Environmental &
Safety Professionals

ENVIRONMENTAL NOISE MONITORING
QUARTER 4, 2017

Northparkes Mines
PO Box 995
Parkes NSW 2870

Job No: J37589
Report issued: 8 January 2018

ESP – ENVIRONMENTAL & SAFETY PROFESSIONALS

A division of Enviro-Net Australia Pty. Ltd.
ABN 39 067 499 389 ACN 067 499 389 NATA Reg. 3110

Unit 2, 2B Parker St
Footscray, VIC 3011
Ph: (03 9688 8000
Fax: (03) 9689 6470
Email: esp@esplabs.com.au

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This report relates to specific conditions existing at the time of undertaking the work. Current or future conditions of the areas reviewed may not be able to be assumed or inferred from information contained in this report.

REVISION HISTORY

Revision	Revision Description	Issued	Recipient
1	*Final version*	*6/11/2017*	*N. Jones*

EXECUTIVE SUMMARY

ESP – Environmental and Safety Professionals (ESP) – was commissioned by Northparkes Mines (NPM) to undertake Environmental Noise Assessments at four residential/farming properties (Hubberstone, Lone Pine, Milpose and Hillview) in the vicinity of the NPM mine site. Monitoring was conducted to assess noise levels, resulting from NPM operations, at four key receivers around the site.

Attended noise monitoring was undertaken from the 6th to the 8th of December 2017 and unattended noise monitoring was undertaken from the 5th to the 12th of December 2017.

Weather conditions overall were not favourable for noise monitoring; however, measurements indicate compliance at all locations during conforming conditions.

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1. INTRODUCTION

ESP was commissioned by Northparkes Mines (NPM) to undertake an Environmental Noise Assessment during Quarter 4, 2017 as part of their regular noise monitoring program in accordance with Project Approval 11_0060.

This report presents:

- results of attended measurements from day, evening and night operation of the mine for the period from the 6th to the 8th of December 2017;
- results of unattended measurements from the 5th to the 12th of December 2017 and;
- an assessment of the results against Project Approval 11_0060 (DC 06-0026) requirements and the criteria described in Northparkes Mine Step Change Project Approval.

2. BACKGROUND

The NPM site is located approximately 27 kilometres NNW of the town of Parkes, NSW.

ESP was asked to conduct attended and unattended monitoring at four locations as per the following table.

Location name	Type
Hillview	Residential & farming
Hubberstone	Residential & farming
Milpose	Residential & farming
Lone Pine	Residential & farming

Table 1: Monitoring location and type

A map showing monitoring locations in relation to the mine site is presented in Appendix A of this report.

3. NOISE LIMITS

Noise Management Plan

NPM has implemented a Noise and Vibration Management Plan (NVMP) which requires noise to be monitored at key locations adjacent to the mine site.

The NVMP requires that attended noise monitoring be conducted once per quarter for three consecutive 15-minute periods at each monitoring location for each of the day, evening and night time periods. In addition, unattended noise monitoring must be conducted continuously for seven days per quarter.

Project Specific Criteria

According to PA 11_0060and the Northparkes Mine Step Change Project Approval, the project specific criteria at each location are as follows:

Period		Project Specific Criteria dB*	
Day	0700 - 1800	$L_{Aeq(15min)}$	35
Evening	1800 – 2200	$L_{Aeq(15min)}$	35
Night	2200 – 0700	$L_{Aeq(15min)}$	35
		$L_{A1(1min)}$	45

Table 2: Project specific criteria for day, evening & night periods.

* Note: All noise measurements are "A-weighted" sound pressure level measurements, hence, the notation "dB" has been used in this report without the additional qualifier "(A)" for purposes of brevity and readability.

4. NOISE LEVEL MEASUREMENT

Methodology - Equipment

Attended noise measurements were carried out using a Rion Class 1 sound level meter. Unattended noise measurement results were provided by NPM.

Calibration details are attached in Appendix B.

The equipment used is listed below:

Equipment	Model	Serial Number	Calibration due
Sound level meter (SLM)	Rion NL-52	00375605	24/05/2019

Table 3: Noise monitoring equipment details

Measurements were conducted in accordance with AS1055.1-1997 *Acoustics - Description and measurement of environmental noise - General procedures*.

Methodology – Meteorological Conditions

The noise limits in PA 11_0060 apply only in wind speeds up to 3m/s. Meteorological data from NPM's weather station, corresponding with the entire monitoring period, is attached in Appendix C.

It is noted that noise limits apply during relatively calm conditions (wind speeds up to 3 m/s equates to 10.8 km/h). Where wind speeds have exceeded this limit, measurements are marked as being not applicable using "NA". Comparison with the documented limit should only be made when measurement of wind speed conforms to the maximum allowable wind speed.

Observations

The noise output from the mine site was found to be continuous. No adjustments were required to the measured noise level for intermittent, tonal or impulsive characteristics. Additionally, the measurement points were chosen so that no adjustment was required for reflection or indoor measurement.

It is noted that at various times during attended monitoring, extraneous noise sources, i.e. sources other than the mine, were the primary contributor to measured noise levels. Commonly, these noise sources include wildlife (e.g. birds, frogs and insects), livestock (e.g. sheep and cattle), road traffic, overhead aircraft, farm machinery and vegetation noise (i.e. rustling of foliage). Where possible, extraneous noise was excluded from the result either by pausing the sound level meter until the extraneous noise event had ceased (such as for traffic or aircraft noise) or by removing the extraneous noise via frequency analysis – i.e. subtracting the contribution to the overall sound pressure level at key frequencies not related to noise emissions from NPM. Adjusting via frequency analysis is not possible with LA1 results.

Frequency analysis can only be utilised at frequencies where there is no overlap between the frequencies of NPM noise and extraneous noise. Peaks in the frequency spectrum of received noise are present but not caused by NPM noise (e.g. insect, frog and bird noise) at frequencies of approximately 2 kHz and above.

Attended Noise Monitoring Results

Measurements conducted during excessive winds do not conform to the maximum wind speed requirements of PA11_0060 and are not to be compared against the criteria. These levels are marked with the notation "NA" in the tables overleaf. Where noise levels have been adjusted due to the presence of extraneous noise such as insect or bird noise, these levels are marked with the notation "adj.".

Location	Date and Time	L_{A1} dB	L_{A10} dB	L_{Aeq} dB	L_{A90} dB	Compliance?	Notes
Hillview	6/12/2017 17:15	41	37	**32**	29	Yes (adj.)	Bird noise necessitating adjustment Wind noise Wind gusting to 4 m/s Mine inaudible
	6/12/2017 17:30	44	40	**38**	38	NA	
	6/12/2017 17:45	47	41	**38**	38	NA	
Hubberstone	6/12/2017 14:22	43	38	**35**	30	Yes	Bird noise Wind noise Mine inaudible
	6/12/2017 14:37	41	38	**35**	31	Yes	
	6/12/2017 14:49	40	34	**32**	27	Yes	
Milpose	6/12/2017 16:05	42	36	**35**	29	Yes	Bird noise Wind noise Wind gusting to 3.5 m/s Mine inaudible
	6/12/2017 16:23	47	40	**37**	32	NA	
	6/12/2017 16:38	40	37	**35**	33	Yes	
Lonepine	6/12/2017 13:26	46	40	**33**	32	Yes (adj.)	Bird noise necessitating adjustment Wind noise Wind gusting to 3.5 m/s Mine inaudible
	6/12/2017 13:38	42	40	**31**	30	Yes (adj.)	
	6/12/2017 13:47	42	40	**37**	30	NA	

Table 4: Daytime Attended Noise Results

Location	Date and Time	L_{A1} dB	L_{A10} dB	L_{Aeq} dB	L_{A90} dB	Compliance?	Notes
Hillview	6/12/2017 19:20	45	36	**34**	27	Yes	
	6/12/2017 19:37	42	36	**33**	27	Yes	Bird noise Mine inaudible
	6/12/2017 19:52	44	37	**34**	27	Yes	
Hubberstone	6/12/2017 18:21	44	38	**30**	30	Yes (adj.)	
	6/12/2017 18:36	40	35	**33**	30	Yes	Bird noise necessitating adjustment Wind noise Mine inaudible
	6/12/2017 18:50	40	36	**34**	31	Yes	
Milpose	7/12/2017 19.32	52	50	**29**	44	Yes (adj.)	
	7/12/2017 19:49	53	52	**29**	45	Yes (adj.)	Insect noise necessitating adjustment Sheep noise Wind noise Mine barely audible
	7/12/2017 20:05	53	53	**29**	49	Yes (adj.)	
Lonepine	7/12/2017 21:24	55	55	**32**	46	Yes (adj.)	
	7/12/2017 21:39	55	53	**31**	45	Yes (adj.)	Insect noise necessitating adjustment Wind noise Mine inaudible
	7/12/2017 21:50	51	48	**34**	45	Yes (adj.)	

Table 5: Evening Attended Noise Results

Location	Date and Time	L_{A1} dB	L_{A10} dB	L_{Aeq} dB	L_{A90} dB	Compliance?	Notes
Hillview	-	**-**	-	**-**	-	NA	
	-	**-**	-	**-**	-	NA	Wind gusts producing noise in excess of 60dB
	-	**-**	-	**-**	-	NA	
Hubberstone	-	**-**	-	**-**	-	NA	
	-	**-**	-	**-**	-	NA	Wind gusts producing noise in excess of 60dB
	-	**-**	-	**-**	-	NA	
Milpose	-	**-**	-	**-**	-	NA	
	-	**-**	-	**-**	-	NA	Wind gusts producing noise in excess of 60dB
	-	**-**	-	**-**	-	NA	
Lonepine	7/12/2017 22:15	**56**	50	**48**	43	NA	
	7/12/2017 22:32	**52**	50	**48**	45	NA	Insect noise Frog noise Loud wind noise
	7/12/2017 22:48	**53**	48	**41**	44	NA	

Table 6: Night Attended Noise Results

Unattended Noise Monitoring Results

Noise levels were continuously monitored over a period of seven days from the 5th to the 12th of December. A summary, with average values tabled, is provided below and graphs of the full results are attached in Appendix D. These summarised levels include extraneous noise which cannot be excluded from the continuous monitoring conducted; the results do not include measurements where the wind speed exceeded three meters per second. Note: data from Hubberstone was not available due to equipment maintenance.

Location	$L_{Aeq\ (15min)}$			$L_{A1\ (1min)}$
	Day	Evening	Night	Night
Hillview	42	39	32	32
Lone Pine	47	49	43	43
Milpose	43	53	51	51

Table 7: Summary of Unattended Noise Monitoring, 5/12/17 – 12/12/17

5. DISCUSSION

Attended Noise Monitoring

Measurements indicate compliance with the 15-minute L_{Aeq} limitation of 35 dB at all locations during conforming conditions. This is despite noise from the mine being audible at several locations at various times.

Night monitoring was unable to be completed due to wind noise; previous monitoring indicates compliance with the night time limits at all locations.

Where possible, extraneous noise sources have been excluded from attended measurements by pausing the sound level meter when non-NPM sources predominate (e.g. passing traffic or aircraft) and/or subtracting the component of the frequency spectrum that is caused by non-NPM sources (e.g. wildlife noise, livestock noise or foliage noise). Extraneous noise sources may contribute as much as 15 to 20 dB to the overall measured noise levels.

Unattended Noise Monitoring

In accordance with Project Approval 11_0600, Appendix 5, Clause 3, *"attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent"*. Specifically, unattended monitoring is therefore *not to be used* to evaluate compliance with the Project Approval criteria.

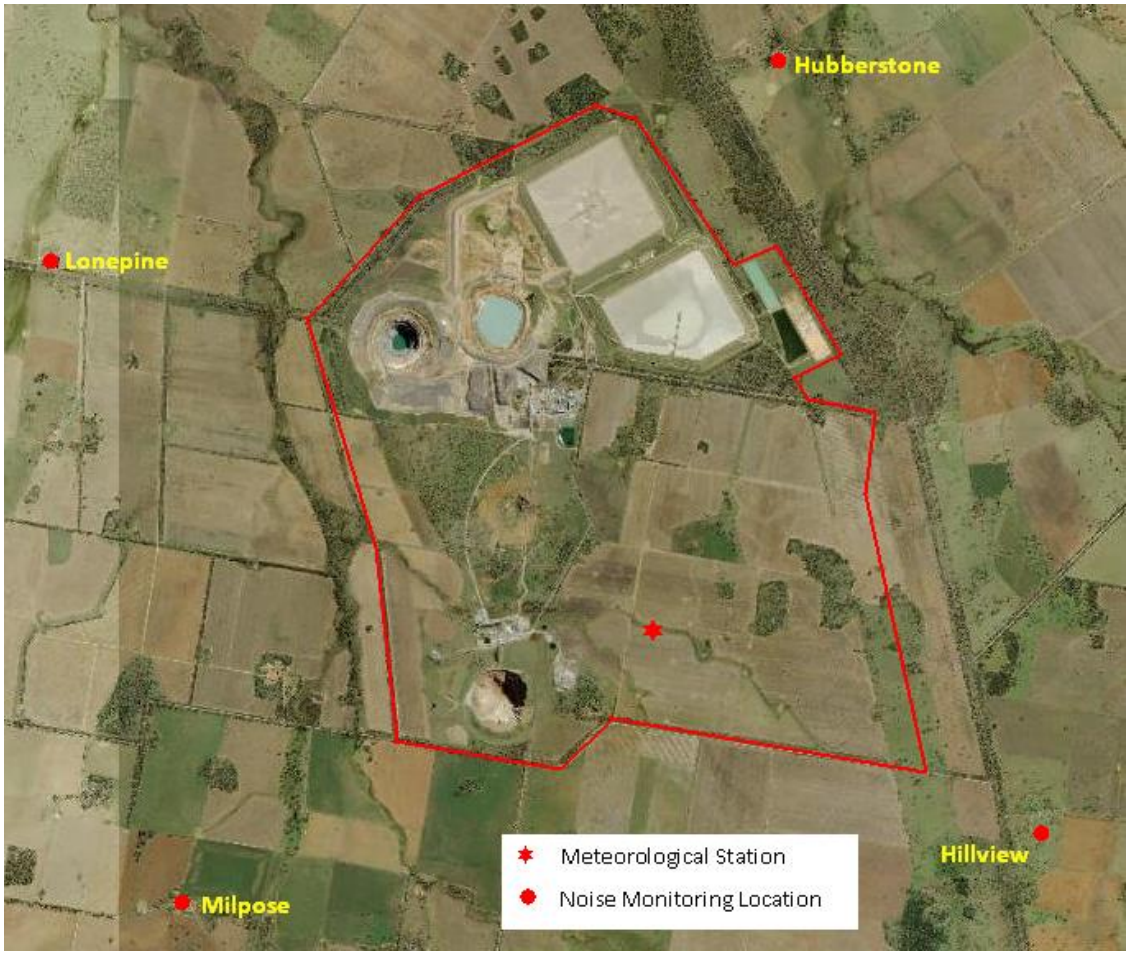
Unattended noise measurements will invariably include noise levels that cannot be directly attributed to NPM. Road traffic, farm machinery, livestock, wildlife and air traffic are some of the noise sources that contribute to noise levels logged during unattended noise monitoring. Extraneous noise sources are expected to have a higher contribution during the day and evening period. It is also noted that there is an observable correlation between wind speed and recorded noise level evident in the graphs.

6. CONCLUSION

Environmental noise monitoring was conducted at four noise sensitive receivers around the Northparkes Mine site; attended monitoring was conducted from the 6th to the 12th December 2017 and unattended monitoring was conducted from the 5th to the 12th of December 2017.

Attended noise monitoring results indicate noise emissions from the mine site comply with the development consent criteria. Weather conditions overall were not favourable for noise monitoring; however, measurements indicate compliance at all locations during conforming conditions.

Appendix A – Map of Monitoring Locations



Appendix B – Equipment Calibration Details

Acoustic Research Labs Pty Ltd
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter

IEC 61672-3.2013

Calibration Certificate

Calibration Number C17244

Client Details ESP Environmental & Safety Professionals
Unit 2, 2B Parker Street
FOOTSCRAY VIC 3011

Equipment Tested/ Model Number : Rion NL-52EX
Instrument Serial Number : 00375605
Microphone Serial Number : 11074
Pre-amplifier Serial Number : 65732

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	22.1°C	**Ambient Temperature :**	22.2°C
Relative Humidity :	53.1%	**Relative Humidity :**	53.1%
Barometric Pressure :	99.31kPa	**Barometric Pressure :**	99.29kPa

Calibration Technician : Vicky Jaiswal
Calibration Date : 24/05/2017
Secondary Check: Sandra Minto
Report Issue Date : 24/05/2017

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
31.5 Hz to 8kHz	*±0.16dB*	*Temperature*	*±0.05°C*
12.5kHz	*±0.2dB*	*Relative Humidity*	*±0.46%*
16kHz	*±0.29dB*	*Barometric Pressure*	*±0.017kPa*
Electrical Tests			
31.5 Hz to 20 kHz	*±0.12dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Acoustic Research Labs Pty Ltd
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Octave Band Filter
AS 4476:1997
Calibration Certificate

Calibration Number C17244A

Client Details ESP Environmental & Safety Professionals
Unit 2, 2B Parker Street
FOOTSCRAY VIC 3011

Filter Model Number : Rion NL-52EX
Filter Serial Number : N/A
Instrument Serial Number : 00375605
Microphone Serial Number : 11074
Pre-amplifier Serial Number : 65732

Atmospheric Conditions
Ambient Temperature : 21.8°C
Relative Humidity : 49.1%
Barometric Pressure : 99.27kPa

Calibration Technician : Vicky Jaiswal
Calibration Date : 24/05/2017
Secondary Check: Sandra Minto
Report Issue Date : 24/05/2017

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
4.4 & 5.3: 1/1 Octave relative attenuation	*Pass*	4.6 & 5.5: Linear operating range	*Pass*
4.4 & 5.3: 1/3 Octave relative attenuation	*Pass*	4.8 & 5.7: Anti-alias filters	*Pass*
		4.10 & 5.9: Flat frequency response	*Pass*

The fractional octave band meter under test has been shown to conform to the class 1 requirements for periodic testing as described in AS 4476:1997 for the tests stated above.

Least Uncertainties of Measurement -

Electrical Tests		Environmental Conditions	
< 16Hz	*±0.19dB*	*Temperature*	*±0.05°C*
16Hz-100Hz	*±0.11dB*	*Relative Humidity*	*±0.46%*
100Hz-1000Hz	*±0.09dB*	*Barometric Pressure*	*±0.017kPa*
1000Hz-10kHz	*±0.09dB*		
>10kHz	*±0.16dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

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Appendix C – Weather Conditions during Monitoring Period

Note: Data provided by Northparkes Mine.

Wind-Rose

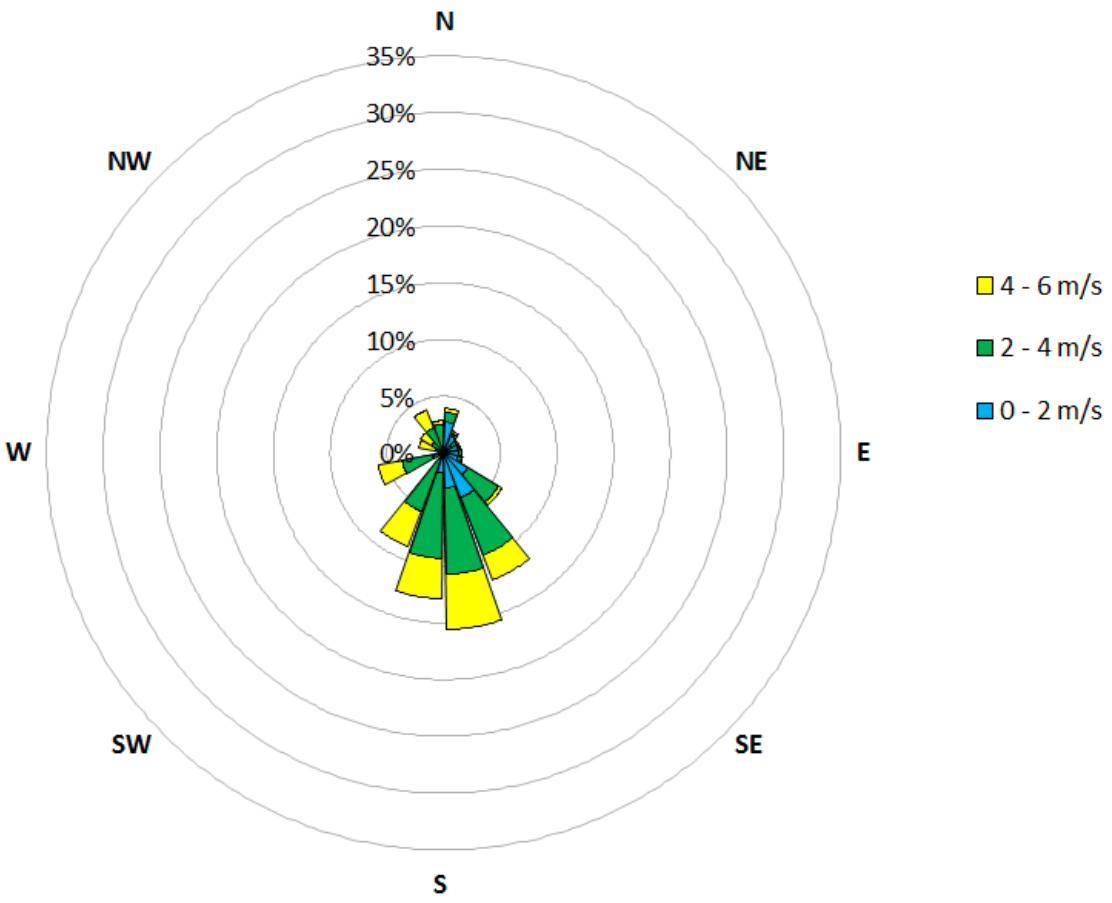


Figure 1 - Wind rose for period 5/12/17 – 12/12/17

Tabulated Meteorological Conditions

Date & time	Wind speed (m/s)	Wind Direction (°)
5/12/2017 8:30	1.967	151.3
5/12/2017 8:40	1.527	167.1
5/12/2017 8:50	1.552	196.7
5/12/2017 9:00	1.815	207.1
5/12/2017 9:10	1.551	261.7
5/12/2017 9:20	1.661	214.3
5/12/2017 9:30	2.156	219.1
5/12/2017 9:40	2.521	238.5
5/12/2017 9:50	2.824	215.6
5/12/2017 10:10	2.738	227.6
5/12/2017 10:20	4.904	252.4
5/12/2017 10:30	3.2	243.8
5/12/2017 10:50	4.36	246.2
5/12/2017 11:10	4.433	254.2
5/12/2017 11:20	4.278	218.9
5/12/2017 11:30	6.363	246.8
5/12/2017 11:40	3.993	245.2
5/12/2017 11:50	4.447	204.4
5/12/2017 12:00	3.697	224.8
5/12/2017 12:10	4.621	232.5
5/12/2017 12:20	3.192	241.9
5/12/2017 12:40	3.2	221.5
5/12/2017 12:50	3.144	238.5
5/12/2017 13:00	3.478	270.1
5/12/2017 13:10	2.096	258.3
5/12/2017 13:20	3.466	240.3
5/12/2017 13:30	4.211	295.5
5/12/2017 13:40	4.246	275.9
5/12/2017 13:50	2.555	278.4
5/12/2017 14:00	3.754	241.6
5/12/2017 14:10	4.071	251.6
5/12/2017 14:20	4.259	276.2
5/12/2017 14:30	3.068	255.5
5/12/2017 14:40	4.531	263.3
5/12/2017 14:50	3.651	274.4
5/12/2017 15:00	5.406	264.8
5/12/2017 15:10	2.859	175.8
5/12/2017 15:20	3.134	192.2
5/12/2017 15:30	4.19	242.9
5/12/2017 15:40	8.71	228.3
5/12/2017 15:50	8.96	224.6
5/12/2017 16:00	7.512	217.5
5/12/2017 16:10	7.433	207.4
5/12/2017 16:20	6.995	192.5
5/12/2017 16:30	6.209	196.4
5/12/2017 16:40	6.253	208.3
5/12/2017 16:50	6.339	196.5
5/12/2017 17:00	6.787	200.7

Date & time	Wind speed (m/s)	Wind Direction (°)
5/12/2017 17:10	5.907	194.2
5/12/2017 17:20	6.365	192.1
5/12/2017 17:30	5.275	199.7
5/12/2017 17:40	8.03	167.8
5/12/2017 17:50	7.764	157.1
5/12/2017 18:00	7.185	158.1
5/12/2017 18:10	6.788	161.4
5/12/2017 18:20	5.911	177.3
5/12/2017 18:30	5.026	192.8
5/12/2017 18:40	4.79	185.5
5/12/2017 18:50	5.739	168.3
5/12/2017 19:00	5.56	166.4
5/12/2017 19:10	5.263	161.8
5/12/2017 19:20	5.104	168
5/12/2017 19:30	4.287	190.5
5/12/2017 19:40	3.939	186.8
5/12/2017 19:50	4.028	187.2
5/12/2017 20:00	3.675	189.6
5/12/2017 20:10	3.268	192.5
5/12/2017 20:20	3.173	177.1
5/12/2017 20:30	2.687	186.8
5/12/2017 20:40	2.186	183.1
5/12/2017 20:50	2.955	188.9
5/12/2017 21:00	2.972	183.1
5/12/2017 21:10	3.61	174.9
5/12/2017 21:20	3.491	170
5/12/2017 21:30	3.538	168.1
5/12/2017 21:40	3.203	175
5/12/2017 21:50	2.837	181.6
5/12/2017 22:00	2.984	169.4
5/12/2017 22:10	2.058	183.1
5/12/2017 22:20	2.098	189.6
5/12/2017 22:30	2.398	175.8
5/12/2017 22:40	2.656	191.2
5/12/2017 22:50	2.706	192.9
5/12/2017 23:00	2.839	200.1
5/12/2017 23:10	3.261	204.3
5/12/2017 23:20	3.447	196.5
5/12/2017 23:30	3.261	202.1
5/12/2017 23:40	3.156	201.4
5/12/2017 23:50	2.573	212
6/12/2017 0:00	2.351	199.5
6/12/2017 0:10	2.386	216.6
6/12/2017 0:20	2.764	210.1
6/12/2017 0:30	2.37	208.7
6/12/2017 0:40	2.317	190.1
6/12/2017 0:50	2.095	194.9
6/12/2017 1:00	2.92	222.3

Date & time	Wind speed (m/s)	Wind Direction (°)
6/12/2017 1:10	2.678	222.1
6/12/2017 1:20	2.834	210.7
6/12/2017 1:30	2.469	202.8
6/12/2017 1:40	2.696	202.1
6/12/2017 1:50	2.696	217.1
6/12/2017 2:00	2.818	217
6/12/2017 2:10	3.106	201.9
6/12/2017 2:20	2.947	203.2
6/12/2017 2:30	3.323	204.9
6/12/2017 2:40	3.387	195.1
6/12/2017 2:50	3.215	195.6
6/12/2017 3:00	3.213	187.6
6/12/2017 3:10	3.214	185.6
6/12/2017 3:20	2.565	177.7
6/12/2017 3:30	2.126	176
6/12/2017 3:40	1.916	168.1
6/12/2017 3:50	1.944	175.1
6/12/2017 4:00	1.994	167
6/12/2017 4:10	1.647	171.8
6/12/2017 4:20	1.678	205
6/12/2017 4:30	2.314	191.2
6/12/2017 4:40	1.77	169.9
6/12/2017 4:50	1.375	184.4
6/12/2017 5:00	1.423	182.9
6/12/2017 5:10	1.92	154.2
6/12/2017 5:20	1.693	161.2
6/12/2017 5:30	2.431	182.3
6/12/2017 5:40	2.177	199.6
6/12/2017 5:50	2.278	212.8
6/12/2017 6:00	2.527	193
6/12/2017 6:10	2.862	187.7
6/12/2017 6:20	3.239	183.4
6/12/2017 6:30	3.69	160.3
6/12/2017 6:40	4.05	161.1
6/12/2017 6:50	3.856	148
6/12/2017 7:00	3.532	148.5
6/12/2017 7:10	2.676	156.3
6/12/2017 7:20	2.613	145.3
6/12/2017 7:30	3.213	163.3
6/12/2017 7:40	2.928	180.4
6/12/2017 7:50	2.607	183.4
6/12/2017 8:00	2.416	189.8
6/12/2017 8:10	2.455	142.3
6/12/2017 8:20	1.787	242.8
6/12/2017 8:30	1.726	173.3
6/12/2017 8:40	1.692	265.6
6/12/2017 8:50	2.436	250.4
6/12/2017 9:10	2.309	233.6
6/12/2017 9:20	1.931	219.6
6/12/2017 9:40	1.716	106.8
6/12/2017 9:50	1.735	134.6

Date & time	Wind speed (m/s)	Wind Direction (°)
6/12/2017 10:10	1.736	254.8
6/12/2017 10:20	3.021	180.1
6/12/2017 10:30	2.012	222.1
6/12/2017 10:40	3.545	209
6/12/2017 10:50	3.427	239.1
6/12/2017 11:00	4.218	206
6/12/2017 11:20	4.781	205.4
6/12/2017 11:40	4.719	192.2
6/12/2017 11:50	4.812	186.7
6/12/2017 12:00	5.784	209.9
6/12/2017 12:20	4.325	219.9
6/12/2017 12:30	5.023	230.3
6/12/2017 12:50	4.521	225.2
6/12/2017 13:00	5.316	239.4
6/12/2017 13:10	4.978	248.9
6/12/2017 13:20	4.389	254.9
6/12/2017 13:30	5.276	266.4
6/12/2017 13:40	5.458	252.3
6/12/2017 13:50	4.69	249.1
6/12/2017 14:00	4.179	252.2
6/12/2017 14:10	4.377	242
6/12/2017 14:20	3.574	261.1
6/12/2017 14:30	3.222	251.1
6/12/2017 14:40	4.003	256.2
6/12/2017 14:50	4.192	239.6
6/12/2017 15:00	4.26	232.9
6/12/2017 15:10	4.712	191.6
6/12/2017 15:20	3.802	211.2
6/12/2017 15:30	3.394	213.5
6/12/2017 15:40	4.699	197.7
6/12/2017 15:50	4.927	206.1
6/12/2017 16:00	4.104	210.5
6/12/2017 16:10	3.785	232.5
6/12/2017 16:20	3.619	204
6/12/2017 16:30	4.197	199.5
6/12/2017 16:40	4.495	226.5
6/12/2017 16:50	4.906	214.2
6/12/2017 17:00	4.846	238.1
6/12/2017 17:10	4.41	243.9
6/12/2017 17:20	4.553	258.9
6/12/2017 17:30	4.146	253.8
6/12/2017 17:40	3.876	261.6
6/12/2017 17:50	3.326	252.9
6/12/2017 18:00	2.657	258
6/12/2017 18:10	2.203	256.6
6/12/2017 18:20	2.14	254.6
6/12/2017 18:30	2.125	255
6/12/2017 18:40	1.384	254.1
6/12/2017 18:50	0.763	245.4
6/12/2017 19:00	0.33	256.6
6/12/2017 19:10	0	258.2

Date & time	Wind speed (m/s)	Wind Direction (°)
6/12/2017 19:20	0.001	302.6
6/12/2017 19:30	0.948	334.8
6/12/2017 19:40	1.969	2.071
6/12/2017 19:50	1.766	1.832
6/12/2017 20:00	1.226	1.559
6/12/2017 20:10	1.303	358.6
6/12/2017 20:20	1.781	340.9
6/12/2017 20:30	2.372	337.9
6/12/2017 20:40	2.125	349.9
6/12/2017 20:50	0.485	17.24
6/12/2017 21:00	0.534	68.83
6/12/2017 21:10	0.881	68.53
6/12/2017 21:20	0.65	45.98
6/12/2017 21:30	1.063	7.883
6/12/2017 21:40	1.225	358.9
6/12/2017 21:50	1.114	13.25
6/12/2017 22:00	0.952	32.27
6/12/2017 22:10	1.237	41.13
6/12/2017 22:20	1	25.83
6/12/2017 22:30	0.846	11.75
6/12/2017 22:40	1.293	8.46
6/12/2017 22:50	1.446	21.71
6/12/2017 23:00	1.487	39.69
6/12/2017 23:10	0.803	39.46
6/12/2017 23:20	1.065	16.17
6/12/2017 23:30	0.874	33.75
6/12/2017 23:40	0.711	35.69
6/12/2017 23:50	2.119	13.88
7/12/2017 0:00	1.817	11.13
7/12/2017 0:10	2.063	2.692
7/12/2017 0:20	1.795	4.364
7/12/2017 0:30	1.768	10.17
7/12/2017 0:40	1.597	14.6
7/12/2017 0:50	1.463	7.898
7/12/2017 1:00	1.144	11.62
7/12/2017 1:10	0.981	16.21
7/12/2017 1:20	1.137	16.48
7/12/2017 1:30	1.149	13.2
7/12/2017 1:40	1.178	10.21
7/12/2017 1:50	1.118	24.47
7/12/2017 2:00	1.105	22.71
7/12/2017 2:10	0.835	11.94
7/12/2017 2:20	1.298	15.68
7/12/2017 2:30	1.484	23.98
7/12/2017 2:40	1.44	25.44
7/12/2017 2:50	1.419	22.69
7/12/2017 3:00	1.187	11.87
7/12/2017 3:10	1.022	8.73
7/12/2017 3:20	1.166	4.135
7/12/2017 3:30	0.888	18.05
7/12/2017 3:40	1.053	23.66

Date & time	Wind speed (m/s)	Wind Direction (°)
7/12/2017 3:50	0.953	13.61
7/12/2017 4:00	1.418	4.17
7/12/2017 4:10	1.173	9.21
7/12/2017 4:20	1.29	9.65
7/12/2017 4:30	2.401	4.726
7/12/2017 4:40	1.525	10.52
7/12/2017 4:50	0.823	26.12
7/12/2017 5:00	1.13	6.39
7/12/2017 5:10	0.924	23.85
7/12/2017 5:20	1.156	23.58
7/12/2017 5:30	1.339	17.65
7/12/2017 5:40	1.01	12
7/12/2017 5:50	0.459	8.55
7/12/2017 6:00	0.382	358.2
7/12/2017 6:10	1.482	355.9
7/12/2017 6:20	2.044	357.7
7/12/2017 6:30	2.053	358
7/12/2017 6:40	2.468	351.8
7/12/2017 6:50	2.63	344.7
7/12/2017 7:00	2.819	342.5
7/12/2017 7:10	3.162	343.4
7/12/2017 7:20	3.423	351.9
7/12/2017 7:30	3.677	342.5
7/12/2017 7:40	3.032	344.3
7/12/2017 7:50	2.904	338
7/12/2017 8:00	3.043	343
7/12/2017 8:10	2.807	341.9
7/12/2017 8:20	2.81	342.6
7/12/2017 8:30	2.659	343.2
7/12/2017 8:40	2.735	340.7
7/12/2017 8:50	2.941	329.2
7/12/2017 9:00	3.263	322.5
7/12/2017 9:10	3.548	318.3
7/12/2017 9:20	3.964	324.3
7/12/2017 9:30	3.708	330.3
7/12/2017 9:40	4.914	314.1
7/12/2017 9:50	4.536	308
7/12/2017 10:00	5.238	292.8
7/12/2017 10:10	5.271	285.1
7/12/2017 10:20	4.676	292.8
7/12/2017 10:40	5.213	284
7/12/2017 10:50	5.834	292.4
7/12/2017 11:00	4.65	291.2
7/12/2017 11:10	5.225	328.6
7/12/2017 11:20	5.858	311.6
7/12/2017 11:30	4.892	297.3
7/12/2017 11:40	4.599	285.5
7/12/2017 11:50	3.93	300.1
7/12/2017 12:00	5.816	320.9
7/12/2017 12:10	5.829	325.5
7/12/2017 12:20	6.852	322.6

Date & time	Wind speed (m/s)	Wind Direction (°)
7/12/2017 12:30	5.035	310.3
7/12/2017 12:40	5.841	320.6
7/12/2017 12:50	5.082	307.8
7/12/2017 13:00	4.247	290.3
7/12/2017 13:10	3.489	268
7/12/2017 13:20	5.888	277.9
7/12/2017 13:30	5.547	268.9
7/12/2017 13:40	5.512	266.3
7/12/2017 13:50	4.627	281.5
7/12/2017 14:00	6.109	288.7
7/12/2017 14:10	4.813	266.1
7/12/2017 14:20	6.187	278.5
7/12/2017 14:30	5.124	280.3
7/12/2017 14:40	6.198	270.5
7/12/2017 14:50	5.465	311
7/12/2017 15:00	5.479	287.1
7/12/2017 15:10	5.367	296.6
7/12/2017 15:20	5.534	290.4
7/12/2017 15:30	6.381	305.5
7/12/2017 15:40	5.216	288.1
7/12/2017 15:50	4.381	307.1
7/12/2017 16:00	5.14	286.7
7/12/2017 16:10	4.734	301.6
7/12/2017 16:20	5.794	322.9
7/12/2017 16:30	5.02	296.2
7/12/2017 16:40	5.527	298
7/12/2017 16:50	5.696	317.5
7/12/2017 17:00	4.906	324
7/12/2017 17:10	4.602	293.9
7/12/2017 17:20	5.252	289.9
7/12/2017 17:30	5.103	307
7/12/2017 17:40	5.418	309
7/12/2017 17:50	4.985	307.3
7/12/2017 18:00	4.793	325.4
7/12/2017 18:10	4.383	324.5
7/12/2017 18:20	3.931	324.3
7/12/2017 18:30	4.196	323.7
7/12/2017 18:40	3.923	325.1
7/12/2017 18:50	3.71	322.8
7/12/2017 19:00	3.464	318.7
7/12/2017 19:10	2.857	323.1
7/12/2017 19:20	2.645	326.1
7/12/2017 19:30	6.591	274.4
7/12/2017 19:40	8.55	191.6
7/12/2017 19:50	6.719	195
7/12/2017 20:00	7.767	206.1
7/12/2017 20:10	7.784	190.5
7/12/2017 20:20	7.207	170.8
7/12/2017 20:30	6.056	158.4
7/12/2017 20:40	5.452	156.1
7/12/2017 20:50	5.293	145.1

Date & time	Wind speed (m/s)	Wind Direction (°)
7/12/2017 21:00	4.482	140.6
7/12/2017 21:10	4.406	155.2
7/12/2017 21:20	4.783	167
7/12/2017 21:30	2.478	179
7/12/2017 21:40	3.577	184.7
7/12/2017 21:50	4.971	171
7/12/2017 22:00	6.836	177.6
7/12/2017 22:10	8.29	174.1
7/12/2017 22:20	6.656	173.2
7/12/2017 22:30	6.52	174.8
7/12/2017 22:40	5.862	165.7
7/12/2017 22:50	5.403	177
7/12/2017 23:00	6.074	193.5
7/12/2017 23:10	8.19	178.5
7/12/2017 23:20	7.053	175.4
7/12/2017 23:30	6.778	167.8
7/12/2017 23:40	6.547	151.7
7/12/2017 23:50	5.207	138.7
8/12/2017 0:00	4.792	181.5
8/12/2017 0:10	4.514	170
8/12/2017 0:20	4.625	144
8/12/2017 0:30	4.631	138.4
8/12/2017 0:40	4.668	129.3
8/12/2017 0:50	4.994	115.1
8/12/2017 1:00	3.372	136.5
8/12/2017 1:10	3.628	148.5
8/12/2017 1:20	3.856	163.6
8/12/2017 1:30	4.361	167.5
8/12/2017 1:40	2.637	153.9
8/12/2017 1:50	2.47	152.3
8/12/2017 2:00	3.122	198.1
8/12/2017 2:10	3.027	133.8
8/12/2017 2:20	2.357	137.6
8/12/2017 2:30	3.231	161.3
8/12/2017 2:40	2.82	159.8
8/12/2017 2:50	2.843	138.3
8/12/2017 3:00	2.551	129.3
8/12/2017 3:10	1.982	131.7
8/12/2017 3:20	1.681	31.76
8/12/2017 3:30	1.887	185.8
8/12/2017 3:40	2.708	181.1
8/12/2017 3:50	2.341	194.7
8/12/2017 4:00	1.912	193.6
8/12/2017 4:10	1.345	198.1
8/12/2017 4:20	1.204	90.9
8/12/2017 4:30	1.835	189.2
8/12/2017 4:40	3.356	199
8/12/2017 4:50	3.183	200.2
8/12/2017 5:00	3.974	203.7
8/12/2017 5:10	3.397	191
8/12/2017 5:20	3.814	192.6

Date & time	Wind speed (m/s)	Wind Direction (°)
8/12/2017 5:30	3.92	199.1
8/12/2017 5:40	3.475	198.1
8/12/2017 5:50	3.342	197.8
8/12/2017 6:00	3.681	191.8
8/12/2017 6:10	4.603	182.8
8/12/2017 6:20	4.377	191.2
8/12/2017 6:30	4.57	197.8
8/12/2017 6:40	4.293	195.4
8/12/2017 6:50	4.472	202.2
8/12/2017 7:00	5.287	201.9
8/12/2017 7:10	5.084	194.9
8/12/2017 7:20	5.386	187.3
8/12/2017 7:30	4.89	191.8
8/12/2017 7:40	4.98	185
8/12/2017 7:50	5.556	201.5
8/12/2017 8:00	4.996	203.4
8/12/2017 8:10	4.721	199
8/12/2017 8:20	5.284	194.8
8/12/2017 8:30	4.621	177.5
8/12/2017 8:40	4.433	174
8/12/2017 8:50	3.999	179.7
8/12/2017 9:00	4.207	190.4
8/12/2017 9:10	4.333	179.9
8/12/2017 10:10	4.283	182.3
8/12/2017 10:30	5.244	165.4
8/12/2017 10:40	4.478	158.6
8/12/2017 10:50	4.13	159.8
8/12/2017 11:00	3.554	191.9
8/12/2017 11:10	3.945	180
8/12/2017 11:20	5.197	192.5
8/12/2017 11:30	5.968	164
8/12/2017 11:40	5.02	178.2
8/12/2017 12:00	6.592	174
8/12/2017 12:10	5.048	168.1
8/12/2017 12:20	5.707	151.5
8/12/2017 12:30	5.838	187.3
8/12/2017 12:40	5.771	170.9
8/12/2017 12:50	5.622	185.6
8/12/2017 13:00	5.937	172.8
8/12/2017 13:10	5.948	182
8/12/2017 13:20	5.593	183.3
8/12/2017 13:30	5.553	175.3
8/12/2017 13:40	6.213	173.6
8/12/2017 13:50	5.681	179.7
8/12/2017 14:00	5.702	184.6
8/12/2017 14:10	4.702	167.3
8/12/2017 14:20	6.196	163.2
8/12/2017 14:30	5.843	171
8/12/2017 14:40	5.907	160.1
8/12/2017 14:50	5.627	168
8/12/2017 15:00	4.359	164.3

Date & time	Wind speed (m/s)	Wind Direction (°)
8/12/2017 15:10	6.199	163.8
8/12/2017 15:20	5.075	173.7
8/12/2017 15:30	5.006	188.7
8/12/2017 15:40	5.315	190.2
8/12/2017 15:50	4.75	180.1
8/12/2017 16:00	4.685	171.1
8/12/2017 16:10	4.936	180.2
8/12/2017 16:20	6.286	192.5
8/12/2017 16:30	5.732	175.4
8/12/2017 16:40	5.661	175.5
8/12/2017 16:50	5.866	175.4
8/12/2017 17:00	5.383	177.3
8/12/2017 17:10	5.441	173.2
8/12/2017 17:20	5.146	172.4
8/12/2017 17:30	5.593	174.6
8/12/2017 17:40	6.014	172.5
8/12/2017 17:50	5.721	163.8
8/12/2017 18:00	5.472	166.2
8/12/2017 18:10	5.824	168.5
8/12/2017 18:20	4.741	170.3
8/12/2017 18:30	4.403	172.8
8/12/2017 18:40	5.073	176.1
8/12/2017 18:50	5.053	170
8/12/2017 19:00	5.121	170.9
8/12/2017 19:10	4.686	176.6
8/12/2017 19:20	3.907	179.2
8/12/2017 19:30	3.887	186.7
8/12/2017 19:40	3.578	189.9
8/12/2017 19:50	2.98	188.2
8/12/2017 20:00	2.724	186.8
8/12/2017 20:10	2.779	181
8/12/2017 20:20	3.164	178.9
8/12/2017 20:30	3.312	179.6
8/12/2017 20:40	3.466	177.5
8/12/2017 20:50	3.331	177.1
8/12/2017 21:00	2.783	176.4
8/12/2017 21:10	2.711	175.1
8/12/2017 21:20	2.857	171.5
8/12/2017 21:30	2.862	172
8/12/2017 21:40	2.405	161.9
8/12/2017 21:50	1.979	164.8
8/12/2017 22:00	2.005	155.1
8/12/2017 22:10	1.631	142
8/12/2017 22:20	1.482	155.1
8/12/2017 22:30	1.632	175.8
8/12/2017 22:40	1.837	187
8/12/2017 22:50	1.831	158.2
8/12/2017 23:00	1.666	151.5
8/12/2017 23:10	1.827	177.4
8/12/2017 23:20	2.032	175.4
8/12/2017 23:30	1.955	175

Date & time	Wind speed (m/s)	Wind Direction (°)
8/12/2017 23:40	2.106	185.9
8/12/2017 23:50	2.156	187.2
9/12/2017 0:00	2.387	180.2
9/12/2017 0:10	2.478	177.9
9/12/2017 0:20	2.109	168.4
9/12/2017 0:30	2.38	175.5
9/12/2017 0:40	2.789	177.6
9/12/2017 0:50	2.717	172.6
9/12/2017 1:00	2.38	168.8
9/12/2017 1:10	1.696	133.7
9/12/2017 1:20	2.427	167.5
9/12/2017 1:30	2.738	155.7
9/12/2017 1:40	2.93	144.1
9/12/2017 1:50	2.872	143.7
9/12/2017 2:00	2.867	150.2
9/12/2017 2:10	2.565	152.5
9/12/2017 2:20	2.409	153.9
9/12/2017 2:30	1.936	147.6
9/12/2017 2:40	1.639	147.3
9/12/2017 2:50	1.931	166.6
9/12/2017 3:00	1.602	149.7
9/12/2017 3:10	1.869	156.2
9/12/2017 3:20	1.898	152.9
9/12/2017 3:30	1.721	151.1
9/12/2017 3:40	1.89	149
9/12/2017 3:50	1.788	153.5
9/12/2017 4:00	1.979	164.4
9/12/2017 4:10	1.867	149.5
9/12/2017 4:20	1.514	149.2
9/12/2017 4:30	1.349	173.2
9/12/2017 4:40	2.057	162.6
9/12/2017 4:50	2.115	159.7
9/12/2017 5:00	2.056	160.3
9/12/2017 5:10	1.878	152.5
9/12/2017 5:20	1.973	154.6
9/12/2017 5:30	1.911	159.7
9/12/2017 5:40	1.433	162.7
9/12/2017 5:50	1.453	164.8
9/12/2017 6:00	1.588	156
9/12/2017 6:10	1.946	161.8
9/12/2017 6:20	3.168	159.7
9/12/2017 6:30	3.763	160
9/12/2017 6:40	4.374	152.3
9/12/2017 6:50	5.329	153.9
9/12/2017 7:00	5.215	156.2
9/12/2017 7:10	5.208	155.1
9/12/2017 7:20	5.993	150.5
9/12/2017 7:30	6.79	151.4
9/12/2017 7:40	5.967	153.9
9/12/2017 7:50	7.011	149
9/12/2017 8:00	7.496	153.3

Date & time	Wind speed (m/s)	Wind Direction (°)
9/12/2017 8:10	7.473	155
9/12/2017 8:20	8.18	157.4
9/12/2017 8:30	7.455	152.1
9/12/2017 8:40	7.666	151.7
9/12/2017 8:50	6.748	160.6
9/12/2017 9:00	6.61	152.4
9/12/2017 9:10	6.282	164.2
9/12/2017 9:20	6.166	160.8
9/12/2017 9:30	5.439	157.1
9/12/2017 9:40	5.188	156.9
9/12/2017 10:00	4.329	129
9/12/2017 10:10	4.856	151.9
9/12/2017 10:30	4.765	168.5
9/12/2017 10:50	3.045	170.5
9/12/2017 11:10	3.506	156.8
9/12/2017 11:20	3.867	140.9
9/12/2017 11:30	4.837	152.2
9/12/2017 11:40	4.416	162.5
9/12/2017 11:50	4.125	198.6
9/12/2017 12:00	4.561	148.5
9/12/2017 12:10	4.967	173.7
9/12/2017 12:20	5.075	161.1
9/12/2017 12:30	5.389	169.9
9/12/2017 12:40	5.641	167.8
9/12/2017 12:50	4.722	164.6
9/12/2017 13:00	5.161	169
9/12/2017 13:10	5.983	185.4
9/12/2017 13:20	4.052	186
9/12/2017 13:30	5.944	162.5
9/12/2017 13:40	5.156	144.7
9/12/2017 13:50	5.156	172
9/12/2017 14:00	5.284	164
9/12/2017 14:10	5.439	143
9/12/2017 14:20	4.685	148.9
9/12/2017 14:30	5.641	140.5
9/12/2017 14:40	4.639	159.1
9/12/2017 14:50	5.559	155.9
9/12/2017 15:00	5.143	154.3
9/12/2017 15:10	5.363	163.7
9/12/2017 15:20	5.112	166.9
9/12/2017 15:30	5.918	182.2
9/12/2017 15:40	5.651	180.4
9/12/2017 15:50	5.664	163
9/12/2017 16:00	6.385	151.5
9/12/2017 16:10	5.44	151.5
9/12/2017 16:20	6.309	152.8
9/12/2017 16:30	6.171	167.4
9/12/2017 16:40	6.655	155.2
9/12/2017 16:50	6.169	161.1
9/12/2017 17:00	6.354	152.9
9/12/2017 17:10	6.284	145.4

Date & time	Wind speed (m/s)	Wind Direction (°)
9/12/2017 17:20	5.906	155.7
9/12/2017 17:30	5.737	161
9/12/2017 17:40	6.152	156.2
9/12/2017 17:50	6.09	167.9
9/12/2017 18:00	6.35	168.2
9/12/2017 18:10	5.932	167.1
9/12/2017 18:20	4.961	166.1
9/12/2017 18:30	4.804	160.2
9/12/2017 18:40	4.28	157.7
9/12/2017 18:50	3.881	159.6
9/12/2017 19:00	3.2	159.9
9/12/2017 19:10	3.162	161.7
9/12/2017 19:20	2.992	164.8
9/12/2017 19:30	2.675	173.3
9/12/2017 19:40	2.14	178.5
9/12/2017 19:50	1.779	176.3
9/12/2017 20:00	1.988	175.2
9/12/2017 20:10	1.799	169.5
9/12/2017 20:20	1.877	155.3
9/12/2017 20:30	1.995	139.4
9/12/2017 20:40	1.863	131.2
9/12/2017 20:50	1.316	126.8
9/12/2017 21:00	0.988	133.7
9/12/2017 21:10	1.574	139.1
9/12/2017 21:20	2.207	133
9/12/2017 21:30	2.221	136.4
9/12/2017 21:40	1.923	145.1
9/12/2017 21:50	2.485	174.3
9/12/2017 22:00	2.57	145.9
9/12/2017 22:10	2.088	161.8
9/12/2017 22:20	2.107	172.8
9/12/2017 22:30	1.184	168.1
9/12/2017 22:40	0.991	164.1
9/12/2017 22:50	2.159	170.9
9/12/2017 23:00	2.773	161.1
9/12/2017 23:10	2.343	159.8
9/12/2017 23:20	1.159	159.4
9/12/2017 23:30	0.903	151.8
9/12/2017 23:40	1.516	150.6
9/12/2017 23:50	2.273	137.9
10/12/2017 0:00	2.48	124.9
10/12/2017 0:10	2.249	117.6
10/12/2017 0:20	1.419	93.2
10/12/2017 0:30	0.774	140.1
10/12/2017 0:40	2.128	162.1
10/12/2017 0:50	2.326	144
10/12/2017 1:00	2.936	152.2
10/12/2017 1:10	2.09	154.5
10/12/2017 1:20	1.743	153.5
10/12/2017 1:30	1.728	149.2
10/12/2017 1:40	2.219	152.2

Date & time	Wind speed (m/s)	Wind Direction (°)
10/12/2017 1:50	2.918	152.4
10/12/2017 2:00	2.815	154.8
10/12/2017 2:10	2.666	159.5
10/12/2017 2:20	1.975	142
10/12/2017 2:30	1.296	143.7
10/12/2017 2:40	1.705	131.6
10/12/2017 2:50	1.535	107.3
10/12/2017 3:00	0.918	68.05
10/12/2017 3:10	0.5	71.18
10/12/2017 3:20	1.164	73.07
10/12/2017 3:30	0.839	88.6
10/12/2017 3:40	0.236	91.3
10/12/2017 3:50	0.039	88
10/12/2017 4:00	0.803	138.4
10/12/2017 4:10	1.147	147.9
10/12/2017 4:20	1.188	159.2
10/12/2017 4:30	1.356	160.2
10/12/2017 4:40	1.387	155.8
10/12/2017 4:50	0.885	158.5
10/12/2017 5:00	0.406	154.6
10/12/2017 5:10	0	0
10/12/2017 5:20	0.245	64.98
10/12/2017 5:30	0.306	30.82
10/12/2017 5:40	0.001	29.95
10/12/2017 5:50	0.058	29.75
10/12/2017 6:00	0.172	346.3
10/12/2017 6:10	0.659	223.8
10/12/2017 6:20	0.36	237.3
10/12/2017 6:30	0.012	151.7
10/12/2017 6:40	0.13	68.6
10/12/2017 6:50	0.614	69.59
10/12/2017 7:00	1.135	20.62
10/12/2017 7:10	1.576	17.29
10/12/2017 7:20	1.754	341.9
10/12/2017 7:30	2.019	336.9
10/12/2017 7:40	2.186	333.4
10/12/2017 7:50	2.56	338.8
10/12/2017 8:00	3.205	350.2
10/12/2017 8:10	3.223	344
10/12/2017 8:20	3.622	334.2
10/12/2017 8:30	3.349	337.8
10/12/2017 8:40	2.805	5.345
10/12/2017 8:50	3.479	345.1
10/12/2017 9:00	3.863	344
10/12/2017 9:10	3.747	0.197
10/12/2017 9:20	3.767	355.2
10/12/2017 9:30	3.383	342.4
10/12/2017 9:40	4.254	340.2
10/12/2017 9:50	4.368	7.935
10/12/2017 10:00	3.793	358.4
10/12/2017 10:10	3.244	10.69

Date & time	Wind speed (m/s)	Wind Direction (°)
10/12/2017 10:20	3.302	2.279
10/12/2017 10:30	2.264	343.3
10/12/2017 10:40	1.936	8.04
10/12/2017 10:50	2.68	328.1
10/12/2017 11:00	3.342	326.5
10/12/2017 11:10	3.883	349.6
10/12/2017 11:20	4.175	340.8
10/12/2017 11:30	3.704	325.4
10/12/2017 11:40	1.942	318.7
10/12/2017 11:50	2.27	320.3
10/12/2017 12:00	3.113	340.4
10/12/2017 12:10	3.216	310
10/12/2017 12:20	3.011	247.4
10/12/2017 12:30	2.843	280.2
10/12/2017 12:40	3.25	10.41
10/12/2017 12:50	2.115	1.112
10/12/2017 13:00	2.377	294.2
10/12/2017 13:10	2.558	308
10/12/2017 13:20	1.691	264.5
10/12/2017 13:30	3.724	292.2
10/12/2017 13:40	1.998	247.9
10/12/2017 13:50	2.812	299.4
10/12/2017 14:00	2.738	315
10/12/2017 14:10	3.922	4.012
10/12/2017 14:20	2.806	5.794
10/12/2017 14:30	1.174	13.9
10/12/2017 14:40	2.398	224.3
10/12/2017 14:50	3.718	212
10/12/2017 15:00	2.769	183
10/12/2017 15:10	1.251	198.3
10/12/2017 15:20	1.928	131.9
10/12/2017 15:30	2.8	231.6
10/12/2017 15:40	2.3	252.5
10/12/2017 15:50	3.689	240.2
10/12/2017 16:00	2.36	249.5
10/12/2017 16:10	2.01	240.8
10/12/2017 16:20	3.202	194
10/12/2017 16:30	2.548	191.6
10/12/2017 16:40	3.189	154.3
10/12/2017 16:50	2.415	191.5
10/12/2017 17:00	2.416	145.2
10/12/2017 17:10	1.444	144.1
10/12/2017 17:20	1.967	127.1
10/12/2017 17:30	3.572	158.2
10/12/2017 17:40	2.702	180.6
10/12/2017 17:50	2.46	168.1
10/12/2017 18:00	2.168	188.1
10/12/2017 18:10	3.079	144.8
10/12/2017 18:20	3.916	162.9
10/12/2017 18:30	4.121	163.5
10/12/2017 18:40	4.442	162

Date & time	Wind speed (m/s)	Wind Direction (°)
10/12/2017 18:50	3.9	160.6
10/12/2017 19:00	3.48	161.5
10/12/2017 19:10	2.981	159.8
10/12/2017 19:20	2.785	151.7
10/12/2017 19:30	2.879	148.3
10/12/2017 19:40	2.33	137.4
10/12/2017 19:50	2.184	141.7
10/12/2017 20:00	2.284	135.1
10/12/2017 20:10	2.461	131.5
10/12/2017 20:20	2.417	126.4
10/12/2017 20:30	2.423	124.8
10/12/2017 20:40	2.521	129
10/12/2017 20:50	2.382	132.4
10/12/2017 21:00	2.292	135
10/12/2017 21:10	2.364	140.9
10/12/2017 21:20	2.411	143
10/12/2017 21:30	2.522	150.5
10/12/2017 21:40	2.298	168.2
10/12/2017 21:50	1.543	158.7
10/12/2017 22:00	0.668	127.6
10/12/2017 22:10	0.849	137.8
10/12/2017 22:20	0.913	146.7
10/12/2017 22:30	1.217	132.5
10/12/2017 22:40	1.16	141.6
10/12/2017 22:50	1.347	138.8
10/12/2017 23:00	1.332	140.1
10/12/2017 23:10	1.934	149.2
10/12/2017 23:20	2.251	139.8
10/12/2017 23:30	1.122	146.7
10/12/2017 23:40	1.068	144
10/12/2017 23:50	1.685	155.4
11/12/2017 0:00	1.574	158
11/12/2017 0:10	1.26	141.1
11/12/2017 0:20	0.613	137.3
11/12/2017 0:30	1.121	141.3
11/12/2017 0:40	1.014	129.5
11/12/2017 0:50	1.362	126
11/12/2017 1:00	1.307	116.4
11/12/2017 1:10	1.217	112.9
11/12/2017 1:20	2.928	67.18
11/12/2017 1:30	2.626	83.5
11/12/2017 1:40	2.381	82.9
11/12/2017 1:50	1.644	76.89
11/12/2017 2:00	1.061	70.53
11/12/2017 2:10	1.165	35.93
11/12/2017 2:20	0.875	34.28
11/12/2017 2:30	0.797	50.05
11/12/2017 2:40	0.795	63.49
11/12/2017 2:50	0.739	73.81
11/12/2017 3:00	0.139	58.67
11/12/2017 3:10	0.233	227.4

Date & time	Wind speed (m/s)	Wind Direction (°)
11/12/2017 3:20	0.226	235.4
11/12/2017 3:30	0.209	50.08
11/12/2017 3:40	0.477	53.04
11/12/2017 3:50	0.005	54.82
11/12/2017 4:00	0.017	54.77
11/12/2017 4:10	0.457	151.6
11/12/2017 4:20	0.492	182.7
11/12/2017 4:30	0.549	188.2
11/12/2017 4:40	0.195	176.2
11/12/2017 4:50	0.127	172.6
11/12/2017 5:00	0.591	170.6
11/12/2017 5:10	0.628	167.6
11/12/2017 5:20	0.766	170.6
11/12/2017 5:30	0.638	173.9
11/12/2017 5:40	0.454	171
11/12/2017 5:50	0.735	164
11/12/2017 6:00	0.876	139.7
11/12/2017 6:10	0.998	112.9
11/12/2017 6:20	1.365	86.1
11/12/2017 6:30	1.211	74.17
11/12/2017 6:40	1.856	45.72
11/12/2017 6:50	2.132	42.34
11/12/2017 7:00	2.639	37.87
11/12/2017 7:10	2.319	36.78
11/12/2017 7:20	1.623	11.9
11/12/2017 7:30	1.763	337
11/12/2017 7:40	2.173	336.6
11/12/2017 7:50	2.505	338.1
11/12/2017 8:00	2.604	333.2
11/12/2017 8:10	3.724	328.7
11/12/2017 8:20	3.42	337.8
11/12/2017 8:30	4.848	337.8
11/12/2017 8:40	4.661	335.1
11/12/2017 8:50	4.544	319.9
11/12/2017 9:00	4.863	322.6
11/12/2017 9:10	4.446	321.3
11/12/2017 9:20	4.199	303.5
11/12/2017 9:30	4.539	328.5
11/12/2017 9:40	3.983	308.3
11/12/2017 9:50	3.715	309.3
11/12/2017 10:00	3.101	312.1
11/12/2017 10:10	3.461	316.5
11/12/2017 10:20	3.164	328.6
11/12/2017 10:30	1.891	328
11/12/2017 10:40	3.592	326.5
11/12/2017 10:50	3.147	298.4
11/12/2017 11:00	3.255	324
11/12/2017 11:10	3.113	301.5
11/12/2017 11:20	3.193	246.2
11/12/2017 11:30	3.686	245.1
11/12/2017 11:40	2.689	351

Date & time	Wind speed (m/s)	Wind Direction (°)
11/12/2017 11:50	2.991	250.1
11/12/2017 12:00	1.166	273.6
11/12/2017 12:10	1.696	271.2
11/12/2017 12:20	2.811	230.2
11/12/2017 12:30	3.049	169.2
11/12/2017 12:40	2.285	150.2
11/12/2017 12:50	4.149	218.6
11/12/2017 13:00	3.014	215.6
11/12/2017 13:10	2.631	211.5
11/12/2017 13:20	3.263	230.9
11/12/2017 13:30	3.551	199.9
11/12/2017 13:40	2.417	304.4
11/12/2017 13:50	3.761	226.5
11/12/2017 14:00	3.105	210.3
11/12/2017 14:10	2.575	209
11/12/2017 14:20	2.68	256.6
11/12/2017 14:30	2.932	237.6
11/12/2017 14:40	2.988	226.3
11/12/2017 14:50	2.332	203
11/12/2017 15:00	2.289	221.3
11/12/2017 15:10	4.342	242.9
11/12/2017 15:20	2.445	199.6
11/12/2017 15:30	3.57	223.4
11/12/2017 15:40	3.607	228.3
11/12/2017 15:50	3.389	220.4
11/12/2017 16:00	3.026	261.4
11/12/2017 16:10	3.565	197.3
11/12/2017 16:20	2.048	214.4
11/12/2017 16:30	3.355	195.4
11/12/2017 16:40	2.984	155.1
11/12/2017 16:50	4.765	134.7
11/12/2017 17:00	4.533	146.2
11/12/2017 17:10	4.746	160.8
11/12/2017 17:20	4.776	147
11/12/2017 17:30	4.161	158.4
11/12/2017 17:40	4.438	154.1
11/12/2017 17:50	3.549	148.7
11/12/2017 18:00	4.059	149.5
11/12/2017 18:10	4.173	165.3
11/12/2017 18:20	3.616	152.8
11/12/2017 18:30	3.022	146.5
11/12/2017 18:40	3.414	144.6
11/12/2017 18:50	3.172	143.2
11/12/2017 19:00	3.001	142.2
11/12/2017 19:10	2.835	143.4
11/12/2017 19:20	2.595	138.5
11/12/2017 19:30	2.243	135.9
11/12/2017 19:40	1.638	148.9
11/12/2017 19:50	1.753	143.3
11/12/2017 20:00	1.864	136
11/12/2017 20:10	2.168	130.2

Date & time	Wind speed (m/s)	Wind Direction (°)
11/12/2017 20:20	2.009	141.9
11/12/2017 20:30	2.443	144.6
11/12/2017 20:40	2.469	145.6
11/12/2017 20:50	2.263	139.9
11/12/2017 21:00	2.649	139.2
11/12/2017 21:10	2.169	133.6
11/12/2017 21:20	1.953	136.1
11/12/2017 21:30	2.391	139.1
11/12/2017 21:40	2.514	139.1
11/12/2017 21:50	2.433	143
11/12/2017 22:00	2.457	141
11/12/2017 22:10	3.026	138.7
11/12/2017 22:20	3.284	140.2
11/12/2017 22:30	2.989	140.2
11/12/2017 22:40	2.678	132.8
11/12/2017 22:50	2.822	131.1
11/12/2017 23:00	2.716	131.9
11/12/2017 23:10	2.432	126.7
11/12/2017 23:20	2.161	131.6
11/12/2017 23:30	1.531	131.5
11/12/2017 23:40	0.75	119.9
11/12/2017 23:50	1.018	116.9
12/12/2017 0:00	1.308	124.4
12/12/2017 0:10	1.332	122.9
12/12/2017 0:20	1.23	131
12/12/2017 0:30	1.149	139.3
12/12/2017 0:40	1.035	145.5
12/12/2017 0:50	1.406	153.8
12/12/2017 1:00	1.382	144.3
12/12/2017 1:10	1.72	152.4
12/12/2017 1:20	1.903	161.7
12/12/2017 1:30	1.465	168
12/12/2017 1:40	1.338	152.8
12/12/2017 1:50	1.291	139.2
12/12/2017 2:00	2.295	144
12/12/2017 2:10	2.529	142
12/12/2017 2:20	2.281	137.2
12/12/2017 2:30	2.229	99.8
12/12/2017 2:40	2.081	61.31
12/12/2017 2:50	1.397	98.5
12/12/2017 3:00	1.142	99.9
12/12/2017 3:10	0.9	86.5
12/12/2017 3:20	0.721	88.7
12/12/2017 3:30	0.872	98.4
12/12/2017 3:40	0.864	104.6
12/12/2017 3:50	0.867	122.2
12/12/2017 4:00	1.096	122
12/12/2017 4:10	1.02	137.7
12/12/2017 4:20	1.383	160.9
12/12/2017 4:30	0.831	161.1
12/12/2017 4:40	0.614	105.6

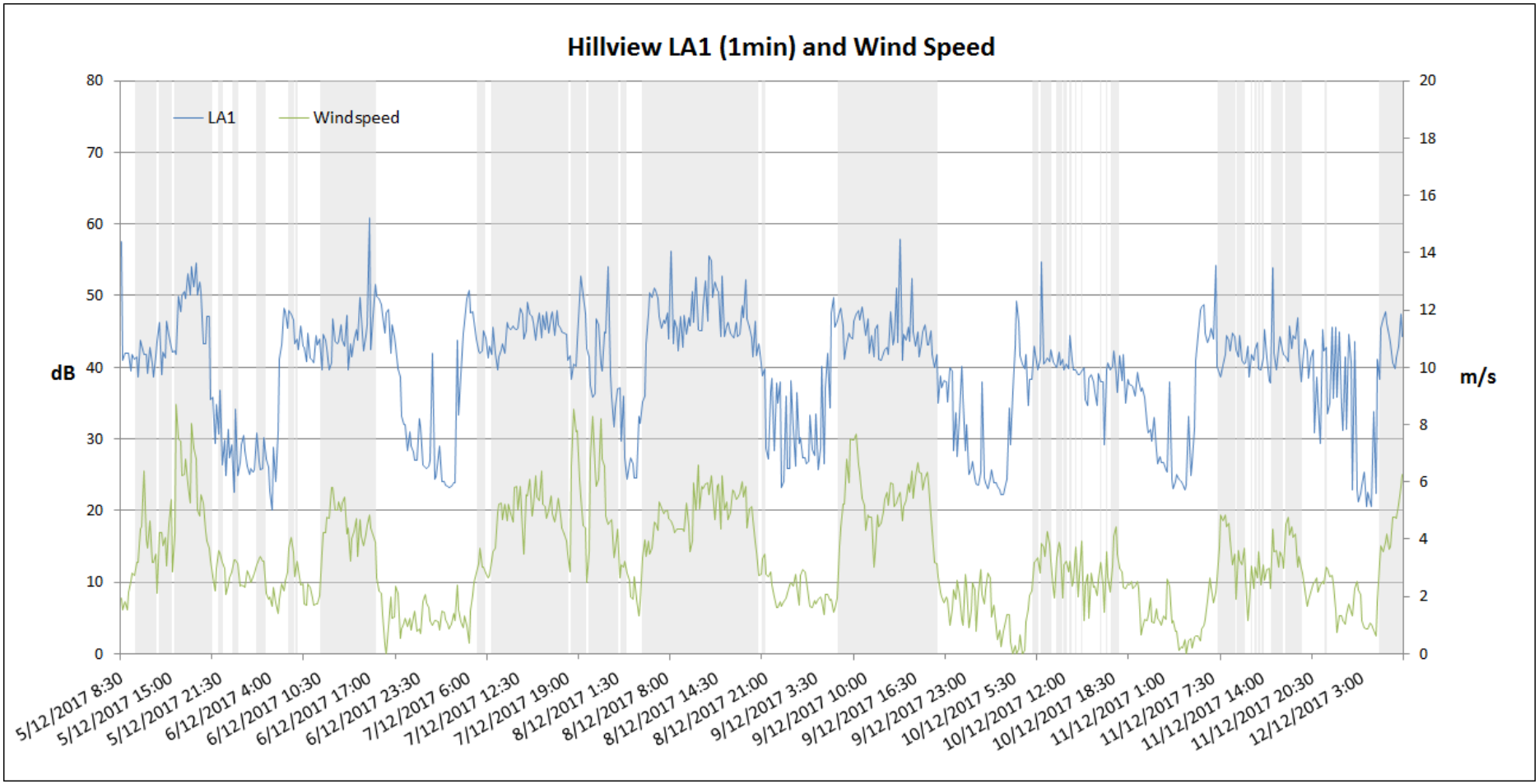
Date & time	Wind speed (m/s)	Wind Direction (°)
12/12/2017 4:50	0.857	78.52
12/12/2017 5:00	1.842	58.8
12/12/2017 5:10	3.176	57.37
12/12/2017 5:20	3.718	54.9
12/12/2017 5:30	3.778	51.5
12/12/2017 5:40	3.577	48.98
12/12/2017 5:50	3.859	42.95
12/12/2017 6:00	3.897	40.72
12/12/2017 6:10	4.177	41.29
12/12/2017 6:20	4.126	41.52
12/12/2017 6:30	3.666	40.85
12/12/2017 6:40	3.716	35.29
12/12/2017 6:50	4.368	36.49
12/12/2017 7:00	4.78	32.85
12/12/2017 7:10	4.762	26.88
12/12/2017 7:20	4.648	15.8
12/12/2017 7:30	4.739	14.42
12/12/2017 7:40	5.232	5.927
12/12/2017 7:50	5.151	358.3
12/12/2017 8:00	5.84	359.5
12/12/2017 8:10	6.277	344.1
12/12/2017 8:20	7.356	348

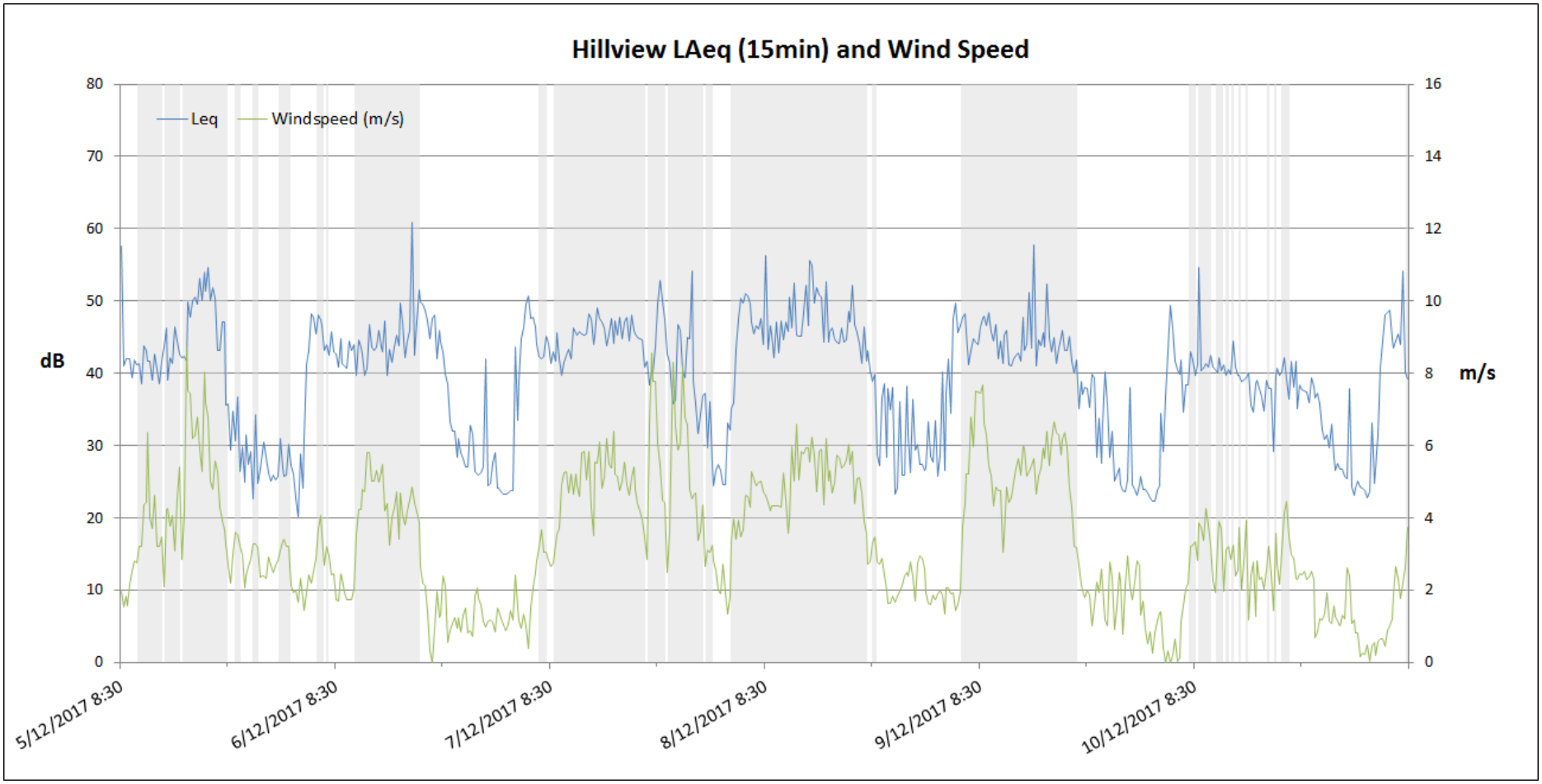
Appendix D – Full Results Graphs

Note:

- Grey shaded areas indicate periods when wind speeds were in excess of 3 m/s; data from these periods have been excluded in the calculation for average results presented in Table 7.
- L_{A1} data is only plotted for night periods, which is when the L_{A1} criteria applies.

Hillview

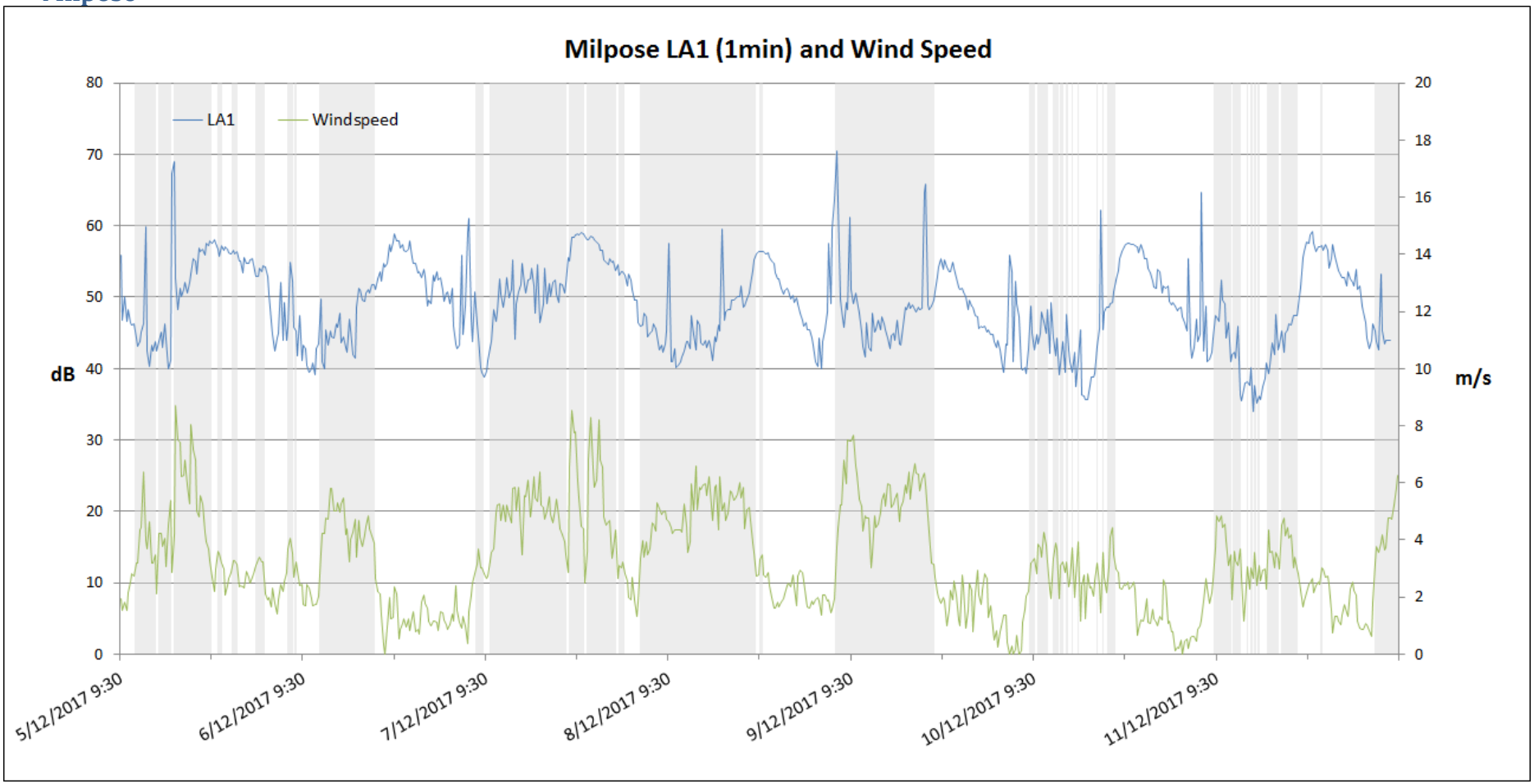


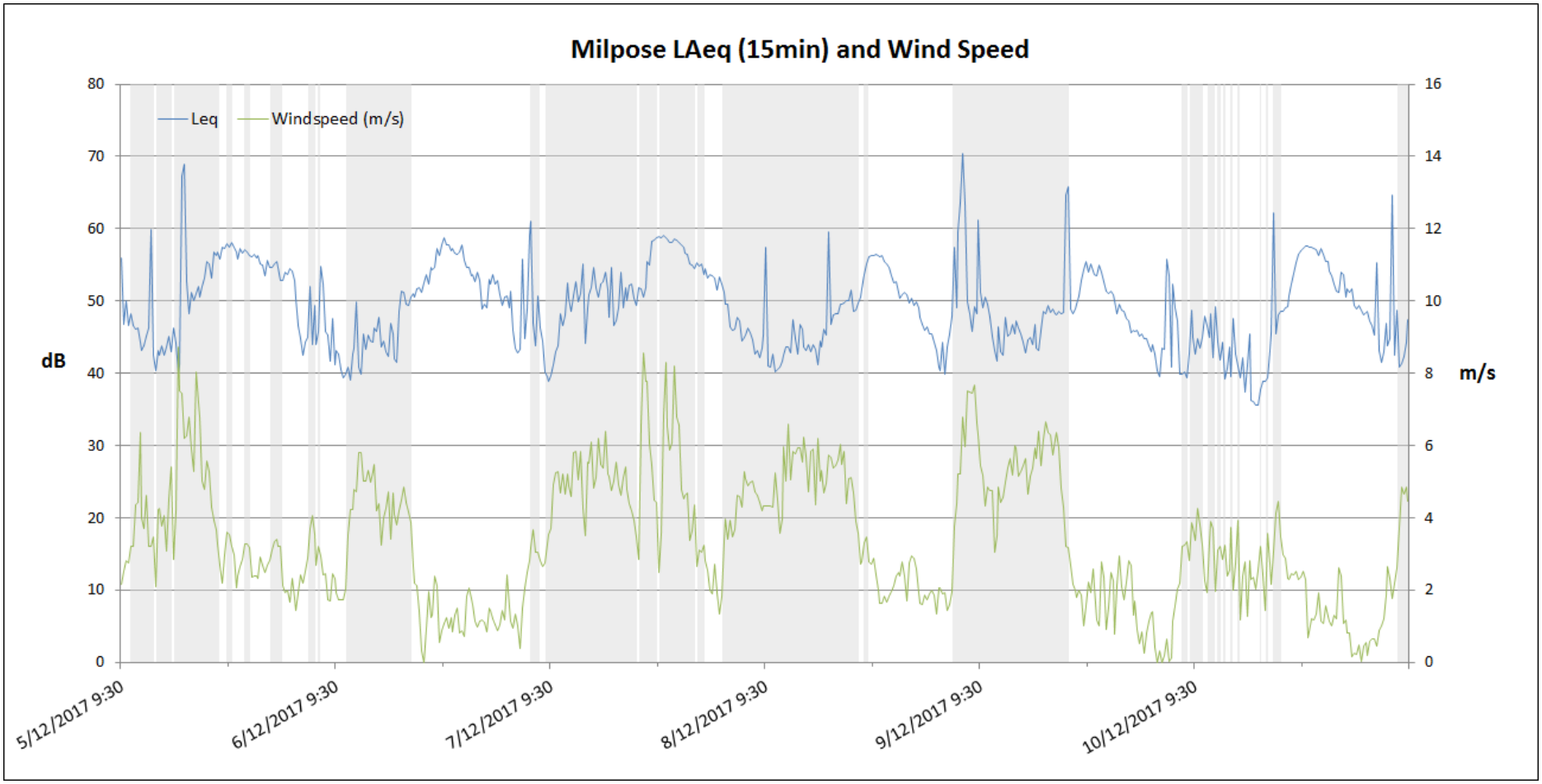


Hubberstone

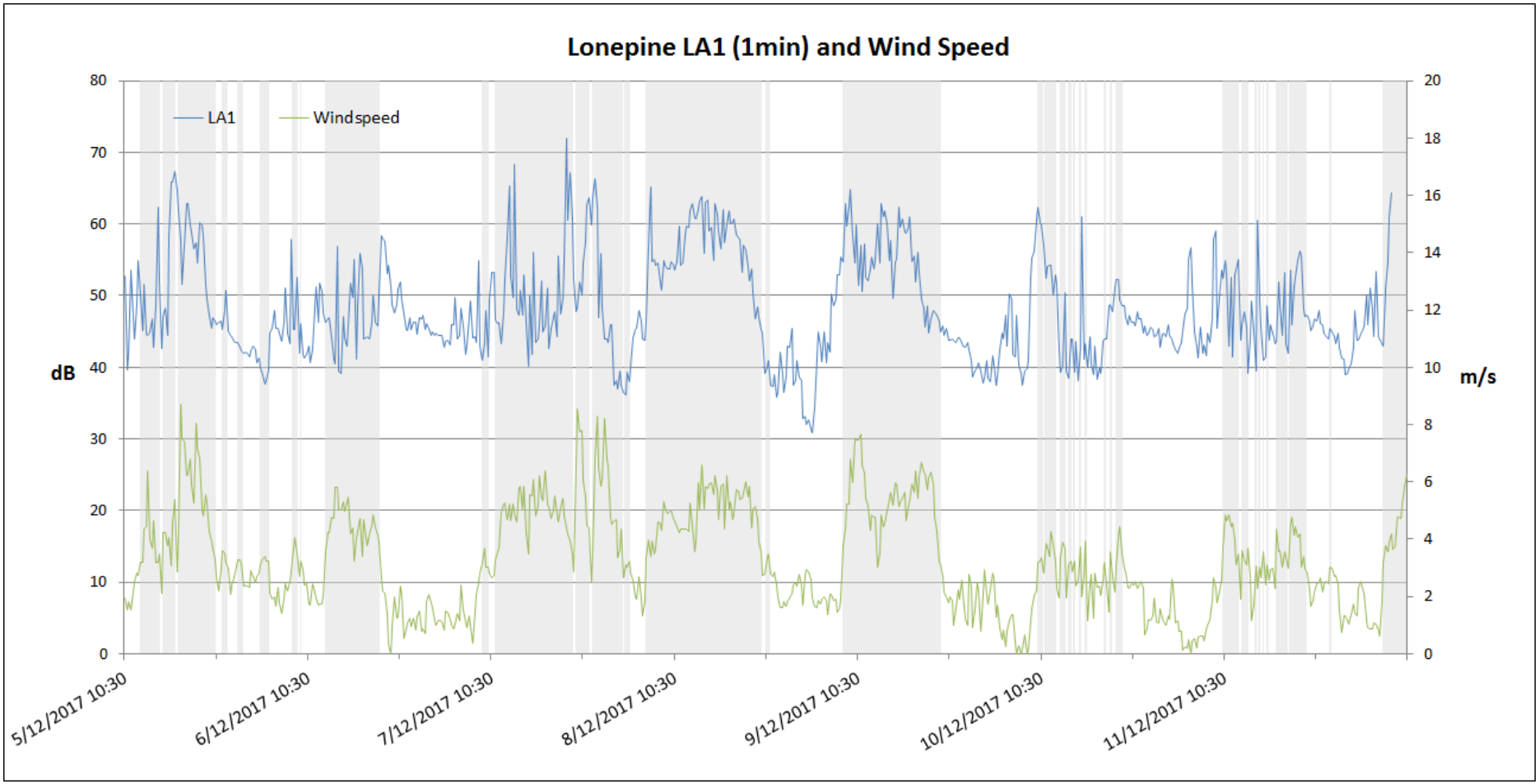
UNAVAILABLE DUE TO MAINTENANCE

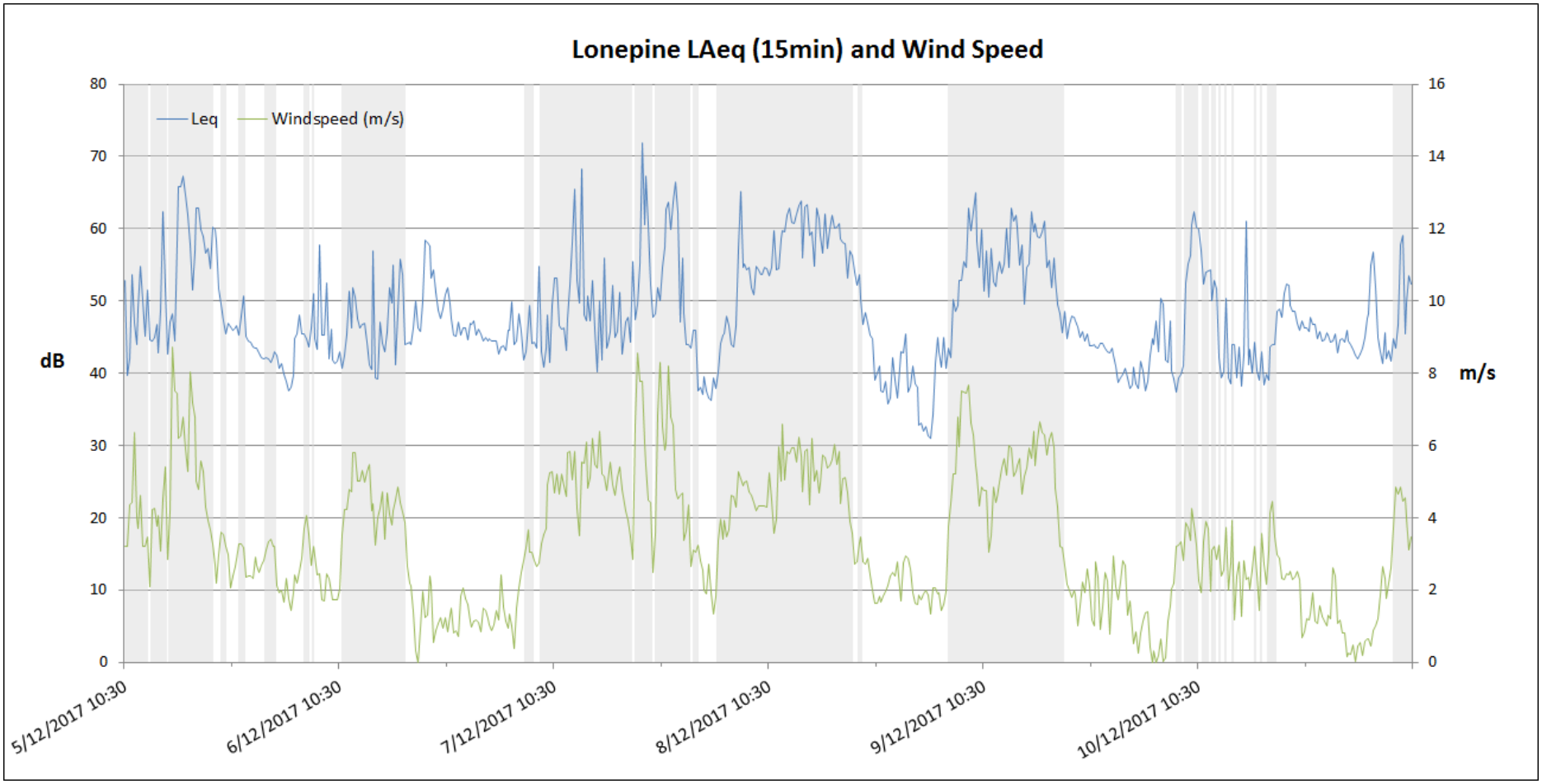
Milpose





Lone Pine





-End of report-