	292.0	296.3	0.5	10.3	6.7	5.0	8	98.8	74
102	6.0	47.2	386	292.0	296.4	1.2	11.1	5.6	5.6	8	98.8	72
103	6.2	48.4	426	292.0	296.4	1.5	11.5	4.7	5.3	8	98.8	72
104	6.2	48.4	435	292.0	296.3	1.5	11.6	5.2	6.0	8	98.8	72
105	6.1	48.5	419	292.0	295.1	1.5	11.4	5.2	5.0	8	98.8	72
106	5.9	47.5	367	292.0	293.8	1.5	10.9	5.7	4.4	8	98.8	72
107	5.8	47.1	346	292.0	293.7	1.5	10.7	5.4	4.2	8	98.8	72
108	5.7	46.5	332	292.0	293.7	1.1	10.4	5.6	4.3	8	98.8	72
109	5.8	46.7	343	292.0	293.7	0.5	10.6	6.4	4.1	8	98.8	72
110			341	292.0	293.9	0.5	10.5	5.2	6.0	8	98.8	72
111			332	292.0	293.9	0.5	10.4	5.2	6.9	8	98.8	72
112			363	292.0	293.9	0.5	10.9	5.7	6.6	8	98.8	72
113	6.2	48.8	426	292.0	293.9	0.5	11.5	6.3	6.0	8	98.8	72
114	6.4	49.0	471	292.0	293.9	1.1	11.9	6.9	5.4	8	98.8	72
115	6.5	49.4	494	292.0	293.9	1.5	12.2	7.5	4.9	8	98.8	72
116	6.6	49.9	521	292.0	293.9	1.5	12.4	8.0	4.7	8	98.8	72
117	6.7	50.1	549	292.0	294.3	1.5	12.6	6.3	4.8	8	98.8	72
118	7.0	50.6	634	292.0	296.5	1.5	13.2	7.4	5.0	8	98.8	72
119	7.3	51.6	719	292.0	297.5	1.5	13.9	7.2	4.1	8	98.8	72
120	7.3	52.2	708	292.0	297.6	1.2	13.8	7.1	5.3	8	98.8	72
121	7.0	51.3	626	292.0	297.6	0.5	13.1	6.1	5.8	8	98.8	72
122	6.8	50.5	580	292.0	297.7	0.5	12.8	5.9	5.6	8	98.8	72
123	7.0	50.4	616	292.0	297.6	0.5	13.1	6.7	5.3	8	98.8	72
124	7.1	51.1	671	292.0	297.5	0.5	13.5	7.7	5.3	8	98.8	72
125	7.1	51.3	649	292.0	297.6	0.5	13.3	8.0	5.8	8	98.8	72
126			614	292.0	297.6	1.0	13.0	7.6	7.0	8	98.8	71
127	6.8	50.7	579	292.0	297.5	1.5	12.8	7.3	6.5	8	98.8	71
128	6.6	50.2	538	292.0	297.6	1.5	12.5	7.2	5.8	8	98.8	71
129			534	292.0	298.0	1.5	12.5	7.4	6.9	8	98.8	71
130			535	292.0	300.4	1.5	12.5	7.3	7.1	8	98.8	71
131	6.7	50.0	555	292.0	302.5	1.5	12.6	6.6	5.6	8	98.8	71
132	6.6	49.8	517	292.0	302.7	1.3	12.3	5.6	6.1	8	98.8	71
133	6.4	49.5	490	292.0	302.7	0.5	12.1	5.0	5.7	8	98.8	71
134	6.7	50.4	557	292.0	301.5	0.5	12.6	5.6	4.6	8	98.8	71
135	7.0	51.5	631	292.0	299.3	0.5	13.2	6.6	5.2	8	98.8	71
136	7.0	51.2	628	292.0	299.0	0.5	13.1	7.1	5.6	8	98.8	71
137	6.8	50.7	585	292.0	298.9	0.5	12.8	6.3	6.3	8	98.8	71
138	6.7	50.1	547	292.0	298.9	0.9	12.6	6.4	6.1	8	98.8	71
139	6.6	50.1	527	292.0	298.9	1.5	12.4	5.7	5.6	8	98.8	71
140	6.4	49.6	490	292.0	298.8	1.5	12.1	6.1	5.1	8	98.8	71
141	6.4	50.0	487	292.0	298.8	1.5	12.1	6.1	4.4	8	98.8	71
142	6.5	50.0	495	292.0	298.8	1.5	12.2	4.8	4.7	8	98.8	71
143	6.5	49.8	510	292.0	297.9	1.5	12.3	6.4	5.6	8	98.8	71
144	6.5	49.7	496	292.0	297.7	1.4	12.2	6.2	5.6	8	98.8	71
145	6.1	49.3	419	292.0	297.9	0.5	11.6	6.4	6.2	8	98.8	71
146	6.1	48.3	401	292.0	299.7	0.5	11.3	6.3	6.2	8	98.8	71
147	6.4	48.8	489	292.0	300.4	0.5	12.1	7.0	5.9	8	98.8	71
148	7.1	50.7	665	292.0	300.4	0.5	13.4	7.2	5.8	8	98.8	71
149	7.2	52.1	701	292.0	300.4	0.5	13.7	6.0	5.4	8	98.8	71
150	7.1	52.1	644	292.0	300.4	0.7	13.3	6.6	4.8	8	98.8	70
151	6.8	50.5	584	292.0	300.4	1.5	12.8	6.1	5.0	8	98.8	70
152	6.6	50.3	530	292.0	300.4	1.5	12.4	6.0	4.7	8	98.8	70
153	6.7	50.0	542	292.0	300.4	1.5	12.6	5.7	4.5	8	98.8	70
154	6.6	50.2	523	292.0	300.4	1.5	12.3	5.5	4.0	8	98.8	70
155	6.3	49.5	448	292.0	299.7	1.5	11.7	5.9	4.4	8	98.8	70
156	6.1	49.2	413	292.0	299.0	1.5	11.4	5.3	4.1	8	98.8	72
157	6.1	48.6	398	292.0	298.9	0.5	11.2	5.0	4.9	8	98.8	73
158	6.0	48.6	384	292.0	298.8	0.5	11.1	4.7	4.3	8	98.8	73
159	5.9	47.7	366	292.0	298.8	0.5	10.9	5.7	3.3	8	98.8	73
160	5.8	47.5	356	292.0	298.8	0.5	10.8	4.9	3.4	8	98.8	73
161	5.8	47.1	352	292.0	298.8	0.5	10.8	6.0	2.5	8	98.8	73
162	5.8	47.2	356	292.0	298.8	0.6	10.8	6.1	3.9	8	98.8	74
163	5.8	47.3	342	292.0	298.8	1.5	10.6	6.0	5.1	8	98.8	74
164			299	292.0	298.8	1.5	9.8	4.9	6.4	8	98.8	74
165	5.2	45.8	254	292.0	299.0	1.5	9.2	4.7	5.7	8	98.8	74
166	5.2	45.3	239	292.0	301.0	1.5	8.9	4.9	5.0	8	98.8	74
167	5.1	45.2	231	292.0	303.2	1.5	8.8	4.7	4.8	8	98.8	74
168	5.2	45.3	244	292.0	303.6	1.5	9.0	5.3	4.4	8	98.8	73
169	5.3	45.3	257	292.0	303.6	0.6	9.2	5.7	5.1	8	98.8	72
170	5.3	45.7	265	292.0	303.6	0.5	9.3	5.3	5.8	8	98.8	72
171	5.4	46.5	282	292.0	303.6	0.5	9.6	4.3	4.8	8	98.8	72
172	5.5	47.2	303	292.0	303.6	0.5	9.9	4.5	5.8	8	98.8	72
173	5.7	47.2	338	292.0	303.5	0.5	10.5	5.8	6.0	8	98.8	72
174	6.2	48.4	429	292.0	303.5	0.5	11.5	6.4	4.8	8	98.8	71
175	6.5	49.1	511	292.0	303.5	1.4	12.3	6.1	5.5	8	98.8	71
176	6.7	50.0	548	292.0	303.5	1.5	12.6	6.3	5.0	8	98.8	71

Table E.01 Measurement data - Turbine ON

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
177	7.3	51.0	706	292.0	303.5	1.5	13.8	8.8	5.3	8	98.8	71
178	7.7	53.2	839	292.0	303.5	1.5	14.8	7.5	5.5	8	98.8	71
179	7.7	53.6	837	292.0	303.5	1.5	14.8	7.8	4.4	8	98.8	71
180	7.7	53.2	834	292.0	303.6	1.5	14.8	7.8	4.5	8	98.8	73
181	7.5	53.2	792	292.0	303.6	0.8	14.4	8.0	4.6	8	98.8	73
182	7.4	52.3	740	292.0	304.3	0.5	14.0	7.9	4.7	8	98.8	73
183	7.4	52.1	752	292.0	306.8	0.5	14.2	8.6	4.7	8	98.8	73
184			846	292.0	309.0	0.5	14.9	7.3	5.4	8	98.8	73
185			1001	292.0	309.3	0.5	15.5	6.3	5.8	8	98.8	73
186			1147	292.0	308.7	0.5	15.5	8.5	5.6	8	98.8	71
187			1020	292.0	308.6	1.4	15.4	7.7	5.6	8	98.8	71
188			905	292.0	308.6	1.5	15.3	6.8	5.3	8	98.8	71
189			869	292.0	308.6	1.5	15.0	7.3	5.3	8	98.8	71
190			923	292.0	308.6	1.5	15.3	7.2	5.6	8	98.8	71
191			1006	292.0	308.6	1.5	15.5	6.8	4.9	8	98.8	71
192			1066	292.0	308.6	1.5	15.5	8.0	4.3	8	98.8	73
193			1130	292.0	308.5	0.9	15.4	7.6	4.8	8	98.8	73
194			910	292.0	308.4	0.5	15.3	8.6	5.1	8	98.8	73
195			926	292.0	308.4	0.5	15.4	8.8	6.3	8	98.8	73
196			906	292.0	308.4	0.5	15.3	5.9	6.4	8	98.8	73
197			869	292.0	308.4	0.5	15.0	7.3	5.3	8	98.8	73
198			875	292.0	308.4	0.5	15.0	7.3	5.8	8	98.8	72
199			854	292.0	308.4	1.3	14.9	6.7	7.0	8	98.8	71
200			793	292.0	308.4	1.5	14.4	5.4	6.7	8	98.8	71
201			722	292.0	308.4	1.5	13.9	6.3	6.4	8	98.8	71
202			652	292.0	307.9	1.5	13.3	5.7	7.1	8	98.8	71
203			637	292.0	307.9	1.5	13.2	6.2	6.3	8	98.8	71
204			662	292.0	307.5	1.5	13.4	6.0	6.0	8	98.8	70
205	7.1	51.7	656	292.0	305.9	1.0	13.3	7.9	5.7	8	98.8	70
206	7.2	51.6	704	292.0	305.7	0.5	13.7	7.7	5.5	8	98.8	70
207	7.6	52.8	816	292.0	305.7	0.5	14.7	7.5	6.2	8	98.8	70
208	7.9	53.4	915	292.0	305.7	0.5	15.3	7.4	5.7	8	98.8	70
209	7.9	54.1	921	292.0	305.6	0.5	15.4	6.9	4.9	8	98.8	70
210	7.7	53.3	833	292.0	305.6	0.5	14.7	6.9	5.9	8	98.8	72
211	7.2	52.2	699	292.0	305.5	1.2	13.7	6.5	6.3	8	98.8	72
212	7.0	51.6	630	292.0	305.5	1.5	13.2	6.5	5.6	8	98.8	72
213	6.8	51.6	586	292.0	305.5	1.5	12.8	6.9	5.7	8	98.8	72
214	6.9	51.1	608	292.0	305.5	1.5	13.0	6.2	6.5	8	98.8	72
215	7.1	51.8	641	292.0	305.5	1.5	13.3	6.1	5.9	8	98.8	72
216	7.0	52.7	628	292.0	305.5	1.5	13.1	7.2	5.6	8	98.8	71
217	7.1	51.7	665	292.0	305.5	1.1	13.4	7.4	6.9	8	98.8	71
218	7.1	51.1	649	292.0	305.5	0.5	13.3	7.4	6.5	8	98.8	71
219	6.7	50.8	557	292.0	305.5	0.5	12.6	6.8	5.7	8	98.8	71
220	6.4	50.0	471	292.0	305.5	0.5	12.0	5.1	5.6	8	98.8	71
221	6.2	48.7	424	292.0	305.5	0.5	11.5	5.3	5.9	8	98.8	71
222	6.3	48.4	455	292.0	305.5	0.5	11.8	6.2	5.9	8	98.8	71
223	6.5	49.2	506	292.0	305.5	1.1	12.3	6.6	6.9	8	98.8	71
224	6.5	49.5	507	292.0	305.5	1.5	12.3	6.1	6.1	8	98.8	71
225	6.5	49.7	496	292.0	305.5	1.5	12.2	6.0	6.4	8	98.8	71
226	6.6	49.5	528	292.0	305.5	1.5	12.4	5.0	4.7	8	98.8	71
227	6.6	50.1	541	292.0	304.8	1.5	12.5	5.2	4.4	8	98.8	71
228	6.6	50.2	519	292.0	304.6	1.5	12.3	5.2	4.7	8	98.8	72
229	6.2	49.5	435	292.0	303.6	1.2	11.6	5.9	5.8	8	98.8	73
230			361	292.0	303.5	0.5	10.8	4.7	7.0	8	98.8	73
231	5.9	47.6	366	292.0	303.5	0.5	11.0	5.9	6.5	8	98.8	73
232	6.3	48.6	457	292.0	303.5	0.5	11.8	5.9	6.1	8	98.8	73
233	6.3	49.1	448	292.0	303.5	0.5	11.7	5.9	5.9	8	98.8	73
234	6.3	48.8	456	292.0	303.5	0.5	11.8	5.5	5.9	8	98.8	71
235	6.9	49.8	597	292.0	303.5	1.0	12.9	5.9	5.9	9	98.8	70
236	7.2	51.5	691	292.0	303.5	1.5	13.6	6.4	6.3	9	98.8	70
237	7.0	51.6	633	292.0	303.5	1.5	13.1	6.6	5.3	9	98.8	70
238	6.4	50.4	489	292.0	303.4	1.5	12.1	5.7	5.5	9	98.8	70
239	6.3	49.7	466	292.0	303.5	1.5	12.0	6.3	4.8	9	98.8	70
240	6.6	50.1	525	292.0	303.7	1.5	12.4	6.1	6.0	9	98.8	70
241	6.7	50.5	546	292.0	303.7	1.3	12.5	6.1	6.1	9	98.8	71
242	6.8	50.4	581	292.0	303.7	0.5	12.8	6.1	6.3	9	98.8	71
243	7.0	50.8	637	292.0	303.7	0.5	13.2	6.3	5.2	9	98.8	71
244	6.9	50.3	608	292.0	303.6	0.5	13.0	6.6	5.4	9	98.8	71
245	6.7	50.2	542	292.0	303.6	0.5	12.5	6.7	5.5	9	98.8	71
246	6.7	51.0	547	292.0	303.6	0.5	12.5	7.2	5.3	9	98.8	71
247	6.8	50.7	572	292.0	304.7	0.9	12.8	6.5	5.4	9	98.8	71
248			648	292.0	307.3	1.5	13.3	8.4	5.7	9	98.8	71
249			688	292.0	310.0	1.5	13.7	8.7	5.8	9	98.8	71
250			616	292.0	313.6	1.5	13.1	7.5	5.3	9	98.8	71
251			541	292.0	314.2	1.5	12.5	6.7	4.6	9	98.8	71
252			479	292.0	314.2	1.5	12.0	5.6	4.6	9	98.8	72
253			425	292.0	314.2	1.4	11.5	5.1	4.6	9	98.8	72
254			366	292.0	314.2	0.5	11.1	4.3	4.7	9	98.8	72
255			354	292.0	314.2	0.5	10.8	5.8	4.9	9	98.8	72
256			320	292.0	314.2	0.5	10.2	4.2	5.5	9	98.8	72
257			287	292.0	314.2	0.5	9.7	4.2	5.9	9	98.8	72
258			274	292.0	314.2	0.5	9.5	3.9	6.7	9	98.8	71
259			278	292.0	313.7	0.7	9.6	3.6	6.1	9	98.8	71
260			309	292.0	312.0	1.5	10.1	4.7	5.9	9	98.8	71
261			342	292.0	311.9	1.5	10.6	5.1	7.2	9	98.8	71
262			336	292.0	311.5	1.5	10.6	4.3	6.4	9	98.8	71
263			343	292.0	310.1	1.5	10.6	5.5	6.5	9	98.8	71
264			344	292.0	309.9	1.5	10.6	5.3	6.3	9	98.8	69

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
265			407	292.0	309.9	1.5	11.4	4.3	6.6	9	98.8	69
266			452	292.0	309.9	0.5	11.7	6.7	6.1	9	98.8	69
267			479	292.0	309.9	0.5	12.0	6.3	6.0	9	98.8	69
268			477	292.0	309.9	0.5	12.0	5.1	5.2	9	98.8	69
269	6.9	51.0	594	292.0	304.4	0.7	13.0	6.6	4.3	8	98.8	73
270	6.8	51.2	580	292.0	304.4	0.5	12.9	6.0	4.1	8	98.8	73
271	6.8	50.6	576	292.0	304.4	0.5	12.8	6.3	4.2	8	98.8	73
272	6.8	50.3	568	292.0	304.3	0.5	12.8	5.3	4.4	8	98.8	73
273	6.7	50.7	553	292.0	302.2	0.5	12.7	4.3	3.9	8	98.8	73
274	6.8	50.6	568	292.0	300.1	0.5	12.8	5.0	3.4	8	98.8	74
275	7.0	51.3	622	292.0	299.6	1.4	13.2	5.4	3.5	8	98.8	74
276	7.0	52.3	632	292.0	297.5	1.5	13.3	5.6	4.3	8	98.8	74
277	6.9	51.8	609	292.0	295.2	1.5	13.1	7.3	4.5	8	98.8	74
278	6.8	51.2	567	292.0	294.9	1.5	12.8	6.8	4.3	8	98.8	74
279	6.6	50.8	539	292.0	294.9	1.5	12.5	6.4	4.6	8	98.8	74
280	6.6	51.1	536	292.0	294.9	1.5	12.5	7.1	4.3	8	98.8	72
281	6.7	50.9	544	292.0	294.9	0.9	12.6	6.0	4.6	8	98.8	72
282	6.8	50.4	571	292.0	294.9	0.5	12.8	6.4	4.2	8	98.8	72
283	7.0	50.9	629	292.0	294.9	0.5	13.2	5.2	4.0	8	98.8	72
284	7.2	52.0	688	292.0	294.9	0.5	13.7	6.5	3.6	8	98.8	72
285	7.2	52.4	689	292.0	294.5	0.5	13.8	8.0	3.6	8	98.8	72
286	7.1	51.9	670	292.0	294.4	0.5	13.5	7.1	4.2	8	98.8	74
287	6.9	51.5	610	292.0	294.4	1.3	13.1	6.9	4.2	8	98.8	74
288	6.5	50.6	507	292.0	295.5	1.5	12.3	6.0	4.3	8	98.8	74
289	6.2	49.6	422	292.0	297.4	1.5	11.5	5.1	4.1	8	98.8	74
290	5.8	48.6	354	292.0	297.5	1.5	10.8	4.3	3.8	8	98.8	74
291	5.6	47.8	316	292.0	297.5	1.5	10.2	5.1	3.8	8	98.8	74
292	5.5	47.7	292	292.0	297.6	1.5	9.8	4.4	3.4	8	98.8	75
293	5.3	47.5	269	292.0	297.6	1.0	9.6	5.1	3.2	8	98.8	75
294	5.2	47.2	242	292.0	297.6	0.5	9.0	4.9	3.4	8	98.8	75
295	5.1	47.3	233	292.0	297.6	0.5	8.7	5.0	3.7	8	98.8	75
296	5.2	47.5	250	292.0	297.6	0.5	9.1	4.8	4.3	8	98.8	75
297	5.4	48.2	279	292.0	297.6	0.5	9.6	4.6	5.7	8	98.8	75
298			322	292.0	297.6	0.5	10.3	5.3	6.6	8	98.8	73
299	6.0	48.8	393	292.0	297.6	1.2	11.2	5.0	6.3	8	98.8	73
300	6.8	50.2	585	292.0	297.4	1.5	12.9	7.4	5.1	8	98.8	73
301	7.2	51.9	701	292.0	297.4	1.5	13.8	8.3	5.3	8	98.8	73
302	7.3	52.3	717	292.0	297.4	1.5	13.9	6.9	5.2	8	98.8	73
303	7.2	52.0	696	292.0	298.8	1.5	13.8	7.0	4.9	8	98.8	73
304	7.1	51.9	669	292.0	301.3	1.5	13.5	6.8	5.0	8	98.8	73
305	7.0	51.5	632	292.0	302.1	1.1	13.2	4.6	4.5	8	98.8	73
306	6.7	50.9	555	292.0	302.2	0.5	12.7	4.7	4.1	8	98.8	73
307	6.5	50.2	515	292.0	302.1	0.5	12.4	5.1	3.9	8	98.8	73
308	6.6	49.7	520	292.0	302.1	0.5	12.4	5.1	3.5	8	98.8	73
309	6.5	50.0	505	292.0	300.7	0.5	12.4	5.0	4.1	8	98.8	73
310	6.3	50.0	464	292.0	298.2	0.5	12.0	4.9	3.9	8	98.8	73
311			414	292.0	279.1	2.4	11.0	4.7	3.8	8	98.8	74
312			419	292.0	274.7	1.4	10.9	5.5	3.8	8	98.8	74
313			454	292.0	296.3	1.5	11.8	5.5	3.4	8	98.8	74
314			454	292.0	296.3	1.5	11.8	5.5	4.2	8	98.8	74
315			444	292.0	293.9	1.5	11.7	6.8	5.5	8	98.8	74
316	6.6	49.8	521	292.0	293.6	1.5	12.4	6.6	4.8	8	98.8	72
317	7.0	50.9	615	292.0	293.6	1.2	13.2	6.6	5.2	8	98.8	72
318	7.1	51.6	660	292.0	293.7	0.5	13.4	7.7	5.5	8	98.8	72
319	7.1	51.7	665	292.0	293.7	0.5	13.5	7.9	4.9	8	98.8	72
320	7.2	51.7	698	292.0	294.3	0.5	13.8	7.9	4.4	8	98.8	72
321	7.3	52.1	719	292.0	296.3	0.5	14.0	7.4	5.1	8	98.8	72
322	7.2	51.8	687	292.0	296.6	0.5	13.7	7.6	5.0	8	98.8	72
323	7.1	51.2	655	292.0	296.6	1.0	13.4	6.7	5.2	8	98.8	72
324	7.1	51.2	650	292.0	296.6	1.5	13.4	7.1	4.9	8	98.8	72
325	7.1	51.5	641	292.0	296.6	1.5	13.3	7.0	4.8	8	98.8	72
326	6.8	51.3	580	292.0	297.8	1.5	12.8	5.6	4.7	8	98.8	72
327	6.6	50.4	531	292.0	298.3	1.5	12.5	4.9	4.6	8	98.8	72
328	6.4	50.1	492	292.0	298.3	1.5	12.2	5.6	4.0	8	98.8	74
329	6.3	49.5	447	292.0	298.3	1.2	11.8	6.2	4.5	8	98.8	74
330	6.0	49.2	395	292.0	298.3	0.5	11.3	6.4	4.7	8	98.8	74
331	5.9	48.6	360	292.0	298.3	0.5	11.0	6.4	5.0	8	98.8	74
332	5.7	48.2	337	292.0	300.0	0.5	10.7	5.8	5.6	8	98.8	74
333	5.7	48.0	325	292.0	302.6	0.5	10.5	6.0	6.1	8	98.8	74
334	5.6	47.7	321	292.0	304.5	0.5	10.3	4.4	5.8	8	98.8	71
335	5.6	47.3	316	292.0	304.7	0.9	10.3	5.8	5.6	8	98.8	70
336	5.6	47.8	310	292.0	304.7	1.5	10.2	5.8	5.1	8	98.8	70
337	5.6	47.7	311	292.0	304.7	1.5	10.2	5.8	5.4	8	98.8	70
338	5.5	46.8	292	292.0	304.7	1.5	9.8	5.3	4.5	8	98.8	70
339	5.2	46.7	254	292.0	304.7	1.5	9.3	4.4	4.3	8	98.8	70
340	5.1	46.3	226	292.0	304.7	1.5	8.8	3.8	4.6	8	98.8	71
341			204	292.0	304.7	1.3	8.2	3.8	5.8	8	98.8	72
342	5.0	46.0	217	292.0	304.7	0.5	8.4	4.5	5.2	8	98.8	72
343	5.2	46.2	255	292.0	304.7	0.5	9.1	4.5	5.2	8	98.8	72
344	5.5	46.9	305	292.0	303.7	0.5	10.1	6.2	5.5	8	98.8	72
345	5.8	47.9	356	292.0	303.3	0.5	10.9	6.1	4.1	8	98.8	72
346	5.9	48.6	370	292.0	303.3	0.5	11.1	5.3	3.9	8	98.8	73
347	5.7	47.9	331	292.0	303.3	0.8	10.6	4.5	4.5	8	98.8	73
348	5.6	47.6	309	292.0	303.3	1.5	10.2	5.3	3.7	8	98.8	73
349	5.4	47.2	285	292.0	303.3	1.5	9.7	4.8	3.2	8	98.8	73
350	5.3	46.6	259	292.0	303.3	1.5	9.3	4.6	3.8	8	98.8	73
351	5.1	46.4	230	292.0	303.3	1.5	8.8	4.8	4.3	8	98.8	73
352	4.9	46.2	201	292.0	303.3	1.5	8.2	3.9	4.6	8	98.8	73

Table E.01 Measurement data - Turbine ON

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
353	4.6	46.1	167	292.0	303.1	1.4	7.9	3.4	4.8	8	98.8	73
354	4.2	46.0	119	292.0	301.8	0.5	7.5	4.0	4.4	8	98.8	73
355			73	292.0	301.6	0.5	7.3	3.6	4.7	8	98.8	73
356			110	292.0	302.5	0.5	7.4	4.1	5.2	8	98.8	73
357			151	292.0	302.8	0.5	7.7	4.4	5.1	8	98.8	73
358	4.7	46.8	181	292.0	302.8	0.5	8.0	5.2	5.0	8	98.8	72
359	5.0	46.1	208	292.0	302.8	0.7	8.3	4.8	4.6	8	98.8	71
360	5.2	46.5	245	292.0	302.8	1.5	8.9	5.0	4.3	8	98.8	71
361	5.4	46.9	274	292.0	302.8	1.5	9.5	5.2	2.9	8	98.8	71
362	5.5	47.7	301	292.0	302.0	1.5	10.1	4.6	3.7	8	98.8	71
363	5.5	48.2	306	292.0	300.0	1.5	10.2	5.4	4.2	8	98.8	71
364	5.6	48.5	317	292.0	299.8	1.5	10.2	4.9	4.6	8	98.8	73
365	5.6	48.2	320	292.0	299.8	1.5	10.3	3.5	5.1	8	98.8	74
366	5.5	49.1	302	292.0	298.4	0.5	10.0	3.9	5.9	8	98.8	74
367			270	292.0	295.9	0.5	9.5	4.0	6.0	8	98.8	74
368	5.2	48.3	238	292.0	293.4	0.5	9.0	4.0	5.7	8	98.8	74
369	5.0	47.5	207	292.0	289.7	0.5	8.5	3.7	5.0	8	98.8	74
370	4.8	46.9	192	292.0	285.1	0.5	8.3	3.8	5.6	8	98.8	72
371			166	292.0	280.9	0.5	7.9	3.9	5.3	8	98.8	72
372			149	292.0	280.2	1.5	7.7	4.1	6.0	8	98.8	72
373			132	292.0	280.7	1.5	7.6	4.7	5.0	8	98.8	72
374	4.6	46.2	161	292.0	282.9	1.5	7.9	4.4	4.4	8	98.8	72
375	5.0	46.9	209	292.0	285.4	1.5	8.4	5.2	4.2	8	98.8	72
376	5.0	46.6	212	292.0	289.5	1.5	8.5	5.0	4.3	8	98.8	72
377	4.9	46.4	202	292.0	292.4	1.5	8.2	3.8	4.1	8	98.8	72
378			154	292.0	292.5	0.7	7.8	3.6	6.0	8	98.8	72
379			139	292.0	292.4	0.5	7.6	4.1	6.9	8	98.8	72
380			141	292.0	292.4	0.5	7.6	4.3	6.6	8	98.8	72
381			154	292.0	292.4	0.5	7.7	4.2	6.0	8	98.8	72
382			143	292.0	292.4	0.5	7.7	3.7	5.4	8	98.8	72
383			127	292.0	292.4	0.5	7.5	2.6	4.9	8	98.8	72
384	4.4	46.0	147	292.0	291.9	1.4	7.7	2.7	4.7	8	98.8	72
385	4.7	46.4	172	292.0	289.6	1.5	8.0	3.5	4.8	8	98.8	72
386	4.8	46.5	184	292.0	287.1	1.5	8.1	3.7	5.0	8	98.8	72
387	5.1	46.9	223	292.0	286.5	1.5	8.5	4.2	4.1	8	98.8	72
388	5.3	47.0	266	292.0	286.4	1.5	9.3	4.8	5.3	8	98.8	72
389	5.6	47.7	309	292.0	284.8	1.5	10.2	3.7	5.8	8	98.8	72
390	5.9	48.1	360	292.0	282.4	0.8	11.0	4.8	5.6	8	98.8	72
391	6.0	48.8	377	292.0	279.7	0.5	11.2	5.7	5.3	8	98.8	72
392			365	292.0	276.6	0.5	11.1	5.4	5.3	8	98.8	72
393			343	292.0	276.2	0.5	10.7	4.0	5.8	8	98.8	72
394	7.6	53.3	807	264.0	255.3	0.5	14.6	5.9	5.1	12	98.8	56
395	7.4	52.8	753	264.0	255.0	0.5	14.2	7.1	4.6	12	98.8	56
396	7.4	52.4	748	264.0	255.0	0.5	14.2	7.5	4.5	12	98.8	56
397	7.4	52.5	759	264.0	255.0	0.5	14.3	8.7	5.0	12	98.8	56
398	7.5	52.8	786	264.0	255.0	0.5	14.4	8.1	4.5	12	98.8	56
399	7.7	53.4	855	264.0	255.0	1.1	15.0	8.9	3.3	12	98.8	56
400	8.4	54.4	1117	264.0	255.0	1.5	15.6	8.9	3.4	12	98.8	56
401	8.4	55.1	1109	264.0	255.0	1.5	15.4	8.8	4.9	12	98.8	57
402	7.9	54.1	911	264.0	255.0	1.5	15.2	6.6	6.5	12	98.8	57
403	7.6	53.5	825	264.0	255.0	1.5	14.7	6.2	6.4	12	98.8	57
404	7.4	53.5	753	264.0	255.0	1.5	14.2	7.8	5.5	12	98.8	57
405	7.3	52.7	730	264.0	255.0	1.2	14.0	6.9	5.2	12	98.8	57
406	7.5	52.4	780	264.0	255.0	0.5	14.4	7.3	5.0	12	98.8	57
407	8.8	54.0	1250	264.0	255.0	0.3	15.7	7.8	5.0	12	98.8	57
408	9.7	55.4	1643	264.0	254.5	0.5	15.6	9.2	5.2	12	98.8	57
409	9.3	54.8	1479	264.0	252.9	0.5	15.3	10.0	5.0	12	98.8	57
410	9.2	54.4	1452	264.0	252.7	0.5	15.4	10.1	5.3	12	98.8	57
411	9.5	55.2	1573	264.0	252.7	1.0	15.5	9.3	7.2	12	98.8	57
412	9.7	55.9	1672	264.0	252.7	1.5	15.5	9.9	6.6	12	98.8	57
413	9.6	55.4	1626	264.0	252.8	1.5	15.4	10.3	6.6	12	98.8	55
414	9.3	55.0	1481	264.0	252.7	1.5	15.4	10.1	6.4	12	98.8	55
415	9.2	55.1	1421	264.0	252.7	1.5	15.4	9.6	7.1	12	98.8	55
416	9.2	55.4	1417	264.0	252.7	1.5	15.4	10.1	7.4	12	98.8	55
417	9.0	55.6	1333	264.0	252.7	1.3	15.4	10.0	6.9	12	98.8	55
418	8.3	54.6	1046	264.0	252.7	0.5	15.2	8.9	5.8	12	98.8	55
419	8.5	54.5	1146	264.0	252.7	0.5	15.5	7.9	6.1	12	98.8	56
420	9.0	55.3	1360	264.0	252.7	0.5	15.5	9.3	7.0	12	98.8	56
421	8.2	54.3	1015	264.0	252.7	0.5	15.2	8.5	7.4	12	98.8	56
422	8.4	54.5	1098	264.0	252.7	0.5	15.5	9.0	7.5	12	98.8	56
423	8.9	55.1	1300	264.0	252.7	0.8	15.5	9.6	7.4	12	98.8	56
424	8.9	55.2	1317	264.0	252.7	1.5	15.4	8.8	6.2	12	98.8	56
425	8.8	55.0	1260	264.0	252.7	1.5	15.4	7.9	6.0	12	98.8	57
426	8.7	54.9	1227	264.0	252.7	1.5	15.4	8.0	5.8	12	98.8	57
427	8.5	55.1	1151	264.0	252.7	1.5	15.4	8.2	6.1	12	98.8	57
428	8.5	55.2	1128	264.0	252.6	1.5	15.4	8.7	5.3	12	98.8	57
429	9.2	55.0	1421	264.0	252.5	1.4	15.7	8.5	5.0	12	98.8	57
430	8.7	55.1	1211	264.0	252.5	0.5	15.2	9.8	5.9	12	98.8	57
431	8.9	54.7	1285	264.0	252.5	0.5	15.6	10.2	6.3	12	98.8	57
432	8.8	55.0	1279	264.0	252.5	0.5	15.4	9.0	6.2	12	98.8	57
433	8.3	54.4	1049	264.0	252.5	0.5	15.3	7.7	6.7	12	98.8	57
434	8.3	55.1	1052	264.0	252.5	0.5	15.4	7.8	6.8	12	98.8	57
435	8.0	54.6	939	264.0	252.5	0.7	15.3	7.9	5.8	12	98.8	57
436	7.8	54.2	871	264.0	252.5	1.5	15.1	8.4	5.6	12	98.8	57
437	8.2	54.6	1034	264.0	252.5	1.5	15.5	9.0	7.0	12	98.8	58
438	9.0	54.9	1349	264.0	252.5	1.5	15.6	9.3	6.4	12	98.8	58
439	8.6	55.3	1191	264.0	252.6	1.5	15.3	8.2	5.6	12	98.8	58
440	8.2	54.5	1007	264.0	253.7	1.5	15.4	8.9	5.8	12	98.8	58

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
441	9.2	55.2	1424	264.0	256.3	1.4	15.7	9.9	6.4	12	98.8	58
442	9.5	55.3	1560	264.0	257.6	0.5	15.4	9.9	5.5	12	98.8	58
443	9.5	54.9	1592	264.0	257.7	0.5	15.5	10.6	6.4	12	98.8	58
444	10.0	56.0	1812	264.0	257.8	0.5	15.5	10.9	5.4	12	98.8	58
445	9.5	56.1	1592	264.0	257.8	0.5	15.2	10.7	6.8	12	98.8	58
446	8.7	54.6	1226	264.0	257.8	0.5	15.2	10.1	7.9	12	98.8	58
447	8.4	54.3	1089	264.0	257.8	0.5	15.3	9.0	7.6	12	98.8	58
448	8.1	54.5	1001	264.0	257.8	1.5	15.4	8.3	6.5	12	98.8	58
449	8.3	54.9	1059	264.0	257.8	1.5	15.5	7.5	6.1	12	98.8	58
450	9.0	55.0	1352	264.0	257.8	1.5	15.7	8.2	6.6	12	98.8	58
451	8.9	55.2	1291	264.0	257.8	1.5	15.3	8.6	8.5	12	98.8	58
452	8.0	54.4	954	264.0	257.8	1.5	15.2	7.4	8.5	12	98.8	58
453	7.9	54.2	905	264.0	257.8	1.5	15.3	7.9	8.5	12	98.8	58
454	7.6	53.9	822	264.0	257.8	0.6	14.7	7.0	7.5	12	98.8	58
455	7.3	52.5	728	264.0	257.8	0.5	14.0	6.1	7.0	12	98.8	58
456	7.2	52.2	694	264.0	257.7	0.5	13.7	7.0	6.4	12	98.8	58
457	7.1	52.2	667	264.0	257.7	0.5	13.5	7.7	6.5	12	98.8	58
458	6.9	51.5	600	264.0	257.7	0.5	13.0	7.4	6.8	12	98.8	58
459	6.9	51.7	593	264.0	257.7	0.5	13.0	7.2	6.9	12	98.8	58
460	7.8	52.4	887	264.0	258.5	1.3	14.8	8.0	6.7	12	98.8	58
461	9.0	55.4	1332	264.0	258.7	1.4	15.6	6.9	6.6	12	98.8	58
462	8.3	54.8	1053	264.0	258.7	1.5	15.3	7.4	6.5	12	98.8	58
463	8.6	54.5	1193	264.0	258.7	1.5	15.6	9.2	6.6	12	98.8	58
464	8.6	54.9	1164	264.0	258.7	1.5	15.4	9.0	7.1	12	98.8	58
465	8.7	55.0	1208	264.0	258.7	1.5	15.5	8.7	6.9	12	98.8	58
466	8.9	55.1	1316	264.0	258.7	1.5	15.5	8.2	6.4	12	98.8	58
467	8.5	54.3	1157	264.0	258.7	1.5	15.4	8.1	6.3	12	98.8	59
468	8.2	54.6	1014	264.0	258.7	1.5	15.3	8.3	6.1	12	98.8	59
469	7.8	54.2	871	264.0	258.7	1.5	15.1	7.1	5.6	12	98.8	59
470	7.7	54.0	857	264.0	258.7	1.5	15.0	8.8	5.8	12	98.8	59
471	9.0	54.8	1326	264.0	258.7	1.1	15.8	9.6	6.3	12	98.8	59
472	9.4	55.7	1548	264.0	258.7	1.5	15.5	9.5	7.0	12	98.8	59
473	9.1	55.2	1403	264.0	258.7	1.5	15.3	10.2	6.8	12	98.8	59
474	9.0	54.9	1336	264.0	258.7	1.5	15.4	9.3	7.5	12	98.8	59
475	8.9	55.1	1291	264.0	258.7	1.5	15.4	9.4	7.1	12	98.8	59
476	8.3	54.8	1060	264.0	258.7	1.5	15.3	8.5	6.1	12	98.8	59
477	8.8	54.9	1266	264.0	258.7	1.4	15.6	9.9	5.6	12	98.8	59
478	9.3	55.8	1492	264.0	258.7	0.8	15.5	10.0	6.0	12	98.8	59
479	9.0	54.6	1333	264.0	258.7	0.5	15.4	10.0	6.5	12	98.8	59
480	8.9	54.7	1302	264.0	258.7	0.5	15.4	10.0	5.9	12	98.8	59
481	8.6	54.5	1193	264.0	258.7	0.5	15.4	8.8	5.4	12	98.8	59
482	8.7	55.0	1230	264.0	258.7	0.5	15.5	8.6	5.8	12	98.8	59
483	9.1	55.2	1408	264.0	258.7	0.5	15.6	9.4	6.1	12	98.8	59
484	9.1	54.7	1387	264.0	258.7	1.3	15.4	9.0	6.5	12	98.8	59
485	8.8	55.1	1258	264.0	258.7	1.5	15.3	9.0	5.8	12	98.8	60
486	8.7	54.6	1217	264.0	258.7	1.5	15.5	8.2	6.6	12	98.8	60
487	9.3	55.2	1477	264.0	258.7	1.5	15.6	9.6	6.2	12	98.8	60
488	9.2	55.1	1414	264.0	258.7	1.5	15.3	9.5	7.1	12	98.8	60
489	8.9	54.4	1301	264.0	258.7	1.5	15.5	9.5	6.1	12	98.8	60
490	9.2	55.7	1417	264.0	258.7	0.9	15.4	10.1	6.2	12	98.8	60
491	8.3	54.1	1059	264.0	259.2	0.5	15.2	9.2	6.4	12	98.8	60
492	7.9	53.7	897	264.0	259.4	0.5	15.2	8.2	7.0	12	98.9	60
493	7.6	53.5	803	264.0	259.4	0.5	14.6	6.8	7.3	12	98.9	60
494	7.2	52.4	699	264.0	259.4	0.5	13.7	7.1	6.8	12	98.9	60
495	7.0	51.4	628	264.0	259.4	0.5	13.2	6.5	6.7	12	98.9	60
496	7.1	51.4	658	264.0	259.4	1.3	13.5	8.0	6.6	12	98.9	60
497	7.6	52.7	810	264.0	259.4	1.5	14.6	8.2	5.5	12	98.9	60
498	8.5	54.3	1125	264.0	259.4	1.4	15.6	9.2	5.5	12	98.9	60
499	9.0	55.1	1360	264.0	259.4	1.5	15.5	9.1	6.1	12	98.9	60
500	8.3	54.3	1073	264.0	259.4	1.5	15.2	7.5	5.8	12	98.9	60
501	7.9	54.1	905	264.0	259.4	1.5	15.2	5.8	6.0	12	98.9	60
502	7.7	53.8	846	264.0	259.3	1.0	14.9	5.8	6.0	12	98.9	60
503	7.9	53.4	902	264.0	258.8	0.5	15.1	8.0	6.7	12	98.9	60
504	8.7	54.4	1222	264.0	258.7	0.5	15.6	9.1	6.7	12	98.9	60
505	8.2	54.2	1041	264.0	258.7	0.5	15.3	9.0	6.7	12	98.9	60
506	8.2	54.1	1040	264.0	258.7	0.5	15.5	9.0	6.0	12	98.9	60
507	8.6	55.0	1203	264.0	258.7	0.5	15.5	9.6	6.5	12	98.9	60
508	8.4	54.5	1095	264.0	258.7	1.2	15.4	9.3	6.7	12	98.9	60
509	8.2	54.7	1024	264.0	258.7	1.5	15.4	9.0	7.4	12	98.8	60
510	8.0	54.5	930	264.0	258.7	1.5	15.3	8.0	6.9	12	98.8	60
511	7.7	53.8	856	264.0	258.7	1.5	15.0	7.7	6.6	12	98.8	60
512	7.6	53.2	823	264.0	258.7	1.5	14.8	8.0	5.8	12	98.8	60
513	7.8	53.7	890	264.0	258.7	1.5	15.2	8.2	5.4	12	98.8	60
514	7.9	54.2	915	264.0	258.7	1.1	15.4	6.6	5.3	12	98.8	60
515	7.7	53.8	849	264.0	259.7	0.5	14.9	6.4	5.7	12	98.8	61
516	7.3	52.9	733	264.0	260.5	0.5	14.0	5.2	6.3	12	98.9	61
517	7.0	51.6	627	264.0	260.6	0.5	13.2	6.4	6.3	12	98.9	61
518	6.7	50.8	560	264.0	260.6	0.5	12.7	6.2	5.9	12	98.9	61
519	6.4	50.2	492	264.0	260.6	0.5	12.2	7.0	5.8	12	98.9	61
520	6.4	49.5	486	264.0	260.6	1.1	12.2	6.1	7.0	12	98.9	61
521	6.6	49.9	535	264.0	260.6	1.5	12.5	6.8	7.2	12	98.9	60
522	6.9	50.9	607	264.0	261.1	1.5	13.1	7.0	7.0	12	98.9	60
523	6.9	50.9	613	264.0	262.4	1.5	13.1	5.9	6.7	12	98.9	60
524	6.7	50.9	549	264.0	262.5	1.5	12.6	6.4	5.8	12	98.9	60
525	6.8	50.3	582	264.0	262.5	1.5	12.9	5.9	5.8	12	98.9	60
526	7.1	51.3	666	264.0	262.5	1.2	13.5	7.4	6.0	12	98.9	60
527	7.1	51.5	648	264.0	262.5	0.5	13.3	7.2	5.9	12	98.9	60
528	6.9	50.9	592	264.0	262.5	0.5	12.9	6.6	6.0	12	98.9	60

Table E.01 Measurement data - Turbine ON

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
529	6.8	50.8	577	264.0	262.5	0.5	12.8	5.6	6.1	12	98.9	60
530	6.7	50.6	562	264.0	262.5	0.5	12.7	6.0	5.9	12	98.9	60
531	6.6	50.3	538	264.0	262.5	0.5	12.5	7.0	6.0	12	98.9	60
532	6.5	50.2	511	264.0	262.5	1.0	12.3	6.3	5.5	12	98.9	60
533	6.6	49.9	523	264.0	262.5	1.5	12.4	6.3	4.9	12	98.9	61
534	6.4	49.8	473	264.0	262.5	1.5	12.0	6.5	4.5	12	98.9	61
535	6.3	49.5	455	264.0	262.5	1.5	11.8	6.5	4.4	12	98.9	61
536	6.4	49.7	484	264.0	262.5	1.5	12.1	7.0	4.6	12	98.9	61
537	6.9	50.6	607	264.0	262.5	1.5	13.0	7.2	4.9	12	98.9	61
538	7.1	51.4	669	264.0	262.5	1.3	13.5	6.8	4.8	12	98.9	61
539	6.8	50.9	582	264.0	262.5	0.5	12.8	6.5	5.1	12	98.9	61
540	6.7	50.3	543	264.0	262.5	0.5	12.6	7.1	4.5	12	98.9	61
541	6.8	50.5	576	264.0	262.5	0.5	12.8	6.8	4.8	12	98.9	61
542	6.9	50.7	608	264.0	262.5	0.5	13.0	7.3	5.0	12	98.9	61
543	6.8	50.8	573	264.0	262.5	0.5	12.8	5.8	4.7	12	98.9	61
544	6.7	50.2	550	264.0	262.5	0.8	12.7	5.6	4.3	12	98.9	61
545	6.6	50.1	539	264.0	262.5	1.5	12.5	5.9	4.4	12	98.9	61
546	6.6	49.8	539	264.0	262.5	1.5	12.5	6.9	5.0	12	98.9	61
547	6.8	50.3	584	264.0	262.7	1.5	12.9	6.8	5.9	12	98.9	61
548	7.1	50.9	648	264.0	263.0	1.5	13.4	7.0	5.4	12	98.9	61
549	7.3	51.6	704	264.0	263.1	1.5	13.8	7.5	5.5	12	98.9	61
550	7.3	52.0	723	264.0	263.1	1.4	14.0	6.9	5.2	12	98.9	61
551	7.1	51.8	659	264.0	263.1	0.5	13.5	6.8	5.0	12	98.9	61
552	6.9	51.0	601	264.0	263.1	0.5	13.0	5.7	4.3	12	98.9	61
553	6.6	50.6	519	264.0	263.0	0.5	12.4	5.9	4.4	12	98.9	61
554	6.3	49.7	466	264.0	262.6	0.5	11.9	5.9	4.8	12	98.9	61
555	6.2	49.2	430	264.0	262.5	0.5	11.6	5.8	5.2	12	98.9	61
556	6.1	48.8	404	264.0	262.6	0.7	11.4	6.2	5.1	12	98.9	61
557	6.4	49.2	485	264.0	264.0	1.5	12.1	7.1	5.8	12	98.9	61
558	6.7	50.2	552	264.0	266.0	1.5	12.7	6.3	6.0	12	98.9	62
559	6.6	50.6	537	264.0	266.3	1.5	12.5	5.5	6.5	12	98.9	62
560	6.5	50.2	505	264.0	266.3	1.5	12.3	6.6	6.5	12	98.9	62
561	6.5	50.1	513	264.0	266.3	1.5	12.3	6.6	5.6	12	98.9	62
562	6.7	50.3	562	264.0	266.3	1.5	12.7	7.6	5.2	12	98.9	62
563	6.9	50.8	605	264.0	266.3	0.5	13.0	7.6	4.7	12	98.9	61
564	6.9	50.9	610	264.0	266.3	0.5	13.1	7.6	4.9	12	98.9	61
565	6.9	50.9	611	264.0	266.3	0.5	13.1	7.4	4.8	12	98.9	61
566	6.8	50.9	582	264.0	267.1	0.5	12.9	7.0	5.4	12	98.9	61
567	6.8	50.5	568	264.0	268.5	0.5	12.8	7.3	5.0	12	98.9	61
568	6.9	51.1	611	264.0	268.5	0.6	13.1	7.4	5.0	12	98.9	61
569	7.0	51.1	634	264.0	268.5	1.5	13.3	8.0	5.0	12	98.9	61
570	7.0	51.4	632	264.0	268.5	1.5	13.2	6.9	4.7	12	98.9	61
571			601	264.0	268.5	1.5	13.0	6.4	4.7	12	98.9	61
572	6.9	51.1	609	264.0	268.5	1.5	13.1	7.1	4.5	12	98.9	61
573	7.0	51.2	622	264.0	268.5	1.5	13.1	7.2	4.2	12	98.9	61
574	6.9	51.0	597	264.0	268.5	1.5	13.0	6.5	4.5	12	98.9	61
575	6.6	50.6	537	264.0	268.5	0.6	12.5	6.2	5.4	12	98.9	61
576	6.3	49.4	456	264.0	268.5	0.5	11.8	4.7	4.9	12	98.9	61
577	6.1	49.5	400	264.0	268.5	0.5	11.3	5.8	4.6	12	98.9	61
578	5.8	48.4	356	264.0	269.7	0.5	10.9	5.4	4.9	12	98.9	61
579	5.7	48.1	331	264.0	271.6	0.5	10.5	4.3	5.5	12	98.9	61
580	5.5	47.5	304	264.0	271.8	0.5	10.0	5.4	5.7	12	98.9	61
581	5.5	47.0	298	264.0	271.8	1.4	9.9	6.1	5.4	12	98.9	61
582	5.5	48.0	304	264.0	271.8	1.5	10.1	6.0	5.3	12	98.9	61
583	5.6	47.6	323	264.0	271.8	1.5	10.3	5.5	5.6	12	98.9	61
584	5.7	47.6	339	264.0	271.8	1.5	10.6	5.7	5.3	12	98.9	61
585	5.8	47.9	350	264.0	271.8	1.5	10.8	6.1	5.7	12	98.9	61
586	5.8	47.7	349	264.0	271.8	1.5	10.7	5.2	5.3	12	98.9	61
587	5.7	47.5	329	264.0	271.8	0.7	10.4	3.9	5.0	12	98.9	60
588	5.5	47.5	307	264.0	271.8	0.5	10.0	5.3	4.3	12	98.9	60
589	5.5	47.2	290	264.0	271.8	0.5	9.8	5.7	3.7	12	98.9	60
590	5.3	46.9	268	264.0	271.8	0.5	9.4	4.4	3.9	12	98.9	60
591	5.2	46.4	244	264.0	271.8	0.5	9.1	4.3	3.9	12	98.9	60
592	5.3	46.6	255	264.0	271.8	0.5	9.2	4.6	4.2	12	98.9	60
593	5.4	46.4	275	264.0	271.7	1.4	9.6	4.9	4.1	12	98.9	61
594	5.5	47.4	302	264.0	271.4	1.5	10.0	5.8	4.6	12	98.9	61
595	5.5	47.4	307	264.0	271.3	1.5	10.0	5.8	4.4	12	98.9	61
596	5.6	47.8	310	264.0	271.3	1.5	10.1	4.6	4.0	12	98.9	61
597	5.7	47.8	340	264.0	271.3	1.5	10.6	5.2	4.9	12	98.9	61
598	6.0	48.2	382	264.0	271.3	1.5	11.2	6.3	5.0	12	98.9	61
599	6.0	48.6	378	264.0	271.3	0.9	11.2	5.4	4.6	12	98.9	61
600	5.8	48.2	355	264.0	271.3	0.5	10.8	5.3	4.4	12	98.9	61
601	5.8	48.1	347	264.0	271.3	0.5	10.7	4.6	4.4	12	98.9	61
602	5.6	47.8	316	264.0	271.3	0.5	10.2	4.9	3.9	12	98.9	61
603	5.4	47.4	276	264.0	271.3	0.5	9.5	5.2	3.8	12	98.9	61
604	5.2	47.1	248	264.0	271.4	0.5	9.1	5.2	4.1	12	98.9	61
605			1982	245.0	238.8	0.3	15.8	9.3	8.3	13	98.8	67
606	11.9	57.7	2238	245.0	238.8	1.4	15.7	11.1	8.1	13	98.8	67
607	10.8	57.5	2233	245.0	238.8	2.1	15.6	10.1	7.8	13	98.8	67
608			2221	245.0	238.1	1.7	15.5	8.7	8.7	13	98.8	67
609	11.4	57.2	2172	245.0	236.2	1.0	15.2	10.6	6.9	13	98.8	66
610	9.1	55.6	1387	245.0	235.9	1.5	14.7	7.2	6.1	13	98.8	66
611	9.3	55.4	1479	245.0	234.3	1.5	15.5	8.0	6.1	13	98.8	66
612	10.0	56.0	1781	245.0	233.1	1.4	15.7	10.7	6.6	13	98.8	66
613	10.5	56.7	2172	245.0	233.0	0.9	15.7	9.9	7.1	13	98.8	66
614	12.5	56.6	2230	245.0	232.9	3.3	15.8	11.7	7.4	13	98.8	66
615	13.0	56.2	2227	245.0	232.9	3.7	15.5	12.2	7.6	13	98.8	67
616	12.5	56.9	2178	245.0	232.9	0.9	15.2	11.7	8.2	13	98.8	67

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
617	10.1	56.7	1848	245.0	232.9	1.4	15.1	9.4	7.1	13	98.8	67
618	12.3	57.4	2223	245.0	232.9	2.6	15.8	11.5	6.9	13	98.8	67
619	11.1	56.8	2225	245.0	232.9	1.0	15.5	10.4	7.8	13	98.8	67
620	12.2	57.3	2231	245.0	232.9	5.1	15.9	11.5	7.0	13	98.8	67
621	14.4	56.6	2224	245.0	232.9	6.3	15.5	13.5	5.9	13	98.8	67
622	14.2	57.3	2214	245.0	232.9	7.6	15.5	13.3	6.3	13	98.8	67
623	12.6	58.3	2231	245.0	232.9	6.8	15.5	11.8	6.3	13	98.8	67
624	14.3	56.9	2211	245.0	232.9	5.9	15.3	13.4	6.3	13	98.8	67
625	11.2	57.7	2225	245.0	232.9	2.7	15.5	10.5	6.1	13	98.8	67
626	12.6	57.0	2225	245.0	232.9	4.7	15.6	11.8	5.9	13	98.8	67
627	11.8	57.0	2207	245.0	232.9	2.2	15.3	11.1	7.7	13	98.8	68
628	10.2	58.5	1875	245.0	232.9	1.3	14.8	10.9	9.8	13	98.8	68
629	10.2	57.1	1894	245.0	232.9	1.4	15.4	8.7	8.0	13	98.8	68
630	11.5	56.6	2014	245.0	232.8	1.2	15.4	10.8	9.0	13	98.8	68
631	11.8	57.1	2079	245.0	232.8	1.0	15.4	11.1	9.6	13	98.8	68
632	12.7	57.0	2134	245.0	232.8	1.0	15.4	11.8	8.9	13	98.8	68
633	12.5	58.0	2170	245.0	232.8	1.0	15.6	11.7	9.5	13	98.8	67
634	11.4	57.9	2230	245.0	232.8	5.9	16.0	10.7	8.4	13	98.8	67
635	11.0	57.4	2226	245.0	232.6	3.9	15.5	10.3	7.2	13	98.8	67
636	11.6	57.0	2231	245.0	230.7	1.0	15.6	10.9	7.1	13	98.8	67
637			2225	245.0	229.4	1.9	15.6	10.7	9.1	13	98.8	67
638			2224	245.0	229.4	2.4	15.5	11.3	9.2	13	98.8	67
639			2233	245.0	229.4	2.7	15.5	11.3	8.1	13	98.8	67
640			2216	245.0	229.4	4.0	15.5	12.3	8.5	13	98.8	67
641			2231	245.0	229.4	5.8	15.6	13.5	8.6	13	98.8	67
642			2230	245.0	229.4	6.5	15.5	13.0	6.8	13	98.8	67
643			2210	245.0	229.4	3.6	15.3	11.4	7.3	13	98.8	67
644			2215	245.0	229.5	1.7	15.4	10.5	7.8	13	98.8	67
645			2204	245.0	229.8	0.9	15.2	11.9	6.9	13	98.8	68
646			2231	245.0	229.9	4.9	15.8	13.3	7.3	13	98.8	68
647	12.3	56.5	2209	245.0	230.1	3.1	15.4	11.5	7.7	13	98.8	68
648	12.4	57.4	2226	245.0	230.1	1.7	15.5	11.6	8.9	13	98.8	68
649	11.1	57.1	2118	245.0	231.1	1.1	15.0	10.4	10.0	13	98.8	68
650	10.7	56.8	1905	245.0	231.3	1.3	15.2	10.0	10.5	13	98.8	68
651	12.3	57.0	2225	245.0	231.3	3.8	16.0	11.5	9.7	13	98.8	67
652	12.7	56.9	2231	245.0	231.3	3.6	15.5	11.9	8.9	13	98.8	67
653			2202	245.0	231.3	0.9	15.3	9.6	9.9	13	98.8	67
654	11.7	56.9	2179	245.0	231.3	1.9	15.5	10.9	8.4	13	98.8	67
655	11.9	56.9	2225	245.0	231.3	5.2	15.7	11.1	8.9	13	98.8	67
656	11.9	57.9	2232	245.0	231.2	5.3	15.6	11.1	8.5	13	98.8	67
657	12.6	57.0	2228	245.0	231.2	5.1	15.5	11.8	8.3	13	98.8	67
658	13.3	56.6	2233	245.0	231.2	5.5	15.5	12.4	8.6	13	98.8	67
659	13.3	57.3	2222	245.0	231.2	6.2	15.5	12.5	8.4	13	98.8	67
660	12.7	57.0	2223	245.0	231.2	4.8	15.4	11.9	8.4	13	98.8	67
661	14.4	57.4	2233	245.0	231.2	5.5	15.6	13.5	6.9	13	98.8	67
662	14.7	58.4	2231	245.0	231.2	6.7	15.5	13.8	8.1	13	98.8	67
663	14.1	57.2	2223	245.0	231.2	7.5	15.5	13.2	8.5	13	98.8	68
664	13.9	57.4	2230	245.0	231.2	8.4	15.5	13.0	8.5	13	98.8	68
665	14.9	57.8	2223	245.0	230.4	8.3	15.5	14.0	8.4	13	98.8	68
666			2220	245.0	228.4	7.5	15.4	13.1	9.7	13	98.8	68
667			2208	245.0	228.1	5.7	15.4	12.9	8.2	13	98.8	68
668			2217	245.0	228.1	2.6	15.4	12.2	7.2	13	98.8	68
669			2240	245.0	228.0	3.2	15.7	10.9	8.5	13	98.8	68
670			2219	245.0	228.0	5.2	15.5	12.9	9.1	13	98.8	68
671			2227	245.0	228.0	4.3	15.5	12.6	8.9	13	98.8	68
672			2219	245.0	228.0	3.3	15.4	11.2	8.2	13	98.8	68
673			2226	245.0	228.0	2.2	15.5	12.5	8.2	13	98.8	68
674			2232	245.0	227.9	4.6	15.7	11.2	7.3	13	98.8	68
675			2230	245.0	227.9	8.6	15.6	13.5	7.5	13	98.8	68
676			2213	245.0	227.9	7.2	15.3	12.7	7.6	13	98.8	68
677			2220	245.0	227.9	7.9	15.6	13.5	6.6	13	98.8	68
678			2224	245.0	227.9	9.7	15.6	14.5	8.4	13	98.8	68
679			2196	245.0	227.9	7.1	15.2	11.8	10.2	13	98.8	68
680			2224	245.0	227.9	3.4	15.5	11.5	9.0	13	98.8	68
681			2235	245.0	227.9	3.3	15.6	11.5	8.1	13	98.8	67
682			2225	245.0	227.9	1.7	15.4	10.6	9.4	13	98.8	67
683			2232	245.0	227.9	2.4	15.6	12.9	11.1	13	98.8	67
684			2230	245.0	227.9	6.9	15.7	12.2	10.4	13	98.8	67
685	11.1	57.0	2229	245.0	233.3	3.5	15.5	10.4	10.2	13	98.8	66
686	13.6	56.6	2235	245.0	233.2	5.2	15.8	12.7	10.0	13	98.8	66
687	14.8	56.2	2207	245.0	233.2	6.9	15.4	13.8	8.3	13	98.8	66
688	12.8	56.9	2222	245.0	233.2	3.3	15.4	12.0	8.6	13	98.8	66
689	11.8	58.1	2232	245.0	233.2	1.8	15.5	11.1	8.3	13	98.8	67
690	12.9	58.6	2224	245.0	233.2	2.8	15.5	12.1	8.1	13	98.8	67
691	12.4	57.3	2224	245.0	233.2	3.7	15.6	11.6	8.0	13	98.8	67
692	13.9	57.0	2239	245.0	233.2	7.0	15.7	13.0	8.8	13	98.8	67
693	13.7	57.4	2226	245.0	233.2	9.3	15.5	12.8	7.8	13	98.8	67
694	13.2	58.9	2200	245.0	233.2	6.8	15.3	12.4	8.0	13	98.8	67
695	12.7	58.6	2225	245.0	233.2	4.4	15.5	11.9	8.7	13	98.8	68
696	12.0	57.6	2235	245.0	233.2	7.0	15.7	11.2	7.8	13	98.8	68
697	12.7	57.3	2213	245.0	233.2	6.6	15.4	11.9	6.7	13	98.8	68
698	12.2	56.6	2217	245.0	232.7	4.1	15.5	11.4	9.1	13	98.8	68
699	11.8	57.9	2234	245.0	232.3	5.5	15.6	11.1	9.0	13	98.8	68
700	14.6	57.5	2230	245.0	232.2	7.9	15.6	13.6	8.8	13	98.8	68
701	14.3	57.3	2225	245.0	232.2	8.2	15.5	13.4	9.0	13	98.8	68
702	13.4	60.1	2219	245.0	232.2	8.0	15.5	12.5	8.6	13	98.8	68
703	15.6	58.5	2232	245.0	232.2	9.9	15.6	14.6	8.2	13	98.8	68
704	15.3	57.7	2198	245.0	232.2	7.1	15.2	14.3	7.5	13	98.8	68

Table E.01 Measurement data - Turbine ON

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
705	12.7	58.3	2223	245.0	232.2	4.0	15.4	11.9	9.2	13	98.8	68
706	13.1	58.1	2231	245.0	232.2	3.3	15.7	12.2	11.4	13	98.8	68
707	13.3	56.5	2235	245.0	232.2	5.8	15.6	12.5	9.4	13	98.8	68
708	14.8	56.8	2224	245.0	232.2	7.7	15.6	13.9	9.4	13	98.8	68
709	15.7	56.8	2227	245.0	232.2	9.6	15.6	14.7	10.7	13	98.8	68
710	15.8	56.4	2214	245.0	232.2	7.7	15.4	14.8	10.1	13	98.8	68
711	14.1	57.3	2209	245.0	232.2	6.4	15.3	13.2	9.3	13	98.8	68
712	13.4	58.4	2225	245.0	232.2	3.7	15.5	12.5	7.9	13	98.8	68
713	12.8	58.4	2230	245.0	233.3	1.6	15.5	11.9	8.6	13	98.8	68
714	11.4	57.5	2235	245.0	234.0	3.4	15.6	10.7	7.5	13	98.8	68
715	12.7	57.1	2223	245.0	234.0	3.9	15.5	11.9	7.8	13	98.8	68
716	12.2	56.5	2213	245.0	234.0	3.0	15.3	11.5	8.5	13	98.8	68
717	12.0	56.4	2019	245.0	234.1	1.2	14.9	11.2	9.5	13	98.8	68
718			1944	245.0	234.1	1.2	15.4	8.7	10.0	13	98.8	68
719	11.0	57.3	2222	245.0	234.1	2.6	15.8	10.3	9.2	13	98.8	67
720	12.0	57.0	2225	245.0	234.1	3.1	15.7	11.3	9.4	13	98.8	67
721	12.0	56.5	2215	245.0	234.1	2.5	15.3	11.2	8.1	13	98.8	67
722	10.2	56.6	1882	245.0	234.1	1.4	14.9	9.1	9.2	13	98.8	67
723	10.2	56.3	1885	245.0	234.1	1.4	15.4	10.0	9.7	13	98.8	67
724	12.9	57.3	2194	245.0	234.1	0.9	15.5	12.1	9.4	13	98.8	67
725	13.3	57.6	2077	245.0	234.1	1.1	15.5	12.5	8.6	13	98.8	67
726	12.4	57.4	2237	245.0	234.1	1.5	15.8	11.6	7.8	13	98.8	67
727	11.8	57.0	2190	245.0	234.1	1.0	15.4	11.1	8.4	13	98.8	67
728	11.8	56.9	2051	245.0	234.1	1.2	15.2	11.0	8.3	13	98.8	67
729	10.3	56.9	2039	245.0	234.1	1.2	15.3	9.7	11.9	13	98.8	67
730	12.5	57.6	2198	245.0	234.1	1.0	15.6	11.7	9.3	13	98.8	67
731	13.1	57.0	2230	245.0	234.1	3.7	16.0	12.2	9.7	13	98.8	67
732	11.7	56.3	2235	245.0	234.1	2.4	15.6	11.0	9.8	13	98.8	67
733	13.8	56.5	2229	245.0	234.2	2.9	15.5	12.9	9.2	13	98.8	67
734	11.5	56.7	2015	245.0	235.8	1.2	15.0	10.8	8.4	13	98.8	67
735	9.3	55.7	1504	245.0	238.4	1.5	15.0	10.6	6.8	13	98.8	67
736	9.0	55.7	1363	245.0	239.2	1.4	15.3	8.1	5.7	13	98.8	67
737			1971	245.0	239.2	1.0	15.8	9.1	6.9	13	98.8	68
738			2063	245.0	239.0	1.1	15.4	9.5	8.0	13	98.8	68
739	11.0	56.6	1900	245.0	237.5	1.5	15.3	10.3	9.4	13	98.8	68
740	10.0	56.2	1821	245.0	237.3	1.4	15.4	11.1	9.7	13	98.8	68
741	13.4	56.6	2221	245.0	237.3	1.1	15.9	12.5	9.3	13	98.8	68
742	13.2	56.5	2166	245.0	237.3	0.9	15.4	12.3	8.3	13	98.8	68
743	9.1	55.8	1381	245.0	237.3	1.5	14.8	10.2	7.1	13	98.8	68
744	9.1	55.4	1399	245.0	237.4	1.5	15.4	10.1	7.6	13	98.8	68
745	11.9	56.1	1941	245.0	237.4	1.0	15.8	11.2	6.2	13	98.8	68
746	9.7	56.4	1668	245.0	237.4	1.4	15.1	10.5	6.1	13	98.8	68
747	9.2	55.7	1441	245.0	237.4	1.5	15.3	9.6	8.6	13	98.8	68
748	9.0	56.3	1362	245.0	238.8	1.5	15.4	9.9	7.9	13	98.8	68
749	8.5	57.0	1145	245.0	241.1	1.5	15.2	6.6	7.1	13	98.8	68
750	9.1	55.8	1379	245.0	241.6	1.1	15.7	8.4	9.2	13	98.8	68
751			2033	245.0	241.6	0.6	15.8	9.5	11.3	13	98.8	68
752	11.3	56.9	2033	245.0	241.7	1.1	15.3	10.5	10.5	13	98.8	68
753	10.2	56.6	1896	245.0	241.7	1.3	15.2	10.4	12.0	13	98.8	68
754	9.2	56.3	1448	245.0	241.7	1.5	15.1	8.3	11.5	13	98.8	68
755	9.5	56.7	1572	245.0	241.8	1.5	15.5	10.3	10.5	13	98.8	65
756	9.7	57.9	1668	245.0	241.8	1.4	15.5	9.3	11.6	13	98.8	65
757	9.8	57.4	1726	245.0	241.8	1.5	15.5	7.8	10.0	13	98.8	65
758	11.0	56.9	1974	245.0	241.8	1.1	15.5	10.3	9.2	13	98.8	65
759	10.6	56.9	2022	245.0	241.8	0.3	15.5	9.9	8.0	13	98.8	65
760	11.8	57.0	2229	245.0	241.8	0.1	15.7	11.0	9.9	13	98.8	65
761	13.0	57.1	2231	245.0	241.8	0.4	15.5	12.2	9.4	13	98.8	66
762	11.3	57.2	2208	245.0	241.8	0.4	15.5	10.6	8.1	13	98.8	66
763	11.0	56.6	2216	245.0	241.8	2.4	15.6	10.3	9.3	13	98.8	66
764	11.9	56.8	2221	245.0	241.8	4.5	15.7	11.1	10.2	13	98.8	66
765	10.9	57.1	2218	245.0	241.8	4.5	15.5	10.2	7.9	13	98.8	66
766			2228	245.0	240.6	0.9	15.6	9.6	8.3	13	98.8	66
767			1882	245.0	203.3	2.1	13.1	8.8	11.4	13	98.8	65
768			2224	245.0	238.5	0.9	15.4	11.3	9.9	13	98.8	65
769			2215	245.0	238.3	1.0	15.3	10.5	10.0	13	98.8	65
770			2215	245.0	238.3	1.0	15.3	10.5	9.7	13	98.8	65
771			2215	245.0	238.3	1.0	15.3	10.5	8.9	13	98.8	65
772			2188	245.0	238.3	1.0	15.3	10.7	10.0	13	98.8	65
773			1998	245.0	238.1	1.2	15.4	11.8	9.5	13	98.8	65
774			2046	245.0	238.1	1.1	15.4	11.1	10.4	13	98.8	65
775	10.8	56.5	1944	245.0	238.1	1.3	15.5	10.1	10.9	13	98.8	65
776	10.0	56.5	1790	245.0	238.1	1.4	15.3	9.8	10.9	13	98.8	65
777	10.0	56.3	1791	245.0	238.1	1.4	15.5	10.5	10.7	13	98.8	65
778	9.7	56.9	1685	245.0	238.1	1.5	15.2	10.4	8.9	13	98.8	65
779	8.2	55.2	1014	245.0	238.2	1.4	15.0	5.9	8.4	13	98.8	65
780	10.5	56.2	2111	245.0	238.2	5.1	16.1	9.8	8.4	13	98.8	65
781	11.9	56.8	2216	245.0	238.3	7.6	15.6	11.2	10.2	13	98.8	65
782	12.0	57.4	2230	245.0	237.1	4.6	15.5	11.2	9.6	13	98.8	65
783	12.9	56.6	2233	245.0	235.0	2.9	15.6	12.0	7.5	13	98.8	65
784	13.0	56.9	2222	245.0	234.8	2.6	15.6	12.2	7.5	13	98.8	65
785	12.5	57.4	2219	245.0	234.7	1.5	15.4	11.7	7.6	13	98.8	65
786	11.0	57.5	2213	245.0	234.7	0.8	15.3	10.3	9.8	13	98.8	65
787	11.9	57.2	2106	245.0	234.7	1.1	15.1	11.1	8.7	13	98.8	65
788	12.3	57.0	2179	245.0	234.7	1.0	15.4	11.6	9.5	13	98.8	65
789	14.0	56.9	2222	245.0	234.7	7.3	16.0	13.1	9.3	13	98.8	65
790	15.1	57.0	2224	245.0	234.7	6.6	15.4	14.2	10.5	13	98.8	65
791	12.2	56.7	2231	245.0	234.7	5.1	15.5	11.4	9.3	13	98.8	65
792	11.6	56.4	2229	245.0	234.7	3.7	15.5	10.8	8.6	13	98.8	65

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
793	12.0	57.1	2213	245.0	234.0	1.2	15.4	11.2	9.2	13	98.8	65
794			2234	245.0	233.9	4.2	15.7	9.5	7.7	13	98.8	65
795	11.7	56.6	2223	245.0	233.7	3.6	15.4	11.0	5.8	13	98.8	65
796	11.7	57.2	2217	245.0	233.7	1.7	15.4	10.9	5.6	13	98.8	65
797	12.4	57.3	2219	245.0	233.7	0.9	15.5	11.7	7.2	13	98.8	66
798	12.2	57.2	2234	245.0	233.7	0.8	15.5	11.4	8.6	13	98.8	66
799	12.0	57.4	2012	245.0	233.7	1.2	14.9	11.2	8.3	13	98.8	66
800	12.0	56.4	2085	245.0	233.7	1.1	15.5	11.3	7.5	13	98.8	66
801	11.5	57.3	2103	245.0	233.7	1.1	15.2	10.8	7.9	13	98.8	66
802	9.3	56.7	1487	245.0	233.7	1.5	15.0	10.0	7.5	13	98.8	66
803	9.3	56.0	1474	245.0	234.0	1.5	15.4	9.3	10.1	13	98.7	66
804	9.8	56.7	1716	245.0	236.2	1.5	15.6	10.0	10.4	13	98.7	66
805	9.7	56.5	1685	245.0	237.1	1.5	15.4	10.1	10.1	13	98.7	66
806	11.0	56.6	2146	245.0	237.2	0.9	15.8	10.3	8.9	13	98.7	66
807	10.9	56.5	1899	245.0	237.2	1.4	15.1	10.2	9.2	13	98.7	66
808	9.3	56.2	1503	245.0	237.2	1.5	15.1	9.1	8.2	13	98.7	66
809	8.2	55.4	1003	245.0	237.2	1.5	15.0	8.0	8.2	13	98.8	66
810	10.5	56.0	1916	245.0	237.2	1.0	15.8	9.8	10.0	13	98.8	66
811	12.7	57.0	2222	245.0	237.2	1.7	15.7	11.9	8.5	13	98.8	66
812	10.8	57.1	2211	245.0	237.2	0.9	15.4	10.1	8.4	13	98.8	66
813	13.6	56.7	2203	245.0	237.2	2.7	15.6	12.7	10.2	13	98.8	66
814	11.7	56.4	2226	245.0	237.3	3.8	15.6	11.0	8.6	13	98.8	66
815	10.6	58.2	2229	245.0	237.3	2.9	15.6	9.9	8.7	13	98.7	65
816			2222	245.0	237.3	1.4	15.4	9.5	9.2	13	98.7	65
817	10.8	56.9	2109	245.0	237.0	1.1	15.0	10.1	11.6	13	98.7	65
818	12.5	57.2	2231	245.0	236.5	3.0	15.8	11.7	11.6	13	98.7	65
819	12.3	57.3	2224	245.0	236.5	5.6	15.6	11.6	9.8	13	98.7	65
820	12.2	57.2	2225	245.0	236.5	3.7	15.4	11.4	9.3	13	98.7	65
821	12.3	56.9	2221	245.0	236.5	1.5	15.5	11.5	9.8	13	98.7	65
822	12.9	57.5	2225	245.0	236.5	2.7	15.6	12.1	8.9	13	98.8	64
823	11.4	58.1	2215	245.0	236.5	2.0	15.4	10.7	6.9	13	98.8	64
824	11.2	57.8	2228	245.0	236.5	1.5	15.5	10.4	6.1	13	98.8	64
825	11.6	57.2	2218	245.0	236.5	0.5	15.4	10.9	6.9	13	98.8	64
826	11.8	57.8	2232	245.0	236.5	1.2	15.5	11.0	9.5	13	98.8	64
827	11.9	57.3	2207	245.0	236.5	0.8	15.3	11.2	9.9	13	98.8	65
828	9.3	56.5	1483	245.0	236.5	1.4	14.6	9.5	9.4	13	98.8	65
829	9.7	55.7	1673	245.0	236.5	1.3	15.6	8.3	9.3	13	98.8	65
830	10.3	56.9	1909	245.0	236.5	1.4	15.5	9.6	7.3	13	98.8	65
831	11.8	57.6	2054	245.0	236.5	1.1	15.5	11.1	7.8	13	98.8	65
832	11.0	57.3	2061	245.0	236.5	1.1	15.3	10.3	7.8	13	98.8	65
833	9.8	56.3	1731	245.0	236.5	1.5	15.2	9.5	8.3	13	98.8	65
834	10.1	56.4	1853	245.0	237.2	1.4	15.5	9.4	7.9	13	98.8	66
835			1952	245.0	237.9	1.3	15.5	9.0	7.5	13	98.8	66
836	10.7	56.7	2097	245.0	237.9	1.0	15.5	10.0	8.5	13	98.8	66
837	9.7	55.9	1649	245.0	238.0	0.6	15.1	9.1	8.3	13	98.8	66
838	9.1	55.2	1379	245.0	238.0	0.5	15.2	9.6	9.4	13	98.8	66
839	9.1	55.4	1394	245.0	238.0	0.5	15.4	8.6	8.8	13	98.8	66
840	9.7	55.6	1658	245.0	239.5	0.4	15.7	8.8	8.9	13	98.8	66
841	12.3	56.5	2120	245.0	240.4	0.1	15.7	11.5	10.6	13	98.8	66
842	10.1	56.7	1859	245.0	240.5	0.4	15.3	10.2	9.9	13	98.8	66
843	11.9	57.1	1930	245.0	240.5	1.3	15.4	11.1	11.6	13	98.8	66
844	10.1	56.7	1830	245.0	240.5	1.5	15.4	9.2	12.7	13	98.8	66
845	10.2	57.2	1878	245.0	240.5	1.4	15.5	8.8	11.0	13	98.7	64
846	10.7	57.6	2169	245.0	240.4	1.4	15.9	10.0	9.8	13	98.7	64
847			2224	245.0	240.3	2.7	15.7	8.6	10.0	13	98.7	64
848	12.5	57.7	2228	245.0	239.5	1.4	15.6	11.7	8.0	13	98.7	64
849	10.1	57.1	1855	245.0	238.1	1.2	14.8	9.0	9.8	13	98.7	64
850			1171	245.0	238.3	1.5	15.0	8.6	10.3	13	98.7	64
851	8.8	56.4	1277	245.0	240.4	1.4	15.5	7.7	9.6	13	98.7	65
852	9.5	57.0	1572	245.0	241.3	1.4	15.6	5.9	8.1	13	98.8	65
853			2156	245.0	241.3	1.9	15.9	8.8	9.5	13	98.8	65
854	11.2	56.8	2221	245.0	240.4	2.5	15.7	10.5	8.4	13	98.8	65
855	11.8	57.1	2234	245.0	239.5	4.2	15.6	11.0	10.3	13	98.8	65
856	11.2	57.7	2208	245.0	239.5	2.4	15.3	10.5	9.2	13	98.8	65
857	12.8	57.5	2223	245.0	239.4	3.3	15.7	12.0	8.2	13	98.8	66
858	11.4	57.0	2226	245.0	239.1	3.7	15.4	10.7	8.4	13	98.8	66
859	11.6	57.0	2231	245.0	238.7	3.1	15.5	10.9	6.7	13	98.8	66
860	10.7	57.6	2213	245.0	238.7	1.8	15.4	10.0	7.3	13	98.8	66
861	10.8	57.3	2207	245.0	238.5	0.9	15.3	10.1	6.3	13	98.8	66
862			2193	245.0	237.3	1.0	15.2	9.4	8.6	13	98.8	66
863	9.9	56.5	1745	245.0	237.2	1.4	14.8	11.0	8.3	13	98.7	65
864	9.7	55.9	1665	245.0	237.2	1.4	15.4	9.2	7.1	13	98.7	65
865	11.2	56.7	2120	245.0	237.2	1.0	15.7	10.4	6.9	13	98.7	65
866	12.4	56.8	2050	245.0	237.2	1.1	15.4	11.6	7.6	13	98.7	65
867	10.7	56.8	2031	245.0	237.2	1.2	15.4	10.1	6.6	13	98.7	65
868	11.7	57.1	2229	245.0	237.2	1.0	15.6	11.0	7.4	13	98.7	65
869	10.7	57.0	2032	245.0	237.2	1.2	15.3	10.0	9.5	13	98.7	66
870	11.3	57.1	2110	245.0	237.2	1.1	15.4	10.6	10.8	13	98.7	66
871			1917	245.0	237.2	1.3	15.3	8.6	9.8	13	98.7	66
872			1498	245.0	237.2	1.4	15.1	8.2	11.6	13	98.7	66
873	13.0	56.8	2187	245.0	237.2	0.6	15.9	12.1	10.9	13	98.7	66
874	12.9	57.1	2233	245.0	237.2	0.7	15.8	12.1	9.9	13	98.7	66
875	11.5	56.5	2238	245.0	237.2	2.0	15.7	10.7	8.7	13	98.7	65
876	13.2	57.1	2222	245.0	237.2	2.5	15.5	12.4	8.7	13	98.7	65
877	12.4	57.0	2176	245.0	237.2	0.9	15.2	11.6	9.0	13	98.7	65
878	12.2	56.5	2196	245.0	237.2	1.9	15.5	11.4	9.6	13	98.7	65
879	14.0	57.4	2229	245.0	237.8	6.0	15.7	13.2	8.0	13	98.7	65
880	12.2	57.1	2220	245.0	238.8	5.1	15.5	11.4	9.6	13	98.7	65

Table E.01 Measurement data - Turbine ON

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
881	13.6	58.6	2231	245.0	238.8	6.5	15.6	12.8	8.7	13	98.7	65
882	15.3	58.4	2230	245.0	238.8	8.0	15.5	14.3	10.1	13	98.7	65
883	14.7	58.8	2218	245.0	238.8	7.4	15.4	13.8	10.3	13	98.7	65
884	14.5	57.4	2218	245.0	238.8	5.8	15.5	13.6	9.4	13	98.7	65
885	13.3	58.9	2214	245.0	238.9	4.1	15.4	12.5	12.1	13	98.7	65
886	10.8	58.1	2228	245.0	240.4	3.0	15.5	10.2	12.5	13	98.7	65
887	10.8	57.0	2225	245.0	240.4	5.7	15.6	10.1	12.2	13	98.7	65
888	13.6	56.6	2223	245.0	238.3	7.8	15.6	12.7	11.6	13	98.7	64
889	13.4	56.2	2223	245.0	237.2	7.5	15.5	12.6	10.5	13	98.7	64
890	14.1	56.4	2213	245.0	237.1	7.0	15.4	13.2	8.9	13	98.7	64
891	14.4	56.3	2231	245.0	237.1	7.6	15.7	13.5	8.3	13	98.7	64
892	13.9	57.5	2220	245.0	237.0	9.2	15.5	13.0	8.3	13	98.7	64
893	14.3	57.4	2200	245.0	235.3	7.0	15.3	13.4	9.4	13	98.7	65
894	13.7	56.3	2220	245.0	234.3	3.8	15.5	12.8	8.5	13	98.7	65
895	12.5	57.1	2230	245.0	234.3	3.5	15.5	11.7	8.2	13	98.7	65
896	13.2	57.6	2231	245.0	234.3	3.8	15.5	12.4	9.2	13	98.7	65
897	11.5	57.9	2223	245.0	234.3	2.2	15.5	10.8	8.0	13	98.7	65
898	11.2	57.2	2229	245.0	234.3	3.3	15.5	10.5	8.3	13	98.7	65
899	14.2	57.5	2232	245.0	234.1	6.0	15.6	13.3	6.9	13	98.7	65
900	14.8	57.3	2204	245.0	234.1	4.5	15.4	13.8	7.9	13	98.7	65
901	13.7	57.8	2220	245.0	234.0	5.8	15.5	12.8	7.2	13	98.7	65
902	12.0	57.7	2220	245.0	234.0	3.6	15.5	11.3	8.2	13	98.7	65
903	13.8	57.2	2223	245.0	234.0	7.5	15.7	12.9	9.6	13	98.7	65
904	13.5	58.3	2225	245.0	234.1	7.6	15.5	12.6	7.6	13	98.7	65
905	14.6	57.8	2227	245.0	234.2	7.5	15.5	13.6	6.6	13	98.7	65
906	15.4	57.3	2218	245.0	234.3	8.6	15.5	14.4	7.6	13	98.8	65
907	14.3	58.0	2200	245.0	234.3	5.0	15.3	13.4	7.6	13	98.8	65
908	11.7	58.2	2236	245.0	234.3	3.3	15.6	10.9	7.1	13	98.8	65
909	12.3	57.5	2233	245.0	234.3	5.3	15.6	11.5	8.6	13	98.8	65
910	11.0	57.4	2194	245.0	234.3	1.7	15.3	10.3	11.3	13	98.8	65
911	12.5	57.5	2225	245.0	234.3	1.7	15.6	11.7	11.8	13	98.7	64
912	14.4	56.7	2238	245.0	234.3	5.7	15.7	13.5	10.0	13	98.7	64
913	13.6	57.6	2210	245.0	234.3	6.1	15.4	12.7	9.6	13	98.7	64
914	13.5	58.0	2226	245.0	234.3	6.5	15.6	12.7	9.5	13	98.7	64
915	11.2	57.3	2207	245.0	234.3	5.2	15.3	10.5	8.4	13	98.7	64
916	10.8	56.7	2212	245.0	234.3	1.0	15.4	10.1	7.5	13	98.7	64
917	13.6	57.2	2234	245.0	234.3	5.1	15.7	12.8	9.3	13	98.7	64
918	14.2	56.7	2233	245.0	234.3	6.6	15.5	13.3	11.4	13	98.7	64
919	14.7	57.3	2237	245.0	234.4	8.7	15.6	13.8	10.0	13	98.7	64
920	14.1	59.8	2211	245.0	234.4	8.1	15.4	13.2	10.2	13	98.7	64
921	13.0	58.7	2219	245.0	234.4	5.3	15.4	12.2	11.6	13	98.7	64
922	11.6	57.9	2238	245.0	234.4	5.0	15.6	10.9	12.1	13	98.7	64
923	12.6	58.1	2227	245.0	234.4	7.3	15.6	11.8	11.6	13	98.7	64
924	12.6	57.0	2199	245.0	234.3	4.1	15.3	11.8	11.8	13	98.7	64
925	12.0	57.4	2230	245.0	234.1	3.9	15.7	11.2	10.9	13	98.7	64
926	10.8	56.8	2214	245.0	233.8	5.2	15.4	10.1	9.6	13	98.7	64
927	13.8	56.8	2220	245.0	233.8	7.2	15.7	13.0	10.2	13	98.7	64
928	14.5	56.4	2234	245.0	233.8	7.8	15.5	13.5	8.4	13	98.7	64
929	13.4	58.2	2219	245.0	233.8	6.3	15.4	12.5	8.2	13	98.7	64
930	13.5	57.7	2207	245.0	233.8	3.8	15.4	12.6	8.5	13	98.7	65
931	13.3	58.7	2226	245.0	233.8	3.2	15.7	12.4	10.7	13	98.7	65
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***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAeq	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 (kPa)	Relative Humidity (%)
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Table E.02 Measurement data - Background

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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

Data Point #	Standardized Wind Speed	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (kPa)	Relative Humidity (%)
1	5.4	42.7	0.1	4.2	13	98.7	43
2	4.8	42.9	0.2	3.7	13	98.7	43
3	5.3	42.7	0.2	4.1	13	98.7	43
4	6.0	43.2	0.3	4.7	13	98.7	43
5	6.3	43.4	0.3	4.9	13	98.7	43
6	8.3	43.2	0.4	6.4	13	98.7	43
7	7.9	43.7	0.4	6.1	13	98.7	43
8	7.2	43.4	0.3	5.6	13	98.7	44
9	7.6	44.0	0.5	5.8	13	98.7	44
10	8.1	43.9	0.5	6.3	13	98.7	44
11	9.3	43.9	0.5	7.2	13	98.7	44
12	8.1	44.4	0.5	6.3	13	98.7	44
13	7.1	44.7	0.5	5.5	13	98.7	43
14	10.1	45.6	0.4	7.8	13	98.7	42
15	10.5	45.6	0.5	8.1	13	98.7	42
16	11.4	44.8	0.8	8.8	13	98.7	42
17	11.6	45.6	0.7	9.0	13	98.7	42
18	10.4	45.4	0.8	8.0	13	98.7	42
19	10.8	50.3	0.8	8.3	13	98.7	42
20	12.3	47.4	0.8	9.5	13	98.7	41
21	12.5	48.1	0.6	9.7	13	98.7	41
22	11.8	48.2	0.7	9.1	13	98.7	41
23	11.2	49.0	0.7	8.6	13	98.7	41
24	11.3	49.4	0.5	8.7	13	98.7	41
25	11.6	48.2	0.5	8.9	13	98.7	41
26	11.0	47.5	0.4	8.5	13	98.7	42
27	9.7	47.9	0.6	7.5	13	98.7	42
28	10.0	47.0	0.5	7.7	13	98.7	42
29	9.4	46.9	0.5	7.3	13	98.7	42
30	8.8	46.8	0.5	6.8	13	98.7	42
31	8.9	47.3	0.3	6.9	13	98.7	43
32	8.8	45.1	0.3	6.8	13	98.7	44
33	9.6	46.6	0.6	7.4	13	98.7	44
34	9.9	46.5	0.8	7.7	13	98.7	44
35	9.0	45.9	0.5	6.9	13	98.7	44
36	8.6	45.8	0.4	6.6	13	98.7	44
37	9.9	44.5	0.3	7.7	13	98.7	44
38	10.6	45.1	0.7	8.2	13	98.7	44
39	10.5	44.7	0.8	8.1	13	98.7	44
40	10.4	45.7	0.7	8.0	13	98.7	44
41	9.5	43.5	0.4	7.3	13	98.7	44
42	8.1	43.3	0.5	6.2	13	98.7	44
43	7.7	43.5	0.6	5.9	13	98.7	43
44	7.4	44.2	0.7	5.7	13	98.7	43
45	7.0	44.4	0.8	5.4	13	98.7	43
46	6.8	44.2	0.8	5.2	13	98.7	43
47	8.2	44.3	0.8	6.3	13	98.7	43
48	8.5	45.7	0.5	6.5	13	98.7	43
49			0.3	6.2	13	98.7	44
50			0.3	5.7	13	98.7	46
51			0.5	5.8	13	98.7	46
52			0.7	6.8	13	98.7	46
53	8.5	45.7	0.5	6.5	13	98.7	46
54	7.2	43.4	0.5	5.5	13	98.7	46
55	7.4	43.1	0.6	5.7	13	98.7	46
56	8.6	43.2	0.4	6.6	13	98.7	46
57	6.8	43.7	0.2	5.3	13	98.7	46
58	7.1	44.0	0.4	5.5	13	98.7	46
59	9.3	43.7	0.3	7.2	13	98.7	46
60	7.2	43.8	0.3	5.6	13	98.7	46
61	7.3	43.1	0.3	5.7	13	98.7	46
62	7.7	43.2	0.3	5.9	13	98.8	46
63	7.4	43.7	0.3	5.7	13	98.8	46
64	6.8	43.0	0.3	5.3	13	98.8	46
65	6.5	42.4	0.2	5.0	13	98.8	46
66	6.2	42.7	0.3	4.8	13	98.8	46
67	6.0	42.4	0.2	4.7	13	98.8	46
68	6.7	42.2	0.1	5.2	13	98.8	46
69	6.3	42.2	0.1	4.9	13	98.8	46
70	5.3	42.1	0.1	4.1	13	98.8	46
71	6.6	42.0	0.2	5.1	13	98.8	46
72	6.8	41.9	0.2	5.3	13	98.8	46
73	6.8	42.0	0.2	5.3	13	98.8	47
74	5.8	41.9	0.3	4.5	13	98.8	47
75	6.4	41.9	0.3	5.0	13	98.8	47
76	7.9	41.8	0.3	6.1	13	98.8	47
77	5.8	42.2	0.4	4.5	13	98.8	47
78	6.7	42.6	0.3	5.2	13	98.8	47
79	6.2	42.3	0.5	4.8	13	98.8	48
80	6.1	42.3	0.5	4.7	13	98.8	48
81	6.3	42.7	0.3	4.9	13	98.8	48
82	7.1	43.6	0.3	5.5	13	98.8	48
83	7.7	44.3	0.3	6.0	13	98.8	48

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

Data Point #	Standardized Wind Speed	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (kPa)	Relative Humidity (%)
84	8.0	43.4	0.4	6.2	13	98.8	48
85	7.0	43.2	0.3	5.4	13	98.7	45
86	6.8	43.3	0.2	5.2	13	98.7	43
87	7.3	43.7	0.3	5.6	13	98.7	43
88	8.5	44.1	0.3	6.6	13	98.7	43
89	9.4	43.9	0.4	7.2	13	98.7	43
90	8.4	44.0	0.6	6.5	13	98.7	43
91	7.3	44.2	0.7	5.6	13	98.7	43
92	7.2	43.9	0.8	5.5	13	98.7	44
93	7.2	44.8	0.7	5.6	13	98.7	44
94	7.8	46.6	0.6	6.0	13	98.7	44
95	7.9	48.2	0.6	6.1	13	98.7	44
96	8.1	49.2	0.6	6.3	13	98.7	44
97	9.7	48.5	0.7	7.5	13	98.7	45
98	11.4	49.6	0.8	8.8	13	98.7	45
99	10.0	48.4	0.7	7.7	13	98.7	45
100	9.2	48.5	0.6	7.1	13	98.7	45
101	10.7	47.9	0.4	8.3	13	98.7	45
102	9.6	47.7	0.7	7.4	13	98.7	45
103	8.9	46.8	0.6	6.9	13	98.7	46
104	8.1	46.7	0.5	6.2	13	98.8	46
105	8.7	45.8	0.3	6.7	13	98.8	46
106	10.1	44.7	0.5	7.8	13	98.8	46
107	10.1	44.9	0.5	7.8	13	98.8	46
108	9.5	46.1	0.6	7.3	13	98.8	46
109	9.3	44.8	0.7	7.2	13	98.8	46
110	8.4	45.8	0.7	6.5	13	98.8	46
111	6.9	45.8	0.7	5.3	13	98.8	46
112	7.8	45.2	0.7	6.1	13	98.8	46
113	9.3	45.0	0.6	7.2	13	98.8	46
114	10.9	47.3	0.8	8.4	13	98.8	46
115	10.7	49.1	0.6	8.3	13	98.7	45
116	12.0	51.1	0.5	9.2	13	98.7	44
117	10.9	47.1	0.5	8.4	13	98.7	44
118	10.1	47.8	0.6	7.8	13	98.7	44
119	10.1	45.9	0.5	7.8	13	98.7	44
120	10.2	44.7	0.4	7.9	13	98.7	44
121	9.5	44.3	0.4	7.4	13	98.7	44
122	8.6	44.1	0.5	6.6	13	98.8	44
123	8.8	44.4	0.5	6.8	13	98.8	44
124	8.6	44.3	0.4	6.7	13	98.8	44
125	7.6	44.1	0.4	5.9	13	98.8	44
126	8.3	45.2	0.5	6.4	13	98.8	44
127	10.4	45.9	0.5	8.1	13	98.8	45
128	11.7	44.2	0.5	9.0	13	98.8	46
129	10.5	44.3	0.4	8.1	13	98.8	46
130	9.4	46.8	0.5	7.2	13	98.8	46
131	9.6	48.1	0.5	7.4	13	98.8	46
132	9.0	48.4	0.3	7.0	13	98.8	46
133	9.5	45.5	0.3	7.3	13	98.8	47
134	9.8	44.1	0.3	7.5	13	98.8	48
135	8.1	43.8	0.4	6.3	13	98.8	48
136	8.0	44.6	0.5	6.2	13	98.8	48
137	9.7	44.6	0.5	7.5	13	98.8	48
138	10.9	48.1	0.4	8.5	13	98.8	48
139	12.2	50.8	0.3	9.4	13	98.8	47
140	13.3	48.7	0.3	10.3	13	98.8	46
141	12.1	47.2	0.3	9.3	13	98.8	46
142	9.6	45.3	0.4	7.4	13	98.8	46
143	8.0	44.9	0.2	6.2	13	98.8	46
144	9.1	46.0	0.2	7.0	13	98.8	46
145	8.1	44.9	0.1	6.2	13	98.8	45
146	6.5	42.7	0.1	5.1	13	98.8	44
147	6.6	42.4	0.2	5.1	13	98.8	44
148	7.8	42.6	0.2	6.0	13	98.8	44
149	5.6	42.5	0.4	4.4	13	98.8	44
150	6.4	42.5	0.3	4.9	13	98.8	44
151	6.9	42.2	0.2	5.3	13	98.8	45
152	7.0	42.0	0.2	5.4	13	98.8	47
153	6.1	42.2	0.2	4.7	13	98.8	47
154	7.6	42.5	0.3	5.8	13	98.8	47
155	7.9	43.5	0.3	6.1	13	98.8	47
156	8.2	44.9	0.5	6.3	13	98.8	47
157	10.7	44.7	0.5	8.2	13	98.8	47
158	10.0	43.8	0.4	7.8	13	98.8	46
159	9.3	43.1	0.2	7.2	13	98.8	46
160	7.8	43.0	0.2	6.1	13	98.8	46
161	6.4	44.3	0.3	4.9	13	98.8	46
162	6.6	45.9	0.4	5.1	13	98.8	46
163	8.7	46.3	0.6	6.8	13	98.8	46
164	8.5	45.9	0.4	6.6	13	98.8	46
165	8.4	48.2	0.5	6.5	13	98.8	46
166	10.9	46.4	0.6	8.4	13	98.8	46

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

Data Point #	Standardized Wind Speed	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (kPa)	Relative Humidity (%)
167	11.5	47.0	0.6	8.9	13	98.8	46
168	11.4	47.2	0.5	8.8	13	98.8	46
169	11.4	46.2	0.5	8.8	13	98.8	45
170	11.0	47.6	0.5	8.5	13	98.8	44
171	11.1	48.4	0.5	8.6	13	98.8	44
172	13.2	46.9	0.3	10.2	13	98.8	44
173	11.9	45.6	0.6	9.2	13	98.8	44
174	10.9	44.5	0.6	8.5	13	98.8	44
175	9.5	43.8	0.5	7.4	13	98.8	44
176	9.1	43.4	0.5	7.1	13	98.8	45
177	7.4	43.0	0.6	5.7	13	98.8	45
178	7.3	43.0	0.6	5.7	13	98.8	45
179	6.9	42.8	0.4	5.3	13	98.8	45
180	6.7	43.4	0.5	5.2	13	98.8	45
181	6.7	44.0	0.7	5.2	13	98.8	46
182	7.7	43.4	0.5	5.9	13	98.8	48
183	8.6	44.5	0.3	6.6	13	98.8	48
184	8.3	46.5	0.3	6.4	13	98.8	48
185	6.6	46.0	0.3	5.1	13	98.8	48
186	6.2	43.8	0.3	4.8	13	98.8	48
187	5.5	43.4	0.3	4.3	13	98.8	48
188	5.4	43.1	0.4	4.2	13	98.8	49
189	5.0	42.3	0.3	3.9	13	98.8	49
190	5.2	42.1	0.3	4.0	13	98.8	49
191	4.3	42.1	0.3	3.3	13	98.8	49
192	3.0	42.1	0.3	2.4	13	98.8	49
193	3.3	42.0	0.2	2.6	13	98.8	50
194	6.0	42.0	0.2	4.6	13	98.8	51
195	11.4	51.1	0.8	8.8	13	98.7	65
196	12.0	50.4	0.6	9.3	13	98.7	65
197	10.3	53.6	0.5	7.9	13	98.7	65
198	8.1	52.3	0.7	6.3	13	98.7	65
199	9.3	52.6	0.6	7.2	13	98.7	66
200	12.4	52.7	0.6	9.5	13	98.7	66
201	13.1	52.8	0.7	10.1	13	98.7	66
202	12.9	49.4	0.7	10.0	13	98.7	66
203	12.7	51.1	0.6	9.8	13	98.7	66
204	13.9	51.5	0.7	10.8	13	98.7	66
205	10.6	48.6	0.8	8.2	13	98.7	66
206	10.4	49.4	0.6	8.1	13	98.7	66
207	13.1	49.0	0.6	10.2	13	98.7	66
208	13.2	47.5	0.6	10.2	13	98.7	66
209	10.9	47.4	0.7	8.4	13	98.7	66
210	10.9	51.8	0.7	8.5	13	98.7	66
211	10.3	51.6	0.8	8.0	13	98.7	66
212	10.0	50.2	0.9	7.7	13	98.7	66
213	13.1	49.0	0.6	10.2	13	98.7	66
214	12.4	49.4	0.6	9.6	13	98.7	66
215	11.8	51.8	0.6	9.2	13	98.7	66
216	10.6	51.8	0.4	8.2	13	98.7	66
217	15.0	48.7	0.6	11.6	13	98.7	65
218	13.7	47.2	0.8	10.6	13	98.7	65
219	15.3	46.6	0.7	11.9	13	98.7	65
220	13.2	48.8	0.5	10.2	13	98.7	65
221	12.5	49.2	0.6	9.7	13	98.7	65
222	11.4	48.0	0.4	8.8	13	98.7	65
223	14.4	47.7	0.5	11.2	13	98.7	66
224	12.7	46.5	0.5	9.8	13	98.7	66
225	13.4	46.6	0.6	10.4	13	98.7	66
226	12.2	47.5	0.7	9.5	13	98.7	66
227	12.0	46.1	0.4	9.3	13	98.7	66
228	11.6	47.6	0.6	9.0	13	98.7	66
229	9.4	51.6	0.6	7.3	13	98.7	66
230	11.2	50.2	0.7	8.7	13	98.7	67
231	12.7	51.1	0.7	9.8	13	98.7	67
232	11.6	49.9	0.8	9.0	13	98.7	67
233	11.2	51.7	0.7	8.7	13	98.7	67
234			0.5	8.7	13	98.7	67
235			0.8	8.2	13	98.7	66
236			0.7	7.7	13	98.7	66
237			0.7	8.7	13	98.7	66
238	11.2	52.8	0.7	8.7	13	98.7	66
239	9.4	54.4	0.5	7.3	13	98.7	66
240	10.6	53.2	0.5	8.2	13	98.7	66
241	10.6	50.3	0.7	8.2	13	98.7	67
242	10.9	52.2	0.7	8.4	13	98.7	67
243	12.1	50.9	0.7	9.4	13	98.7	67
244	12.1	50.8	0.7	9.3	13	98.7	67
245	11.2	50.9	0.6	8.7	13	98.7	67
246	12.5	52.9	0.6	9.7	13	98.7	67
247			0.7	9.8	13	98.7	66
248	12.9	51.5	0.7	9.9	13	98.7	66
249			0.9	9.5	13	98.7	66

Table E.02 Measurement data - Background

Project: Summerhaven Wind Energy Centre - Turbine T24 - IEC 61400-11 Measurement

Report ID: 13259.00.T24.RP3

Created on: 10/11/2017

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

Data Point #	Standardized Wind Speed	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (kPa)	Relative Humidity (%)
250			0.8	8.5	13	98.7	66
251			0.9	7.6	13	98.7	66
252			0.7	8.9	13	98.7	66
253			0.6	8.3	13	98.7	66
254	10.7	52.4	0.7	8.3	13	98.7	66
255	12.1	51.3	0.7	9.3	13	98.7	66
256	12.9	50.9	0.7	10.0	13	98.7	66
257	12.0	47.7	0.3	9.3	13	98.7	66
258	13.3	48.2	0.5	10.3	13	98.7	66
259	11.3	48.3	0.7	8.7	13	98.7	66
260	12.0	47.2	0.7	9.3	13	98.7	66
261	13.7	49.2	0.7	10.6	13	98.7	66
262	14.6	49.2	0.4	11.3	13	98.7	66
263	12.2	49.1	0.4	9.5	13	98.7	66
264	12.9	50.9	0.6	10.0	13	98.7	66
265	11.0	50.5	0.5	8.5	13	98.7	66
266	10.0	53.2	0.5	7.7	13	98.7	66
267	11.6	52.8	0.9	9.0	13	98.7	66
268	9.6	54.2	0.9	7.4	13	98.7	66
269	8.9	53.0	0.9	6.9	13	98.7	66
270	10.0	53.7	0.6	7.7	13	98.7	66
271	10.7	53.9	0.5	8.2	13	98.7	67
272	10.4	53.0	0.5	8.0	13	98.7	67
273	9.5	53.0	0.6	7.3	13	98.7	67
274	9.8	50.2	0.5	7.6	13	98.7	67
275	8.0	49.0	0.6	6.2	13	98.7	67
276	9.6	48.2	0.4	7.4	13	98.7	67
277	9.1	47.9	0.5	7.1	13	98.7	67
278	8.7	45.9	0.5	6.7	13	98.7	67
279	8.9	47.1	0.7	6.9	13	98.7	67
280	9.3	49.5	0.5	7.2	13	98.7	67
281	10.4	47.4	0.5	8.0	13	98.7	67
282	8.8	46.4	0.3	6.8	13	98.7	67
283	6.8	49.1	0.5	5.3	13	98.7	67
284	9.4	48.5	0.6	7.2	13	98.7	68
285	9.3	46.1	0.4	7.2	13	98.7	68
286	10.2	44.8	0.6	7.9	13	98.7	68
287	10.8	45.6	0.6	8.3	13	98.7	68
288	9.5	46.8	0.8	7.4	13	98.7	68
289	9.8	49.8	0.8	7.6	13	98.7	67
290	10.5	50.6	0.6	8.1	13	98.7	67
291	10.2	49.1	0.4	7.9	13	98.7	67
292	11.4	48.4	0.6	8.8	13	98.7	67
293	9.9	47.1	0.4	7.7	13	98.7	67
294	9.6	45.6	0.5	7.4	13	98.7	67
295	10.1	45.8	0.8	7.8	13	98.7	67
296	10.3	45.8	0.6	8.0	13	98.7	67
297	9.3	45.3	0.5	7.2	13	98.7	67
298	12.1	47.7	0.6	9.3	13	98.7	67
299	14.1	44.8	0.5	10.9	13	98.7	67
300	11.6	44.1	0.6	9.0	13	98.7	67
301	12.4	44.7	0.5	9.6	13	98.7	67
302	11.2	48.2	0.6	8.6	13	98.7	66
303	10.4	46.0	0.6	8.0	13	98.7	66
304	11.4	50.0	0.5	8.8	13	98.7	66
305	11.0	50.1	0.6	8.5	13	98.7	66
306	13.6	53.0	0.5	10.5	13	98.7	66
307	12.0	53.6	0.7	9.3	13	98.7	66
308	13.6	49.6	0.7	10.6	13	98.7	66
309	13.3	48.6	0.9	10.3	13	98.7	66
310	16.0	54.7	0.8	12.4	13	98.7	66
311			0.7	11.3	13	98.7	66
312	13.1	54.8	0.6	10.1	13	98.7	66
313	13.9	53.3	0.6	10.7	13	98.7	66
314	12.8	50.6	0.5	9.9	13	98.7	65
315	15.3	46.2	0.6	11.8	13	98.7	65
316	13.5	49.4	0.6	10.4	13	98.7	65
317	16.1	46.8	0.5	12.5	13	98.7	65
318	15.7	45.3	0.6	12.2	13	98.7	65
319	14.0	50.8	0.6	10.8	13	98.7	65
320	12.3	50.4	0.7	9.5	13	98.7	65
321	12.4	47.2	0.6	9.6	13	98.7	65
322	11.7	52.9	0.7	9.1	13	98.7	65
323	10.9	48.1	0.6	8.4	13	98.7	65
324	11.1	46.6	0.4	8.6	13	98.7	65
325	12.5	49.2	0.6	9.7	13	98.7	65
326	13.5	49.8	0.6	10.4	13	98.7	65
327	14.8	45.8	0.7	11.4	13	98.7	65
328	13.2	48.6	0.4	10.2	13	98.7	65
329	14.8	53.2	0.6	11.5	13	98.7	65
330	13.4	53.7	0.7	10.3	13	98.7	65
331	12.2	53.8	0.7	9.5	13	98.7	65
332	8.3	54.9	0.6	6.5	13	98.7	65

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

Data Point #	Standardized Wind Speed	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (kPa)	Relative Humidity (%)
333	9.1	50.8	0.7	7.0	13	98.7	65
334	9.4	52.4	0.5	7.2	13	98.7	65
335	11.4	51.6	0.5	8.8	13	98.7	65
336	12.5	48.4	0.6	9.6	13	98.7	65
337	12.7	47.3	0.6	9.8	13	98.7	65
338	11.4	49.5	0.7	8.8	13	98.7	65
339	11.4	51.4	0.5	8.8	13	98.7	65
340	9.9	54.2	0.7	7.6	13	98.7	65
341	10.3	54.7	0.6	7.9	13	98.7	65
342	11.4	48.9	0.9	8.8	13	98.7	65
343	12.5	50.1	0.9	9.7	13	98.7	65
344	9.0	49.8	0.8	7.0	13	98.7	65
345	11.4	53.4	0.7	8.8	13	98.7	65
346	11.9	53.3	0.5	9.2	13	98.7	65
347	11.4	50.4	0.5	8.8	13	98.7	65
348	12.2	46.6	0.7	9.4	13	98.7	65
349	14.8	50.6	0.7	11.4	13	98.7	65
350	14.4	51.8	0.7	11.1	14	98.7	65
351	11.7	53.2	0.7	9.1	14	98.7	65
352	13.2	54.7	0.7	10.2	14	98.7	65
353	12.0	55.1	0.7	9.3	14	98.7	65
354	11.1	52.0	0.8	8.6	14	98.7	65
355	9.0	50.3	0.6	6.9	14	98.7	65
356	10.7	51.4	0.8	8.3	14	98.7	65
357			0.9	10.8	14	98.7	65
358			0.8	9.9	14	98.7	65
359			0.5	8.8	14	98.7	65
360	10.4	53.1	0.6	8.0	14	98.7	65
361	10.3	53.3	0.5	7.9	13	98.7	65
362	9.9	49.8	0.7	7.7	13	98.7	65
363	8.6	51.1	0.7	6.6	13	98.7	65
364	9.4	48.8	0.7	7.3	13	98.7	65
365	10.3	51.4	0.7	7.9	13	98.7	65
366	12.6	50.4	0.7	9.8	13	98.7	65
367	12.9	50.6	0.6	10.0	13	98.7	65
368	12.4	52.2	0.6	9.6	13	98.7	65
369	10.6	50.5	0.5	8.2	13	98.7	65
370	9.6	50.1	0.6	7.4	13	98.7	65
371	10.7	49.0	0.7	8.2	13	98.7	65
372	12.3	49.6	0.7	9.5	13	98.7	65
373	9.8	52.0	0.7	7.6	13	98.7	65
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***Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (-C)	Pressure (kPa)	Relative Humidity (%)
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End of Report