



**esp**

Environmental &  
Safety Professionals

## ENVIRONMENTAL NOISE MONITORING QUARTER 2, 2017



***Northparkes Mines***  
***PO Box 995***  
***Parkes NSW 2870***

**Job No:** J36276  
**Report issued:** 9 August 2017

## **ESP – ENVIRONMENTAL & SAFETY PROFESSIONALS**

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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	<i>Final version</i>	9/8/2017	B. Ramakrishnappa

## 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 14<sup>th</sup> to the 16<sup>th</sup> of June 2017 and unattended noise monitoring was undertaken from the 14<sup>th</sup> to the 21<sup>st</sup> of June 2017.

Attended monitoring was undertaken during favourable atmospheric conditions. Attended noise monitoring results indicate that noise emissions from the mine site comply with the development consent and project approval criteria.

## TABLE OF CONTENTS

EXECUTIVE SUMMARY	3
1. INTRODUCTION	5
2. BACKGROUND	5
3. NOISE LIMITS	6
Noise Management Plan	6
Project Specific Criteria	6
4. NOISE LEVEL MEASUREMENT	7
Methodology - Equipment	7
Methodology – Meteorological Conditions	7
Observations	7
Attended Noise Monitoring Results	8
Unattended Noise Monitoring Results	12
5. DISCUSSION	13
Attended Noise Monitoring	13
Unattended Noise Monitoring	13
6. CONCLUSION	14
Appendix A – Monitoring location map	15
Appendix B – Equipment Calibration Details	16
Appendix C – Weather Conditions during Monitoring Period	19
Wind-Rose	19
Tabulated Meteorological Conditions	20
Appendix D – Full Results Graphs	32
Hillview	33
Hubberstone	35
Milpose	37
Lone Pine	39

## 1. INTRODUCTION

ESP was commissioned by Northparkes Mines (NPM) to undertake an Environmental Noise Assessment during Quarter 2, 2017 as part of their regular noise monitoring program in accordance with Development Consent 06-0026.

This report presents:

- results of attended measurements from day, evening and night operation of the mine for the period from the 14<sup>th</sup> to the 16<sup>th</sup> of June 2017;
- results of unattended measurements from the 14<sup>th</sup> to the 21<sup>st</sup> of June 2017 and;
- an assessment of the results against Development Consent 06-0026 (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 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 DC 06-0026 and 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.

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\* 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 Cirrus 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)	Cirrus CR171C	G066240	23/05/2018
SLM calibrator	Cirrus CR515	65189	31/03/2018

**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.

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.”.

<b>Location</b>	<b>Date and Time</b>	<b><math>L_{A1}</math> dB</b>	<b><math>L_{A10}</math> dB</b>	<b><math>L_{Aeq}</math> dB</b>	<b><math>L_{A90}</math> dB</b>	<b>Compliance?</b>	<b>Notes</b>
<b>Hillview</b>	14/06/17 13:00	37	31	<b>29</b>	23	Yes	
	14/06/17 13:15	44	34	<b>32</b>	23	Yes	Some bird & traffic noise. Mine just audible.
	14/06/17 13:45	46	35	<b>33</b>	23	Yes	
<b>Hubberstone</b>	14/06/17 13:55	46	33	<b>33</b>	24	Yes	
	14/06/17 14:10	41	33	<b>33</b>	25	Yes	Some bird noise. Frequent traffic noise. Mine just audible.
	14/06/17 14:25	39	34	<b>34</b>	26	Yes	
<b>Milpose</b>	14/06/17 14:55	42	35	<b>32</b>	23	Yes	
	14/06/17 15:10	41	34	<b>32</b>	25	Yes	Bird & sheep noise. Incessant sheep noise during final measurement. Mine just audible.
	14/06/17 15:25	43	38	<b>35</b>	26	Yes	
<b>Lonepine</b>	14/06/17 15:50	39	33	<b>30</b>	20	Yes	
	14/06/17 16:05	38	33	<b>30</b>	19	Yes	Some bird noise. Aircraft & traffic noise. Farm machinery noise in distance. Mine inaudible.
	14/06/17 16:20	39	31	<b>30</b>	19	Yes	

**Table 4: Daytime Attended Noise Results**

<b>Location</b>	<b>Date and Time</b>	$L_{A1}$ dB	$L_{A10}$ dB	$L_{Aeq}$ dB	$L_{A90}$ dB	<b>Compliance?</b>	<b>Notes</b>
<b>Hillview</b>	14/06/17 19:00	39	35	<b>33</b>	30	Yes	
	14/06/17 19:15	37	33	<b>29</b>	21	Yes	Incessant traffic noise. Mine inaudible.
	14/06/17 19:30	37	33	<b>29</b>	18	Yes	
<b>Hubberstone</b>	14/06/17 18:10	33	29	<b>26</b>	22	Yes	
	14/06/17 18:25	38	30	<b>33</b>	24	Yes	Mine clearly audible.
	14/06/17 18:40	35	30	<b>27</b>	22	Yes	
<b>Milpose</b>	15/06/17 21:00	36	30	<b>29</b>	24	Yes	
	15/06/17 21:15	36	30	<b>29</b>	25	Yes	Livestock noise. Shot from scare-gun approximately every 10 minutes. Mine clearly audible.
	15/06/17 21:30	34	29	<b>28</b>	24	Yes	
<b>Lonepine</b>	15/06/17 20:00	31	24	<b>23</b>	17	Yes	
	15/06/17 20:15	31	25	<b>23</b>	18	Yes	Mine audible.
	15/06/17 20:30	33	26	<b>23</b>	18	Yes	

Table 5: Evening Attended Noise Results

<b>Location</b>	<b>Date and Time</b>	<b>L<sub>A1</sub> dB</b>	<b>L<sub>A10</sub> dB</b>	<b>L<sub>Aeq</sub> dB</b>	<b>L<sub>A90</sub> dB</b>	<b>Compliance?</b>	<b>Notes</b>
<b>Hillview</b>	16/06/17 00:40	<b>33</b>	27	<b>25</b>	20	Yes	Concentrate truck passed during second measurement. Traffic during final measurement. Mine clearly audible.
	16/06/17 00:55	<b>34</b>	29	<b>25</b>	17	Yes	
	16/06/17 01:10	<b>33</b>	27	<b>26</b>	18	Yes	
<b>Hubberstone</b>	15/06/17 23:45	<b>32</b>	23	<b>22</b>	17	Yes	Mine audible.
	16/06/17 00:00	<b>32</b>	24	<b>22</b>	16	Yes	
	16/06/17 00:15	<b>35</b>	29	<b>26</b>	20	Yes	
<b>Milpose</b>	15/06/17 22:00	<b>37</b>	32	<b>31</b>	22	Yes	Continuous livestock noise. Aircraft noise. Mine audible.
	15/06/17 22:15	<b>37</b>	33	<b>31</b>	25	Yes	
	15/06/17 22:30	<b>38</b>	35	<b>33</b>	30	Yes	
<b>Lonepine</b>	15/06/17 22:45	<b>35</b>	29	<b>26</b>	22	Yes	Mine clearly audible.
	15/06/17 23:00	<b>36</b>	30	<b>27</b>	21	Yes	
	15/06/17 23:15	<b>35</b>	28	<b>27</b>	22	Yes	

**Table 6: Night Attended Noise Results**

## Unattended Noise Monitoring Results

Noise levels were continuously monitored over a period of seven days from the 14<sup>th</sup> to the 21<sup>st</sup> of June. 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.

<b>Location</b>	<b><math>L_{Aeq\ (15min)}</math></b>			<b><math>L_{A1\ (1min)}</math></b>
	<b>Day</b>	<b>Evening</b>	<b>Night</b>	<b>Night</b>
<b>Hillview</b>	45	39	36	40
<b>Hubberstone</b>	44	34	35	39
<b>Lone Pine</b>	45	39	37	41
<b>Milpose</b>	44	33	33	37

Table 7: Summary of Unattended Noise Monitoring, 14/06/17 – 21/06/17

## 5. DISCUSSION

### Attended Noise Monitoring

Attended monitoring was conducted in near-ideal conditions.

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

Measurements indicate compliance with the night limit of  $L_{A1}$  45 dB at all locations.

It is understood that the only one surface crusher was operating during the day monitoring periods. The mine was operating as normal during the evening and night monitoring periods.

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. Nonetheless, ESP notes that average night-time results from unattended monitoring indicated compliance with the  $L_{A1}$  45 dB limit at all locations.

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

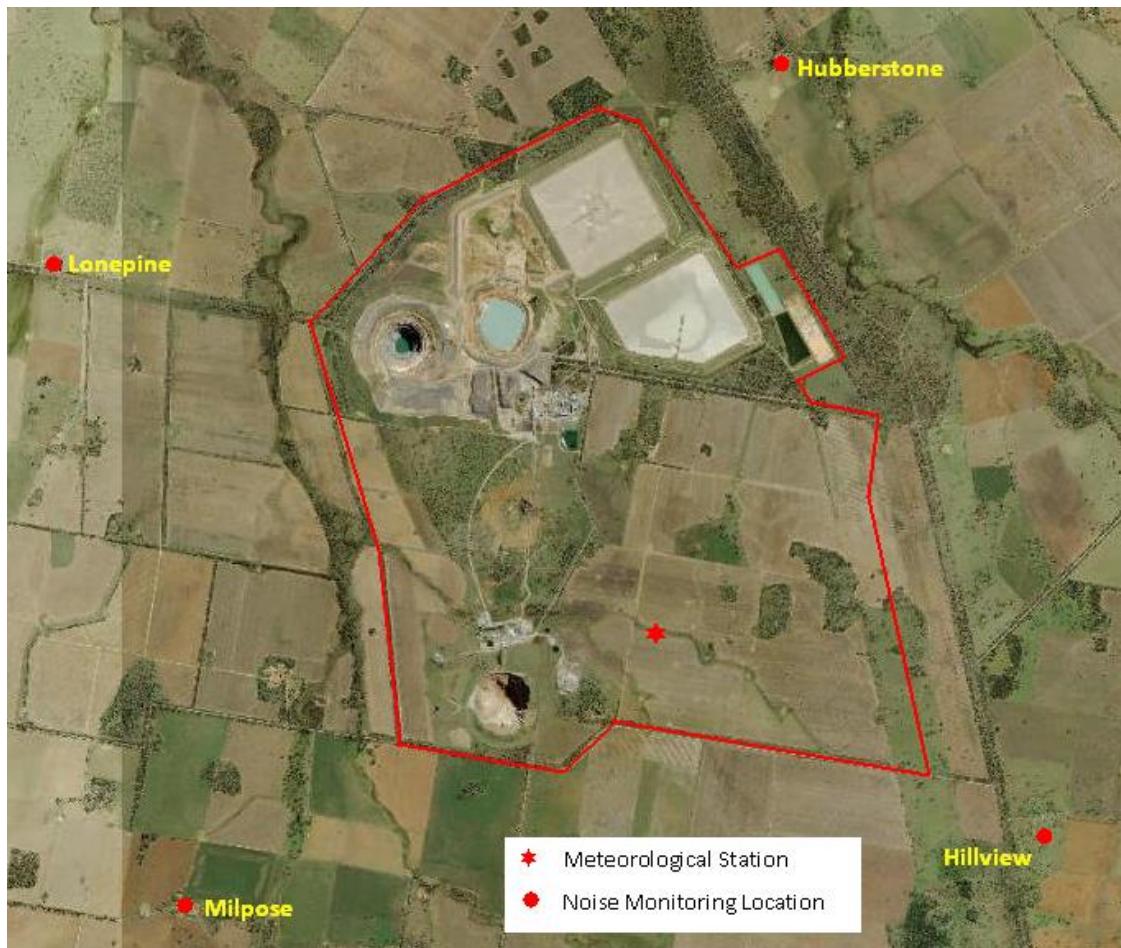
Environmental noise monitoring was conducted at four noise sensitive receivers around the Northparkes Mine site; attended monitoring was conducted from the 14<sup>th</sup> to the 16<sup>th</sup> of June 2017 and unattended monitoring was conducted from the 14<sup>th</sup> to the 21<sup>st</sup> of June 2017.

Attended noise monitoring during this round was conducted during favourable atmospheric conditions.

Attended noise monitoring results indicate noise emissions from the mine site comply with the development consent criteria.

Despite unattended monitoring invariably including extraneous noise, for the night period, the average unattended L<sub>A1(1min)</sub> results were below 45 dB.

## Appendix A – Monitoring location map



## Appendix B – Equipment Calibration Details



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**Sound Level Meter**  
IEC 61672-3.2013

## Calibration Certificate

Calibration Number C17244

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<b>Client Details</b>	ESP Environmental & Safety Professionals Unit 2, 2B Parker Street FOOTSCRAY VIC 3011
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<b>Equipment Tested/ Model Number :</b>	Rion NL-52EX
<b>Instrument Serial Number :</b>	00375605
<b>Microphone Serial Number :</b>	11074
<b>Pre-amplifier Serial Number :</b>	65732

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<b>Pre-Test Atmospheric Conditions</b>	<b>Post-Test Atmospheric Conditions</b>
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

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

Approved Signatory : 

Ken Williams

<b>Clause and Characteristic Tested</b>	<b>Result</b>	<b>Clause and Characteristic Tested</b>	<b>Result</b>
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.

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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.

PAGE 1 OF 1





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**Octave Band Filter  
AS 4476:1997**  
**Calibration Certificate**

Calibration Number C17244A

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

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Calibration Technician : Vicky Jaiswal	Secondary Check: Sandra Minto
Calibration Date : 24/05/2017	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 - Environmental Conditions			
Electrical Tests		Temperature	±0.05°C
< 16Hz	±0.19dB	Relative Humidity	±0.46%
16Hz-100Hz	±0.11dB	Barometric Pressure	±0.017kPa
100Hz-1000Hz	±0.09dB		
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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The results of the tests, calibrations and/or measurements included in this document are traceable to  
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equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1



## Appendix C – Weather Conditions during Monitoring Period

Note. Data provided by Northparkes Mine.

### Wind-Rose

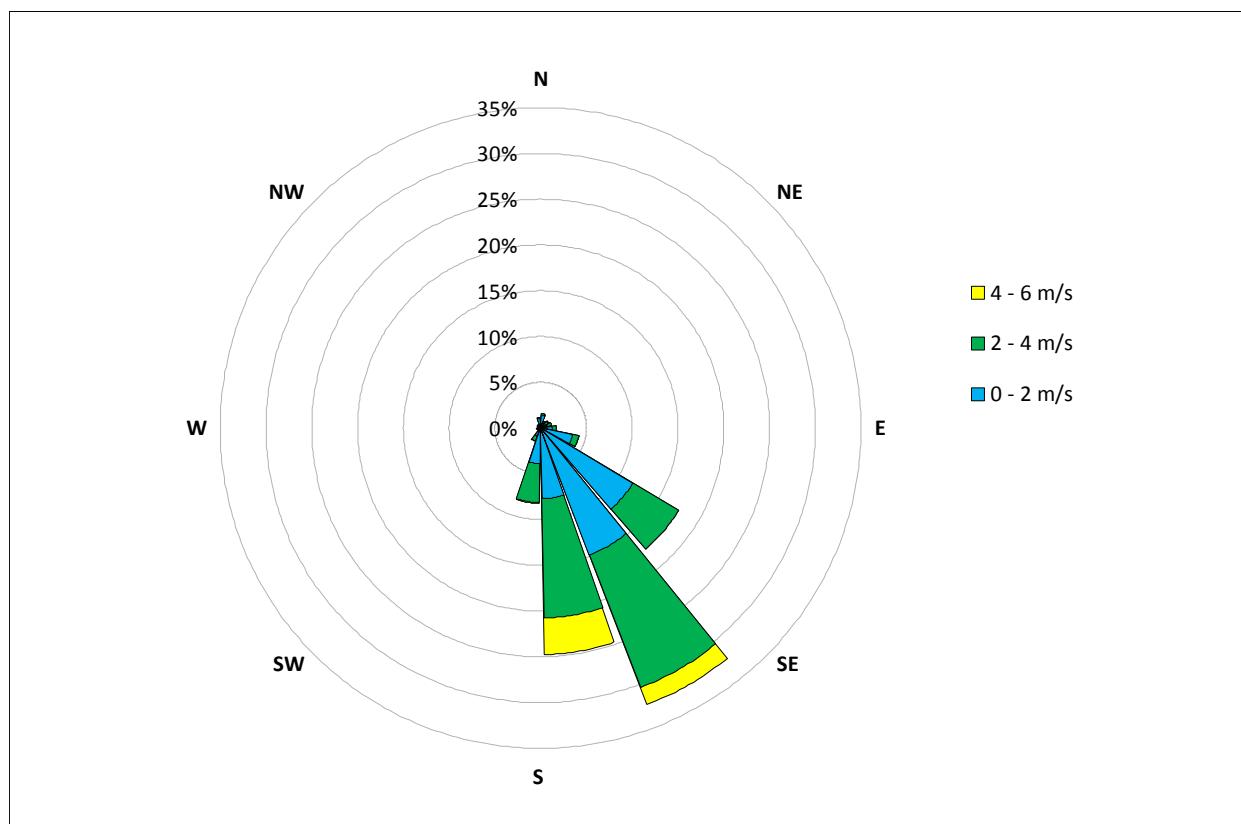


Figure 1 - Wind rose for period 14/06/17 – 21/06/17

## Tabulated Meteorological Conditions

Date & time	Wind speed (m/s)	Wind Direction (°)
14/06/2017 0:00	1.1	119
14/06/2017 0:10	2	135
14/06/2017 0:20	1.8	137
14/06/2017 0:30	1	135
14/06/2017 0:40	1	123
14/06/2017 0:50	1	128
14/06/2017 1:00	0.6	123
14/06/2017 1:10	1.3	132
14/06/2017 1:20	1.6	146
14/06/2017 1:30	1.4	144
14/06/2017 1:40	1.1	135
14/06/2017 1:50	1.2	138
14/06/2017 2:00	0.8	184
14/06/2017 2:10	0.2	227
14/06/2017 2:20	0	226
14/06/2017 2:30	1.1	236
14/06/2017 2:40	0.6	222
14/06/2017 2:50	1.4	83
14/06/2017 3:00	1.1	118
14/06/2017 3:10	0.8	160
14/06/2017 3:20	0.7	193
14/06/2017 3:30	0.6	142
14/06/2017 3:40	0.4	227
14/06/2017 3:50	0.6	238
14/06/2017 4:00	0.5	229
14/06/2017 4:10	0.9	135
14/06/2017 4:20	0.3	239
14/06/2017 4:30	0.9	183
14/06/2017 4:40	0.7	154
14/06/2017 4:50	1	179
14/06/2017 5:00	1.2	176
14/06/2017 5:10	1.4	182
14/06/2017 5:20	1.5	203
14/06/2017 5:30	0.4	186
14/06/2017 5:40	0.1	85
14/06/2017 5:50	1.1	134
14/06/2017 6:00	1.5	122
14/06/2017 6:10	1.7	139
14/06/2017 6:20	1.3	145
14/06/2017 6:30	1.1	171
14/06/2017 6:40	1.1	222
14/06/2017 6:50	1.3	239
14/06/2017 7:00	1.2	255
14/06/2017 7:10	0.8	225
14/06/2017 7:20	0	186
14/06/2017 7:30	0.2	176
14/06/2017 7:40	0.7	111
14/06/2017 7:50	1	108

Date & time	Wind speed (m/s)	Wind Direction (°)
14/06/2017 8:00	0.9	119
14/06/2017 8:10	0.3	150
14/06/2017 8:20	0.7	193
14/06/2017 8:30	0.6	214
14/06/2017 8:40	0.3	185
14/06/2017 8:50	0.3	129
14/06/2017 9:00	1	130
14/06/2017 9:10	0.8	124
14/06/2017 9:20	0.8	123
14/06/2017 9:30	0.7	114
14/06/2017 9:40	0.9	91
14/06/2017 9:50	1	109
14/06/2017 10:00	0.9	86
14/06/2017 10:10	1.4	97
14/06/2017 10:20	1.9	77
14/06/2017 10:30	2.4	85
14/06/2017 10:40	2.2	83
14/06/2017 10:50	1.9	68
14/06/2017 11:00	1.8	80
14/06/2017 11:10	1.6	115
14/06/2017 11:20	1.6	141
14/06/2017 11:30	1.7	101
14/06/2017 11:40	1.7	99
14/06/2017 11:50	2.5	71
14/06/2017 12:00	1.8	134
14/06/2017 12:10	2.2	158
14/06/2017 12:20	1.5	111
14/06/2017 12:30	1.7	139
14/06/2017 12:40	2.5	123
14/06/2017 12:50	1.4	110
14/06/2017 13:00	0.8	101
14/06/2017 13:10	1.6	127
14/06/2017 13:20	1.8	109
14/06/2017 13:30	1.1	73
14/06/2017 13:40	1.7	344
14/06/2017 13:50	1.7	313
14/06/2017 14:00	2.3	351
14/06/2017 14:10	1.6	344
14/06/2017 14:20	1.8	15
14/06/2017 14:30	1.1	96
14/06/2017 14:40	1.7	6
14/06/2017 14:50	1.2	33
14/06/2017 15:00	1.4	337
14/06/2017 15:10	1.4	318
14/06/2017 15:20	1.3	298
14/06/2017 15:30	0.8	14
14/06/2017 15:40	1.1	338
14/06/2017 15:50	0.9	360

Date & time	Wind speed (m/s)	Wind Direction (°)
14/06/2017 16:00	1	287
14/06/2017 16:10	0.8	291
14/06/2017 16:20	1.1	335
14/06/2017 16:30	0.5	312
14/06/2017 16:40	1.1	256
14/06/2017 16:50	1.7	242
14/06/2017 17:00	1.8	236
14/06/2017 17:10	1.6	207
14/06/2017 17:20	1.5	192
14/06/2017 17:30	1.9	183
14/06/2017 17:40	1.5	156
14/06/2017 17:50	1.7	151
14/06/2017 18:00	1.2	162
14/06/2017 18:10	1	137
14/06/2017 18:20	1.9	132
14/06/2017 18:30	2	151
14/06/2017 18:40	2.1	150
14/06/2017 18:50	1.3	147
14/06/2017 19:00	1.4	143
14/06/2017 19:10	1.8	139
14/06/2017 19:20	1.7	147
14/06/2017 19:30	1.4	135
14/06/2017 19:40	1.6	120
14/06/2017 19:50	1.6	135
14/06/2017 20:00	1.3	136
14/06/2017 20:10	1.2	145
14/06/2017 20:20	1.8	160
14/06/2017 20:30	1.4	156
14/06/2017 20:40	0.7	147
14/06/2017 20:50	0.3	151
14/06/2017 21:00	0.3	103
14/06/2017 21:10	1.3	104
14/06/2017 21:20	1.4	140
14/06/2017 21:30	1.5	148
14/06/2017 21:40	1.2	140
14/06/2017 21:50	1.1	142
14/06/2017 22:00	1	141
14/06/2017 22:10	1.6	27
14/06/2017 22:20	1.5	12
14/06/2017 22:30	1.9	13
14/06/2017 22:40	1.9	12
14/06/2017 22:50	1.4	9
14/06/2017 23:00	1.1	343
14/06/2017 23:10	1.3	360
14/06/2017 23:20	0.9	359
14/06/2017 23:30	0.8	359
14/06/2017 23:40	0.6	339
14/06/2017 23:50	0.1	345
15/06/2017 0:00	0	0
15/06/2017 0:10	0	0
15/06/2017 0:20	0	0

Date & time	Wind speed (m/s)	Wind Direction (°)
15/06/2017 0:30	0.2	346
15/06/2017 0:40	0.2	132
15/06/2017 0:50	0.9	130
15/06/2017 1:00	0.8	124
15/06/2017 1:10	0.8	130
15/06/2017 1:20	0.8	132
15/06/2017 1:30	0.8	110
15/06/2017 1:40	0.7	120
15/06/2017 1:50	0.8	132
15/06/2017 2:00	1.1	139
15/06/2017 2:10	1.6	151
15/06/2017 2:20	1.7	154
15/06/2017 2:30	1.3	160
15/06/2017 2:40	1.7	141
15/06/2017 2:50	1.9	142
15/06/2017 3:00	1.5	131
15/06/2017 3:10	1.6	131
15/06/2017 3:20	2.3	151
15/06/2017 3:30	2.4	149
15/06/2017 3:40	2	131
15/06/2017 3:50	2	126
15/06/2017 4:00	1.6	118
15/06/2017 4:10	1.4	122
15/06/2017 4:20	1.7	131
15/06/2017 4:30	1.8	132
15/06/2017 4:40	1.7	115
15/06/2017 4:50	1.7	149
15/06/2017 5:00	1.7	138
15/06/2017 5:10	1.7	151
15/06/2017 5:20	1.3	159
15/06/2017 5:30	1.1	152
15/06/2017 5:40	1.6	148
15/06/2017 5:50	1.5	159
15/06/2017 6:00	1.1	151
15/06/2017 6:10	1	138
15/06/2017 6:20	1.4	147
15/06/2017 6:30	1.5	147
15/06/2017 6:40	1.5	147
15/06/2017 6:50	1.8	140
15/06/2017 7:00	2.2	144
15/06/2017 7:10	2.3	145
15/06/2017 7:20	2.4	142
15/06/2017 7:30	2.4	141
15/06/2017 7:40	2.3	146
15/06/2017 7:50	2.3	146
15/06/2017 8:00	2.3	135
15/06/2017 8:10	1.9	136
15/06/2017 8:20	2.1	143
15/06/2017 8:30	2.1	154
15/06/2017 8:40	2.2	145
15/06/2017 8:50	2.4	140

Date & time	Wind speed (m/s)	Wind Direction (°)
15/06/2017 9:00	2	129
15/06/2017 9:10	1.3	135
15/06/2017 9:20	1.7	144
15/06/2017 9:30	1.5	154
15/06/2017 9:40	1.4	155
15/06/2017 9:50	1	83
15/06/2017 10:00	2.8	17
15/06/2017 10:10	2.5	2
15/06/2017 10:20	1.7	355
15/06/2017 10:30	1.5	22
15/06/2017 10:40	0.9	14
15/06/2017 10:50	1	347
15/06/2017 11:00	1.8	355
15/06/2017 11:10	0.9	1
15/06/2017 11:20	0.7	340
15/06/2017 11:30	0.7	127
15/06/2017 11:40	1.2	286
15/06/2017 11:50	1.4	346
15/06/2017 12:00	1	332
15/06/2017 12:10	1.4	314
15/06/2017 12:20	1	258
15/06/2017 12:30	1.5	230
15/06/2017 12:40	1.8	220
15/06/2017 12:50	2.5	215
15/06/2017 13:00	2.1	204
15/06/2017 13:10	2.1	202
15/06/2017 13:20	1.6	220
15/06/2017 13:30	1.6	241
15/06/2017 13:40	1.7	185
15/06/2017 13:50	2.2	216
15/06/2017 14:00	1.9	221
15/06/2017 14:10	1.9	205
15/06/2017 14:20	2.7	167
15/06/2017 14:30	3.1	179
15/06/2017 14:40	2.7	179
15/06/2017 14:50	3.1	164
15/06/2017 15:00	3.3	172
15/06/2017 15:10	2.7	173
15/06/2017 15:20	3.1	180
15/06/2017 15:30	2.9	182
15/06/2017 15:40	3.8	163
15/06/2017 15:50	3.5	165
15/06/2017 16:00	3.5	167
15/06/2017 16:10	2.8	156
15/06/2017 16:20	3	149
15/06/2017 16:30	2.7	149
15/06/2017 16:40	2.6	149
15/06/2017 16:50	2.3	154
15/06/2017 17:00	2.2	153
15/06/2017 17:10	2.1	155
15/06/2017 17:20	2.2	148

Date & time	Wind speed (m/s)	Wind Direction (°)
15/06/2017 17:30	1.8	152
15/06/2017 17:40	2.1	156
15/06/2017 17:50	2.4	164
15/06/2017 18:00	2.6	167
15/06/2017 18:10	2.3	155
15/06/2017 18:20	1.4	144
15/06/2017 18:30	1.9	131
15/06/2017 18:40	2.1	139
15/06/2017 18:50	2	132
15/06/2017 19:00	2	135
15/06/2017 19:10	1.8	129
15/06/2017 19:20	1.5	150
15/06/2017 19:30	2	157
15/06/2017 19:40	1.7	143
15/06/2017 19:50	1.5	128
15/06/2017 20:00	1.9	140
15/06/2017 20:10	1.6	146
15/06/2017 20:20	1.5	162
15/06/2017 20:30	0.9	151
15/06/2017 20:40	0.9	144
15/06/2017 20:50	0.4	196
15/06/2017 21:00	0.8	189
15/06/2017 21:10	0.3	171
15/06/2017 21:20	0	278
15/06/2017 21:30	0.2	278
15/06/2017 21:40	0.2	22
15/06/2017 21:50	0.2	158
15/06/2017 22:00	1	184
15/06/2017 22:10	0.6	186
15/06/2017 22:20	0.6	134
15/06/2017 22:30	1	140
15/06/2017 22:40	1.5	140
15/06/2017 22:50	1.8	138
15/06/2017 23:00	1.9	146
15/06/2017 23:10	1.9	163
15/06/2017 23:20	1	169
15/06/2017 23:30	1.8	156
15/06/2017 23:40	1.9	147
15/06/2017 23:50	1.1	126
16/06/2017 0:00	1.3	126
16/06/2017 0:10	2.4	131
16/06/2017 0:20	2.8	142
16/06/2017 0:30	2.7	141
16/06/2017 0:40	2.7	142
16/06/2017 0:50	2.9	143
16/06/2017 1:00	2.3	123
16/06/2017 1:10	1.7	128
16/06/2017 1:20	1.9	136
16/06/2017 1:30	2	138
16/06/2017 1:40	1.8	152
16/06/2017 1:50	1.2	131

Date & time	Wind speed (m/s)	Wind Direction (°)
16/06/2017 2:00	1	122
16/06/2017 2:10	0.6	143
16/06/2017 2:20	1.3	146
16/06/2017 2:30	2.5	154
16/06/2017 2:40	2.2	155
16/06/2017 2:50	1.4	166
16/06/2017 3:00	2.4	144
16/06/2017 3:10	2.3	138
16/06/2017 3:20	1.7	131
16/06/2017 3:30	2.8	135
16/06/2017 3:40	2.4	134
16/06/2017 3:50	1.7	148
16/06/2017 4:00	2	140
16/06/2017 4:10	2.6	154
16/06/2017 4:20	2.7	155
16/06/2017 4:30	2.7	153
16/06/2017 4:40	2	161
16/06/2017 4:50	2.6	159
16/06/2017 5:00	1.8	137
16/06/2017 5:10	0.3	139
16/06/2017 5:20	0.1	153
16/06/2017 5:30	0.1	227
16/06/2017 5:40	0.1	128
16/06/2017 5:50	1.3	113
16/06/2017 6:00	1.9	110
16/06/2017 6:10	1.9	138
16/06/2017 6:20	2.1	153
16/06/2017 6:30	1.5	127
16/06/2017 6:40	3	143
16/06/2017 6:50	2.1	135
16/06/2017 7:00	1.7	142
16/06/2017 7:10	2.1	136
16/06/2017 7:20	2	141
16/06/2017 7:30	1.8	150
16/06/2017 7:40	1	157
16/06/2017 7:50	1.3	113
16/06/2017 8:00	2.8	139
16/06/2017 8:10	2.4	147
16/06/2017 8:20	1.7	143
16/06/2017 8:30	0.8	137
16/06/2017 8:40	0.2	198
16/06/2017 8:50	1	159
16/06/2017 9:00	1.6	148
16/06/2017 9:10	0.7	146
16/06/2017 9:20	1	152
16/06/2017 9:30	2	143
16/06/2017 9:40	2.7	142
16/06/2017 9:50	1.4	127
16/06/2017 10:00	1.1	128
16/06/2017 10:10	1.2	154
16/06/2017 10:20	1.6	145

Date & time	Wind speed (m/s)	Wind Direction (°)
16/06/2017 10:30	0.8	175
16/06/2017 10:40	1.2	165
16/06/2017 10:50	0.8	110
16/06/2017 11:00	1.4	47
16/06/2017 11:10	1.3	15
16/06/2017 11:20	0.3	175
16/06/2017 11:30	1.2	157
16/06/2017 11:40	1.2	118
16/06/2017 11:50	0.2	109
16/06/2017 12:00	1.2	131
16/06/2017 12:10	2.5	165
16/06/2017 12:20	2.8	166
16/06/2017 12:30	1.7	157
16/06/2017 12:40	1.7	169
16/06/2017 12:50	1.9	143
16/06/2017 13:00	2.6	154
16/06/2017 13:10	1.8	138
16/06/2017 13:20	0.8	117
16/06/2017 13:30	1.1	46
16/06/2017 13:40	1.3	59
16/06/2017 13:50	1.4	76
16/06/2017 14:00	1.3	98
16/06/2017 14:10	1	101
16/06/2017 14:20	1.1	132
16/06/2017 14:30	1.6	145
16/06/2017 14:40	1.1	145
16/06/2017 14:50	1.6	137
16/06/2017 15:00	2.4	156
16/06/2017 15:10	2.2	167
16/06/2017 15:20	2.4	167
16/06/2017 15:30	2.4	152
16/06/2017 15:40	1.8	155
16/06/2017 15:50	1.6	156
16/06/2017 16:00	2.5	167
16/06/2017 16:10	2	165
16/06/2017 16:20	1.2	168
16/06/2017 16:30	1.4	156
16/06/2017 16:40	1.5	170
16/06/2017 16:50	1	178
16/06/2017 17:00	1.8	194
16/06/2017 17:10	2.8	181
16/06/2017 17:20	3.1	169
16/06/2017 17:30	2.5	156
16/06/2017 17:40	2.7	151
16/06/2017 17:50	2.8	149
16/06/2017 18:00	2.5	162
16/06/2017 18:10	2.6	158
16/06/2017 18:20	2.8	151
16/06/2017 18:30	2.8	151
16/06/2017 18:40	2.2	164
16/06/2017 18:50	2.6	153

Date & time	Wind speed (m/s)	Wind Direction (°)
16/06/2017 19:00	2.6	164
16/06/2017 19:10	2	172
16/06/2017 19:20	2	154
16/06/2017 19:30	1.9	141
16/06/2017 19:40	2.7	138
16/06/2017 19:50	2.8	135
16/06/2017 20:00	2.7	135
16/06/2017 20:10	2.9	148
16/06/2017 20:20	2.8	145
16/06/2017 20:30	2.6	155
16/06/2017 20:40	2.4	143
16/06/2017 20:50	2	147
16/06/2017 21:00	1.7	132
16/06/2017 21:10	1.6	119
16/06/2017 21:20	1.8	140
16/06/2017 21:30	1.7	136
16/06/2017 21:40	1.8	119
16/06/2017 21:50	2.4	114
16/06/2017 22:00	2.2	136
16/06/2017 22:10	1.9	157
16/06/2017 22:20	1.7	164
16/06/2017 22:30	1.4	196
16/06/2017 22:40	2	206
16/06/2017 22:50	1.7	199
16/06/2017 23:00	1.3	170
16/06/2017 23:10	1.6	148
16/06/2017 23:20	1.6	123
16/06/2017 23:30	1.7	130
16/06/2017 23:40	2.1	151
16/06/2017 23:50	2.2	150
17/06/2017 0:00	1.5	134
17/06/2017 0:10	1.2	129
17/06/2017 0:20	0.9	131
17/06/2017 0:30	1.1	124
17/06/2017 0:40	2.3	106
17/06/2017 0:50	2	132
17/06/2017 1:00	2.5	163
17/06/2017 1:10	2	186
17/06/2017 1:20	1.3	196
17/06/2017 1:30	2.4	191
17/06/2017 1:40	1.2	160
17/06/2017 1:50	1.2	166
17/06/2017 2:00	2.3	147
17/06/2017 2:10	2.2	144
17/06/2017 2:20	1.8	101
17/06/2017 2:30	1.7	116
17/06/2017 2:40	2	133
17/06/2017 2:50	2.5	147
17/06/2017 3:00	2.5	172
17/06/2017 3:10	1.6	160
17/06/2017 3:20	1.1	123

Date & time	Wind speed (m/s)	Wind Direction (°)
17/06/2017 3:30	1.5	123
17/06/2017 3:40	2.4	127
17/06/2017 3:50	1.9	140
17/06/2017 4:00	2	150
17/06/2017 4:10	1.8	103
17/06/2017 4:20	2.1	172
17/06/2017 4:30	0.7	130
17/06/2017 4:40	1.9	89
17/06/2017 4:50	1.6	129
17/06/2017 5:00	2.1	180
17/06/2017 5:10	1.6	137
17/06/2017 5:20	1.8	79
17/06/2017 5:30	1.3	181
17/06/2017 5:40	1.5	208
17/06/2017 5:50	1.4	197
17/06/2017 6:00	0.3	218
17/06/2017 6:10	0.9	179
17/06/2017 6:20	1.7	192
17/06/2017 6:30	0.5	304
17/06/2017 6:40	0.8	100
17/06/2017 6:50	1	144
17/06/2017 7:00	1	174
17/06/2017 7:10	1	132
17/06/2017 7:20	1.6	178
17/06/2017 7:30	1.9	174
17/06/2017 7:40	2	173
17/06/2017 7:50	1.3	191
17/06/2017 8:00	1.8	147
17/06/2017 8:10	1	160
17/06/2017 8:20	1.2	151
17/06/2017 8:30	1.4	132
17/06/2017 8:40	1	137
17/06/2017 8:50	1.6	154
17/06/2017 9:00	1.8	131
17/06/2017 9:10	1.5	142
17/06/2017 9:20	1.1	152
17/06/2017 9:30	1	164
17/06/2017 9:40	1.1	188
17/06/2017 9:50	1.1	191
17/06/2017 10:00	1.8	185
17/06/2017 10:10	1.7	175
17/06/2017 10:20	1.7	157
17/06/2017 10:30	2.2	148
17/06/2017 10:40	2.5	146
17/06/2017 10:50	2.5	148
17/06/2017 11:00	2.7	150
17/06/2017 11:10	3.5	145
17/06/2017 11:20	3.3	147
17/06/2017 11:30	2.9	141
17/06/2017 11:40	2.5	134
17/06/2017 11:50	2.9	127

Date & time	Wind speed (m/s)	Wind Direction (°)
17/06/2017 12:00	2.2	105
17/06/2017 12:10	1.6	133
17/06/2017 12:20	2.1	145
17/06/2017 12:30	2.8	162
17/06/2017 12:40	3	182
17/06/2017 12:50	2.7	183
17/06/2017 13:00	2.9	184
17/06/2017 13:10	2.7	175
17/06/2017 13:20	3.3	190
17/06/2017 13:30	3.3	184
17/06/2017 13:40	3.5	188
17/06/2017 13:50	3	179
17/06/2017 14:00	3.5	171
17/06/2017 14:10	3.6	177
17/06/2017 14:20	4.1	177
17/06/2017 14:30	3.3	186
17/06/2017 14:40	3.7	194
17/06/2017 14:50	3.6	199
17/06/2017 15:00	3.3	190
17/06/2017 15:10	3.4	194
17/06/2017 15:20	3.7	188
17/06/2017 15:30	2.8	182
17/06/2017 15:40	3	193
17/06/2017 15:50	3.1	184
17/06/2017 16:00	3.3	187
17/06/2017 16:10	3.6	178
17/06/2017 16:20	3.1	179
17/06/2017 16:30	2.9	180
17/06/2017 16:40	2.5	182
17/06/2017 16:50	2.5	187
17/06/2017 17:00	2.2	194
17/06/2017 17:10	2.4	197
17/06/2017 17:20	2.4	196
17/06/2017 17:30	2.2	181
17/06/2017 17:40	2.1	161
17/06/2017 17:50	2	156
17/06/2017 18:00	2.1	166
17/06/2017 18:10	1.7	162
17/06/2017 18:20	1.1	178
17/06/2017 18:30	0.8	152
17/06/2017 18:40	1.2	124
17/06/2017 18:50	2	134
17/06/2017 19:00	1.9	136
17/06/2017 19:10	2	141
17/06/2017 19:20	2.4	138
17/06/2017 19:30	2.3	144
17/06/2017 19:40	2	155
17/06/2017 19:50	1.8	159
17/06/2017 20:00	1.6	147
17/06/2017 20:10	1.7	143
17/06/2017 20:20	2.1	162

Date & time	Wind speed (m/s)	Wind Direction (°)
17/06/2017 20:30	1.5	184
17/06/2017 20:40	1.8	182
17/06/2017 20:50	1.9	158
17/06/2017 21:00	2.3	160
17/06/2017 21:10	2.4	165
17/06/2017 21:20	2.4	164
17/06/2017 21:30	2.2	155
17/06/2017 21:40	2.1	157
17/06/2017 21:50	2.1	155
17/06/2017 22:00	2.5	145
17/06/2017 22:10	2.3	139
17/06/2017 22:20	2.7	137
17/06/2017 22:30	3.3	138
17/06/2017 22:40	3.2	138
17/06/2017 22:50	2.8	141
17/06/2017 23:00	2.9	144
17/06/2017 23:10	2.6	147
17/06/2017 23:20	2.2	142
17/06/2017 23:30	2.3	159
17/06/2017 23:40	2.5	159
17/06/2017 23:50	3.2	159
18/06/2017 0:00	2.9	165
18/06/2017 0:10	3.2	172
18/06/2017 0:20	3.6	176
18/06/2017 0:30	3.9	173
18/06/2017 0:40	4.1	172
18/06/2017 0:50	4.1	176
18/06/2017 1:00	3.7	172
18/06/2017 1:10	3.3	167
18/06/2017 1:20	2.7	157
18/06/2017 1:30	2	140
18/06/2017 1:40	2	123
18/06/2017 1:50	2.2	126
18/06/2017 2:00	1.8	153
18/06/2017 2:10	2	170
18/06/2017 2:20	1.8	171
18/06/2017 2:30	2.5	167
18/06/2017 2:40	2.2	166
18/06/2017 2:50	2.6	167
18/06/2017 3:00	2.9	177
18/06/2017 3:10	3.2	182
18/06/2017 3:20	3.7	177
18/06/2017 3:30	3.2	168
18/06/2017 3:40	3.4	165
18/06/2017 3:50	3	163
18/06/2017 4:00	3.6	163
18/06/2017 4:10	3	158
18/06/2017 4:20	2	137
18/06/2017 4:30	2.5	124
18/06/2017 4:40	2.6	124
18/06/2017 4:50	2.8	126

Date & time	Wind speed (m/s)	Wind Direction (°)
18/06/2017 5:00	2.7	127
18/06/2017 5:10	2.9	132
18/06/2017 5:20	3.2	142
18/06/2017 5:30	3.1	138
18/06/2017 5:40	3.1	144
18/06/2017 5:50	2.3	138
18/06/2017 6:00	2.6	144
18/06/2017 6:10	2.6	153
18/06/2017 6:20	2.7	160
18/06/2017 6:30	2.8	172
18/06/2017 6:40	2.4	179
18/06/2017 6:50	2.8	179
18/06/2017 7:00	3.6	164
18/06/2017 7:10	3.5	165
18/06/2017 7:20	3.3	172
18/06/2017 7:30	4.4	172
18/06/2017 7:40	4.4	172
18/06/2017 7:50	3.7	172
18/06/2017 8:00	3.3	163
18/06/2017 8:10	3.4	170
18/06/2017 8:20	3.3	170
18/06/2017 8:30	3.9	163
18/06/2017 8:40	5.2	155
18/06/2017 8:50	4.9	166
18/06/2017 9:00	4	167
18/06/2017 9:10	3.9	170
18/06/2017 9:20	3.5	167
18/06/2017 9:30	3.2	160
18/06/2017 9:40	3.7	149
18/06/2017 9:50	3.7	143
18/06/2017 10:00	3.3	161
18/06/2017 10:10	3.2	148
18/06/2017 10:20	3.2	150
18/06/2017 10:30	4	148
18/06/2017 10:40	3.5	146
18/06/2017 10:50	3.6	156
18/06/2017 11:00	4.3	157
18/06/2017 11:10	3.3	167
18/06/2017 11:20	2.7	162
18/06/2017 11:30	3.2	160
18/06/2017 11:40	3.2	168
18/06/2017 11:50	3.1	167
18/06/2017 12:00	3.4	192
18/06/2017 12:10	2.7	183
18/06/2017 12:20	3.2	172
18/06/2017 12:30	2.7	181
18/06/2017 12:40	2.7	159
18/06/2017 12:50	3.7	151
18/06/2017 13:00	3.6	162
18/06/2017 13:10	4.7	169
18/06/2017 13:20	5.1	175

Date & time	Wind speed (m/s)	Wind Direction (°)
18/06/2017 13:30	4.9	167
18/06/2017 13:40	4.8	166
18/06/2017 13:50	4.4	176
18/06/2017 14:00	5.2	171
18/06/2017 14:10	5.4	166
18/06/2017 14:20	4.9	172
18/06/2017 14:30	4.8	169
18/06/2017 14:40	5.3	162
18/06/2017 14:50	5.3	171
18/06/2017 15:00	5.1	167
18/06/2017 15:10	5.4	163
18/06/2017 15:20	6	161
18/06/2017 15:30	5.6	167
18/06/2017 15:40	5.8	172
18/06/2017 15:50	5.6	169
18/06/2017 16:00	4.9	171
18/06/2017 16:10	5.1	161
18/06/2017 16:20	4.6	162
18/06/2017 16:30	4	160
18/06/2017 16:40	3.5	162
18/06/2017 16:50	3.2	165
18/06/2017 17:00	2.9	176
18/06/2017 17:10	2.7	181
18/06/2017 17:20	2.8	188
18/06/2017 17:30	2.9	165
18/06/2017 17:40	3.3	161
18/06/2017 17:50	3.1	161
18/06/2017 18:00	2.3	144
18/06/2017 18:10	1.5	148
18/06/2017 18:20	1.1	171
18/06/2017 18:30	0.9	200
18/06/2017 18:40	1.1	178
18/06/2017 18:50	1.9	164
18/06/2017 19:00	2.8	160
18/06/2017 19:10	2.9	164
18/06/2017 19:20	2.6	158
18/06/2017 19:30	2.7	172
18/06/2017 19:40	3.1	175
18/06/2017 19:50	3.3	176
18/06/2017 20:00	2.6	180
18/06/2017 20:10	2	191
18/06/2017 20:20	2	186
18/06/2017 20:30	1.6	183
18/06/2017 20:40	1.6	165
18/06/2017 20:50	2	148
18/06/2017 21:00	2	151
18/06/2017 21:10	1.5	148
18/06/2017 21:20	1.9	157
18/06/2017 21:30	2.3	154
18/06/2017 21:40	2.3	148
18/06/2017 21:50	2.2	144

Date & time	Wind speed (m/s)	Wind Direction (°)
18/06/2017 22:00	2.2	141
18/06/2017 22:10	2.1	146
18/06/2017 22:20	1.2	134
18/06/2017 22:30	0.5	146
18/06/2017 22:40	1.3	140
18/06/2017 22:50	2.3	136
18/06/2017 23:00	2.1	132
18/06/2017 23:10	2.2	135
18/06/2017 23:20	2.1	122
18/06/2017 23:30	2.6	137
18/06/2017 23:40	2.7	151
18/06/2017 23:50	2.9	161
19/06/2017 0:00	2	152
19/06/2017 0:10	2	154
19/06/2017 0:20	1.5	181
19/06/2017 0:30	1.1	193
19/06/2017 0:40	0.6	164
19/06/2017 0:50	1.4	162
19/06/2017 1:00	1.2	130
19/06/2017 1:10	1.1	119
19/06/2017 1:20	1.2	167
19/06/2017 1:30	1.4	165
19/06/2017 1:40	1.2	160
19/06/2017 1:50	1.3	144
19/06/2017 2:00	1.1	148
19/06/2017 2:10	1.3	180
19/06/2017 2:20	1.6	180
19/06/2017 2:30	1.6	176
19/06/2017 2:40	1.6	170
19/06/2017 2:50	1.9	156
19/06/2017 3:00	1.7	129
19/06/2017 3:10	1.9	131
19/06/2017 3:20	1.7	122
19/06/2017 3:30	2.5	133
19/06/2017 3:40	2.7	121
19/06/2017 3:50	2.4	125
19/06/2017 4:00	2.4	144
19/06/2017 4:10	1.7	177
19/06/2017 4:20	1.7	167
19/06/2017 4:30	1.3	183
19/06/2017 4:40	1.1	191
19/06/2017 4:50	1	166
19/06/2017 5:00	1.6	153
19/06/2017 5:10	2.2	165
19/06/2017 5:20	1.8	173
19/06/2017 5:30	1.4	192
19/06/2017 5:40	1	173
19/06/2017 5:50	1.2	145
19/06/2017 6:00	1.8	144
19/06/2017 6:10	2.5	144
19/06/2017 6:20	2.4	147

Date & time	Wind speed (m/s)	Wind Direction (°)
19/06/2017 6:30	1.7	145
19/06/2017 6:40	2	145
19/06/2017 6:50	2	147
19/06/2017 7:00	1.7	152
19/06/2017 7:10	1.5	161
19/06/2017 7:20	0.7	161
19/06/2017 7:30	0.2	159
19/06/2017 7:40	0.6	157
19/06/2017 7:50	1	146
19/06/2017 8:00	1.9	160
19/06/2017 8:10	1	196
19/06/2017 8:20	0.3	213
19/06/2017 8:30	0.5	167
19/06/2017 8:40	1	137
19/06/2017 8:50	1.4	155
19/06/2017 9:00	1.1	169
19/06/2017 9:10	1.7	160
19/06/2017 9:20	1.9	163
19/06/2017 9:30	1.5	157
19/06/2017 9:40	1.5	156
19/06/2017 9:50	1.9	160
19/06/2017 10:00	1.9	152
19/06/2017 10:10	1.6	164
19/06/2017 10:20	1.7	184
19/06/2017 10:30	2	191
19/06/2017 10:40	1.9	202
19/06/2017 10:50	2.2	187
19/06/2017 11:00	2.2	184
19/06/2017 11:10	2.4	181
19/06/2017 11:20	2.2	190
19/06/2017 11:30	2.4	200
19/06/2017 11:40	2.9	226
19/06/2017 11:50	2.4	180
19/06/2017 12:00	2.6	167
19/06/2017 12:10	2.3	160
19/06/2017 12:20	2.5	168
19/06/2017 12:30	2.3	179
19/06/2017 12:40	2.5	207
19/06/2017 12:50	2.9	198
19/06/2017 13:00	3.3	170
19/06/2017 13:10	3.5	167
19/06/2017 13:20	4	169
19/06/2017 13:30	4	172
19/06/2017 13:40	3.8	178
19/06/2017 13:50	3.7	171
19/06/2017 14:00	3.8	173
19/06/2017 14:10	3.6	173
19/06/2017 14:20	3.6	174
19/06/2017 14:30	3.7	175
19/06/2017 14:40	3.6	176
19/06/2017 14:50	4.2	183

Date & time	Wind speed (m/s)	Wind Direction (°)
19/06/2017 15:00	3.4	184
19/06/2017 15:10	3.9	168
19/06/2017 15:20	4.2	158
19/06/2017 15:30	4.3	168
19/06/2017 15:40	4.4	173
19/06/2017 15:50	4	177
19/06/2017 16:00	4	176
19/06/2017 16:10	3.7	179
19/06/2017 16:20	3.1	174
19/06/2017 16:30	3.2	176
19/06/2017 16:40	3.3	177
19/06/2017 16:50	2.8	179
19/06/2017 17:00	2.7	177
19/06/2017 17:10	2.9	178
19/06/2017 17:20	3.2	174
19/06/2017 17:30	3	178
19/06/2017 17:40	3.2	180
19/06/2017 17:50	2.5	180
19/06/2017 18:00	2.6	181
19/06/2017 18:10	2.8	174
19/06/2017 18:20	2.1	163
19/06/2017 18:30	2.2	155
19/06/2017 18:40	2	147
19/06/2017 18:50	2.1	145
19/06/2017 19:00	2.1	150
19/06/2017 19:10	2.5	155
19/06/2017 19:20	2.4	160
19/06/2017 19:30	1.7	169
19/06/2017 19:40	2	160
19/06/2017 19:50	2.1	155
19/06/2017 20:00	1.9	151
19/06/2017 20:10	1.9	158
19/06/2017 20:20	1.9	162
19/06/2017 20:30	2	155
19/06/2017 20:40	2.1	147
19/06/2017 20:50	2.4	153
19/06/2017 21:00	2.7	148
19/06/2017 21:10	2.5	153
19/06/2017 21:20	2.1	155
19/06/2017 21:30	1.8	161
19/06/2017 21:40	1.5	165
19/06/2017 21:50	1.5	149
19/06/2017 22:00	1.8	160
19/06/2017 22:10	2.3	122
19/06/2017 22:20	0.9	77
19/06/2017 22:30	1.3	161
19/06/2017 22:40	1.9	160
19/06/2017 22:50	2.4	165
19/06/2017 23:00	1.7	167
19/06/2017 23:10	0.7	103
19/06/2017 23:20	1.8	160

Date & time	Wind speed (m/s)	Wind Direction (°)
19/06/2017 23:30	2.1	166
19/06/2017 23:40	2.6	156
19/06/2017 23:50	3	153
20/06/2017 0:00	2.9	158
20/06/2017 0:10	3.1	152
20/06/2017 0:20	3	149
20/06/2017 0:30	3	152
20/06/2017 0:40	2.2	159
20/06/2017 0:50	2.2	159
20/06/2017 1:00	2.1	155
20/06/2017 1:10	2.1	161
20/06/2017 1:20	2	169
20/06/2017 1:30	1.3	163
20/06/2017 1:40	1.3	161
20/06/2017 1:50	1.4	163
20/06/2017 2:00	1.6	154
20/06/2017 2:10	1.6	141
20/06/2017 2:20	1.6	131
20/06/2017 2:30	1.7	132
20/06/2017 2:40	1.4	156
20/06/2017 2:50	1.2	165
20/06/2017 3:00	1.3	156
20/06/2017 3:10	0.6	153
20/06/2017 3:20	0.6	164
20/06/2017 3:30	0.7	173
20/06/2017 3:40	0.1	237
20/06/2017 3:50	0.2	176
20/06/2017 4:00	0	170
20/06/2017 4:10	0.3	33
20/06/2017 4:20	0.6	86
20/06/2017 4:30	1	126
20/06/2017 4:40	1	142
20/06/2017 4:50	1.4	152
20/06/2017 5:00	1.7	159
20/06/2017 5:10	0.8	154
20/06/2017 5:20	0.1	152
20/06/2017 5:30	0	239
20/06/2017 5:40	0.7	235
20/06/2017 5:50	0.6	227
20/06/2017 6:00	0.4	237
20/06/2017 6:10	0.1	190
20/06/2017 6:20	0.8	111
20/06/2017 6:30	1.1	138
20/06/2017 6:40	1.3	152
20/06/2017 6:50	1.2	148
20/06/2017 7:00	1.4	141
20/06/2017 7:10	0.9	135
20/06/2017 7:20	0.5	142
20/06/2017 7:30	0.5	148
20/06/2017 7:40	0.8	141
20/06/2017 7:50	1.6	132

Date & time	Wind speed (m/s)	Wind Direction (°)
20/06/2017 8:00	1.2	131
20/06/2017 8:10	1.1	131
20/06/2017 8:20	1.2	148
20/06/2017 8:30	1.2	130
20/06/2017 8:40	1.3	124
20/06/2017 8:50	0.8	120
20/06/2017 9:00	0.5	90
20/06/2017 9:10	0.6	47
20/06/2017 9:20	0.4	22
20/06/2017 9:30	0.6	4
20/06/2017 9:40	0.7	27
20/06/2017 9:50	0.7	81
20/06/2017 10:00	1.1	103
20/06/2017 10:10	1.6	77
20/06/2017 10:20	2.4	45
20/06/2017 10:30	2.7	75
20/06/2017 10:40	3	61
20/06/2017 10:50	3.9	67
20/06/2017 11:00	3.7	58
20/06/2017 11:10	4.3	46
20/06/2017 11:20	3.6	40
20/06/2017 11:30	3.2	50
20/06/2017 11:40	3.4	50
20/06/2017 11:50	2.8	40
20/06/2017 12:00	3.1	37
20/06/2017 12:10	2.7	66
20/06/2017 12:20	2.5	38
20/06/2017 12:30	3.1	78
20/06/2017 12:40	1.5	75
20/06/2017 12:50	2.8	87
20/06/2017 13:00	1.7	118
20/06/2017 13:10	1.3	58
20/06/2017 13:20	3.2	102
20/06/2017 13:30	2	89
20/06/2017 13:40	1.8	108
20/06/2017 13:50	2.5	91
20/06/2017 14:00	2.4	90
20/06/2017 14:10	2.2	115
20/06/2017 14:20	2	110
20/06/2017 14:30	2.4	130
20/06/2017 14:40	2.3	156
20/06/2017 14:50	2.1	132
20/06/2017 15:00	1.8	137
20/06/2017 15:10	2	115
20/06/2017 15:20	3.6	140
20/06/2017 15:30	3.4	161
20/06/2017 15:40	3.3	162
20/06/2017 15:50	3.1	159
20/06/2017 16:00	3.1	154
20/06/2017 16:10	3.6	155
20/06/2017 16:20	4.1	164

Date & time	Wind speed (m/s)	Wind Direction (°)
20/06/2017 16:30	3.7	164
20/06/2017 16:40	3.2	168
20/06/2017 16:50	2.6	167
20/06/2017 17:00	2.8	163
20/06/2017 17:10	2.9	167
20/06/2017 17:20	3	169
20/06/2017 17:30	3.1	169
20/06/2017 17:40	3.1	175
20/06/2017 17:50	3.2	178
20/06/2017 18:00	3.1	171
20/06/2017 18:10	2.4	163
20/06/2017 18:20	2.3	160
20/06/2017 18:30	2.2	161
20/06/2017 18:40	1.8	160
20/06/2017 18:50	1.7	156
20/06/2017 19:00	1.6	144
20/06/2017 19:10	1.6	154
20/06/2017 19:20	1.5	147
20/06/2017 19:30	1.9	131
20/06/2017 19:40	2.1	125
20/06/2017 19:50	2.4	134
20/06/2017 20:00	2.5	142
20/06/2017 20:10	2.3	141
20/06/2017 20:20	2.1	145
20/06/2017 20:30	2	155
20/06/2017 20:40	2	147
20/06/2017 20:50	1.6	134
20/06/2017 21:00	1.9	119
20/06/2017 21:10	2.1	123
20/06/2017 21:20	1.9	125
20/06/2017 21:30	1.6	122
20/06/2017 21:40	1.3	131
20/06/2017 21:50	1.5	152
20/06/2017 22:00	2.2	156
20/06/2017 22:10	2.3	149
20/06/2017 22:20	1.6	137
20/06/2017 22:30	1	126
20/06/2017 22:40	1	120
20/06/2017 22:50	1.3	134
20/06/2017 23:00	1.2	131
20/06/2017 23:10	1.8	133
20/06/2017 23:20	1.8	130
20/06/2017 23:30	1.5	131
20/06/2017 23:40	1	125
20/06/2017 23:50	0.9	135
21/06/2017 0:00	1.5	144
21/06/2017 0:10	1.2	143
21/06/2017 0:20	1.8	138
21/06/2017 0:30	1.4	143
21/06/2017 0:40	0.9	139
21/06/2017 0:50	1.2	138

Date & time	Wind speed (m/s)	Wind Direction (°)
21/06/2017 1:00	1.5	138
21/06/2017 1:10	1.7	143
21/06/2017 1:20	1.8	138
21/06/2017 1:30	1.7	145
21/06/2017 1:40	1.6	154
21/06/2017 1:50	1.7	151
21/06/2017 2:00	1.5	147
21/06/2017 2:10	1.8	152
21/06/2017 2:20	1.8	149
21/06/2017 2:30	1.7	151
21/06/2017 2:40	1.7	166
21/06/2017 2:50	1.1	184
21/06/2017 3:00	0.2	178
21/06/2017 3:10	0.6	213
21/06/2017 3:20	0.5	183
21/06/2017 3:30	0.7	123
21/06/2017 3:40	1	158
21/06/2017 3:50	0.6	161
21/06/2017 4:00	1.6	153
21/06/2017 4:10	2.7	150
21/06/2017 4:20	2.8	153
21/06/2017 4:30	1.4	144
21/06/2017 4:40	1.6	137
21/06/2017 4:50	2.3	135
21/06/2017 5:00	1.5	148
21/06/2017 5:10	1.7	171
21/06/2017 5:20	1.8	159
21/06/2017 5:30	2.3	156
21/06/2017 5:40	1.9	159
21/06/2017 5:50	2.3	155
21/06/2017 6:00	2.2	155
21/06/2017 6:10	1.7	157
21/06/2017 6:20	0.8	211
21/06/2017 6:30	0.5	186
21/06/2017 6:40	1.2	162
21/06/2017 6:50	1.2	161
21/06/2017 7:00	0.4	166
21/06/2017 7:10	1	174
21/06/2017 7:20	0.5	183
21/06/2017 7:30	1	176
21/06/2017 7:40	1.5	150
21/06/2017 7:50	2	144
21/06/2017 8:00	2.2	147
21/06/2017 8:10	2.1	147
21/06/2017 8:20	1.5	157
21/06/2017 8:30	1.4	154
21/06/2017 8:40	1.7	160
21/06/2017 8:50	1.7	154
21/06/2017 9:00	1.5	141
21/06/2017 9:10	2.4	136
21/06/2017 9:20	3.2	138

Date & time	Wind speed (m/s)	Wind Direction (°)
21/06/2017 9:30	3	136
21/06/2017 9:40	3	138
21/06/2017 9:50	3.5	147
21/06/2017 10:00	3.5	151
21/06/2017 10:10	3.6	147
21/06/2017 10:20	3.7	159
21/06/2017 10:30	4.7	157
21/06/2017 10:40	4.6	154
21/06/2017 10:50	4.8	154
21/06/2017 11:00	5.2	151
21/06/2017 11:10	4.7	155
21/06/2017 11:20	4.9	161
21/06/2017 11:30	5.4	154
21/06/2017 11:40	5.1	158
21/06/2017 11:50	5.3	157
21/06/2017 12:00	5.2	161
21/06/2017 12:10	4.8	155
21/06/2017 12:20	4.6	157
21/06/2017 12:30	5.1	165
21/06/2017 12:40	4.9	160
21/06/2017 12:50	4.8	167
21/06/2017 13:00	5.1	157
21/06/2017 13:10	4.9	161
21/06/2017 13:20	5.2	165
21/06/2017 13:30	5.2	159
21/06/2017 13:40	5.4	157
21/06/2017 13:50	4.8	159
21/06/2017 14:00	4.8	152
21/06/2017 14:10	5.2	147
21/06/2017 14:20	5	155
21/06/2017 14:30	4.8	152
21/06/2017 14:40	4.8	161
21/06/2017 14:50	4.2	159
21/06/2017 15:00	3.9	162
21/06/2017 15:10	4	169
21/06/2017 15:20	3.7	165
21/06/2017 15:30	3.9	164
21/06/2017 15:40	4.3	167
21/06/2017 15:50	3.9	165
21/06/2017 16:00	4.1	179
21/06/2017 16:10	3.5	175
21/06/2017 16:20	3.9	172
21/06/2017 16:30	3.8	169
21/06/2017 16:40	3.4	167
21/06/2017 16:50	2.8	170
21/06/2017 17:00	2.9	166
21/06/2017 17:10	2.5	157
21/06/2017 17:20	2.5	159
21/06/2017 17:30	2	153
21/06/2017 17:40	2.2	146
21/06/2017 17:50	2.3	148

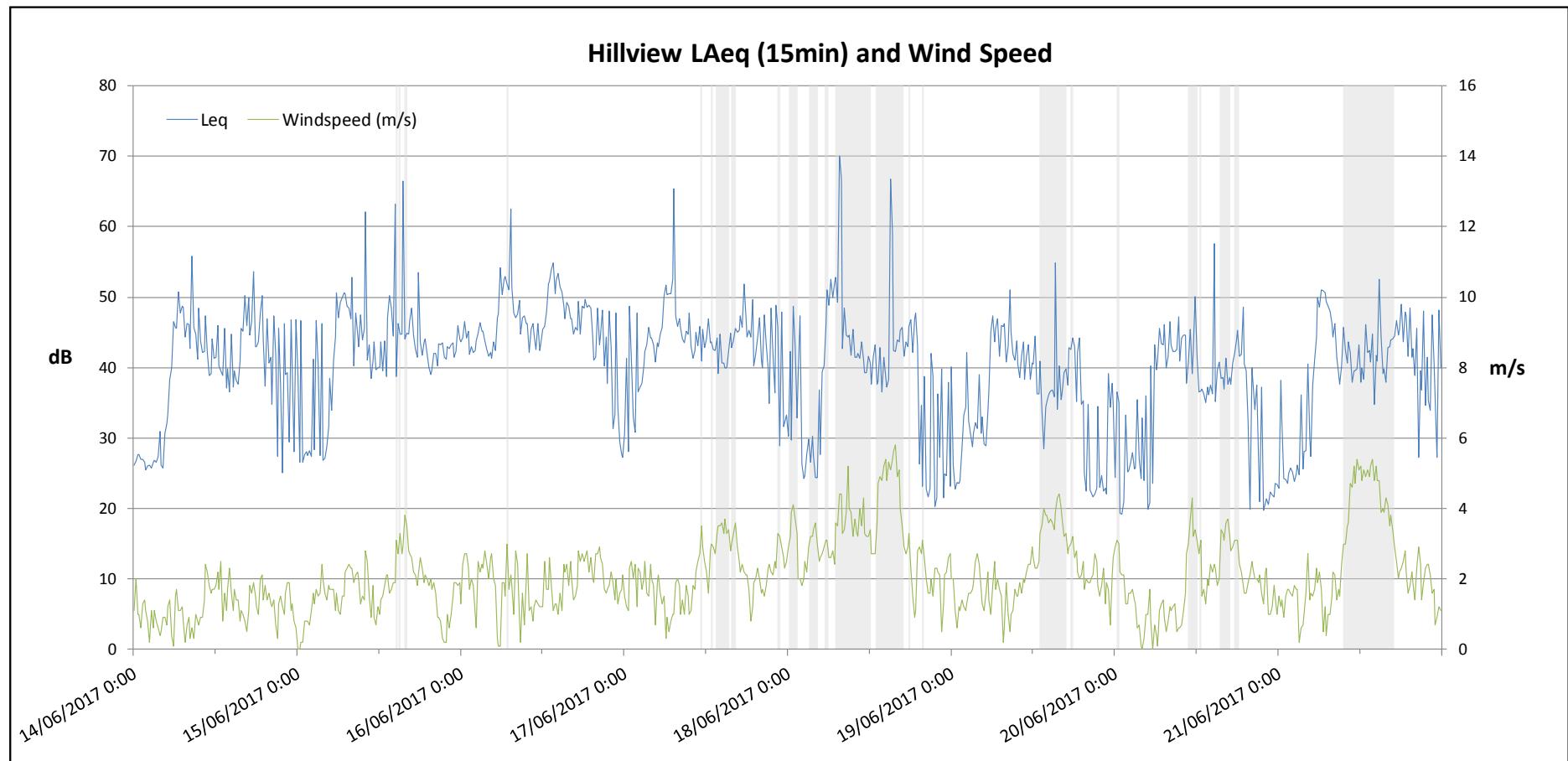
Date & time	Wind speed (m/s)	Wind Direction (°)
21/06/2017 18:00	2.3	140
21/06/2017 18:10	2.5	139
21/06/2017 18:20	3.1	132
21/06/2017 18:30	2.8	126
21/06/2017 18:40	2.2	111
21/06/2017 18:50	1.5	115
21/06/2017 19:00	1.6	127
21/06/2017 19:10	1.8	120
21/06/2017 19:20	2.2	131
21/06/2017 19:30	2.2	140
21/06/2017 19:40	1.9	146
21/06/2017 19:50	2	152
21/06/2017 20:00	1.4	126
21/06/2017 20:10	2.3	143
21/06/2017 20:20	2.9	154
21/06/2017 20:30	2.9	167
21/06/2017 20:40	2.4	173
21/06/2017 20:50	1.8	157
21/06/2017 21:00	1.4	116
21/06/2017 21:10	1.9	141
21/06/2017 21:20	1.9	143
21/06/2017 21:30	2.3	147
21/06/2017 21:40	2.4	148
21/06/2017 21:50	1.5	144
21/06/2017 22:00	2.4	143
21/06/2017 22:10	2.1	126
21/06/2017 22:20	1.7	125
21/06/2017 22:30	1.6	135
21/06/2017 22:40	1.7	164
21/06/2017 22:50	0.9	184
21/06/2017 23:00	0.7	156
21/06/2017 23:10	0.9	140
21/06/2017 23:20	1.5	151
21/06/2017 23:30	1.2	143
21/06/2017 23:40	1.1	125
21/06/2017 23:50	1.1	134

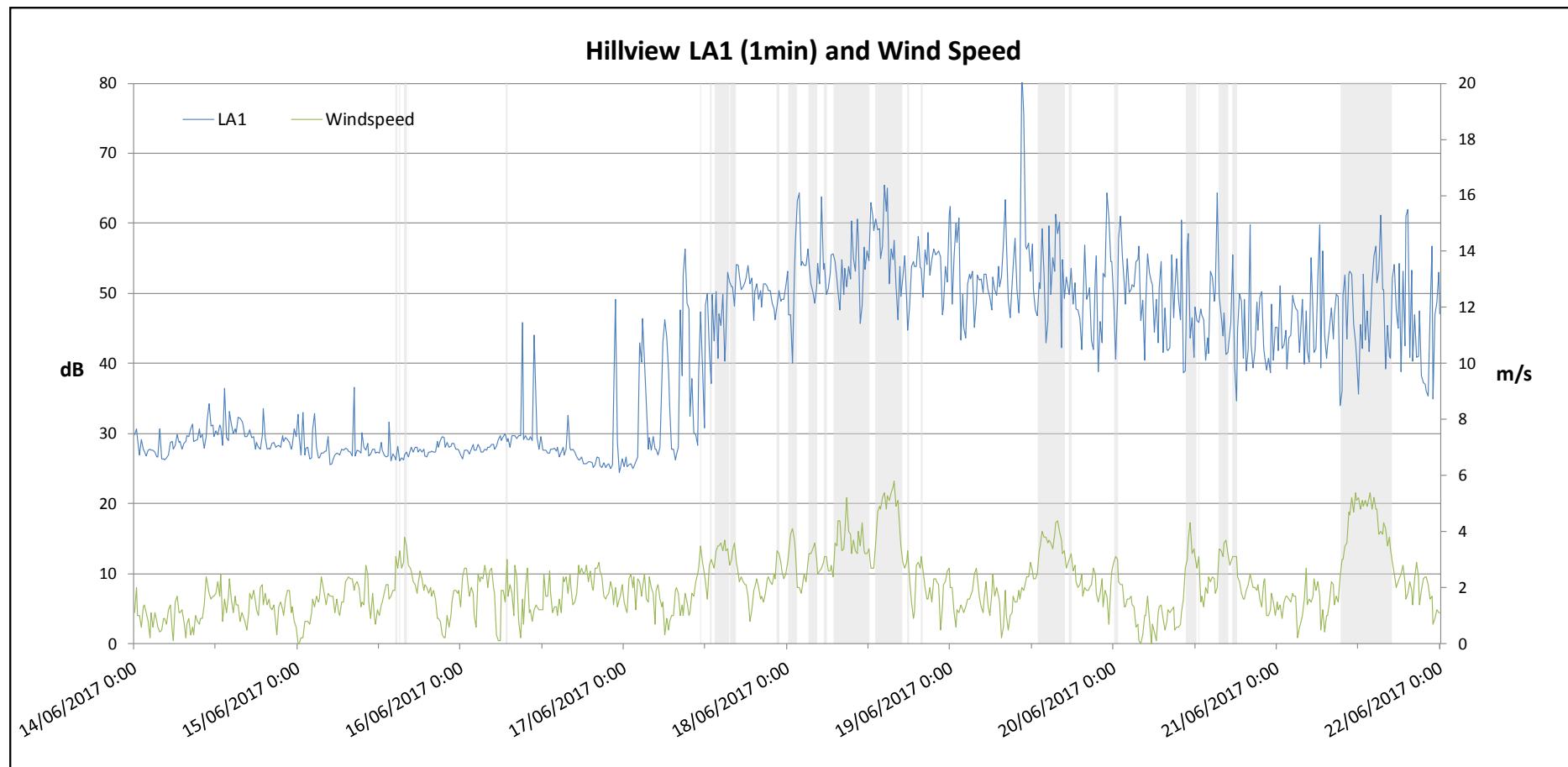
## Appendix D – Full Results Graphs

Note:

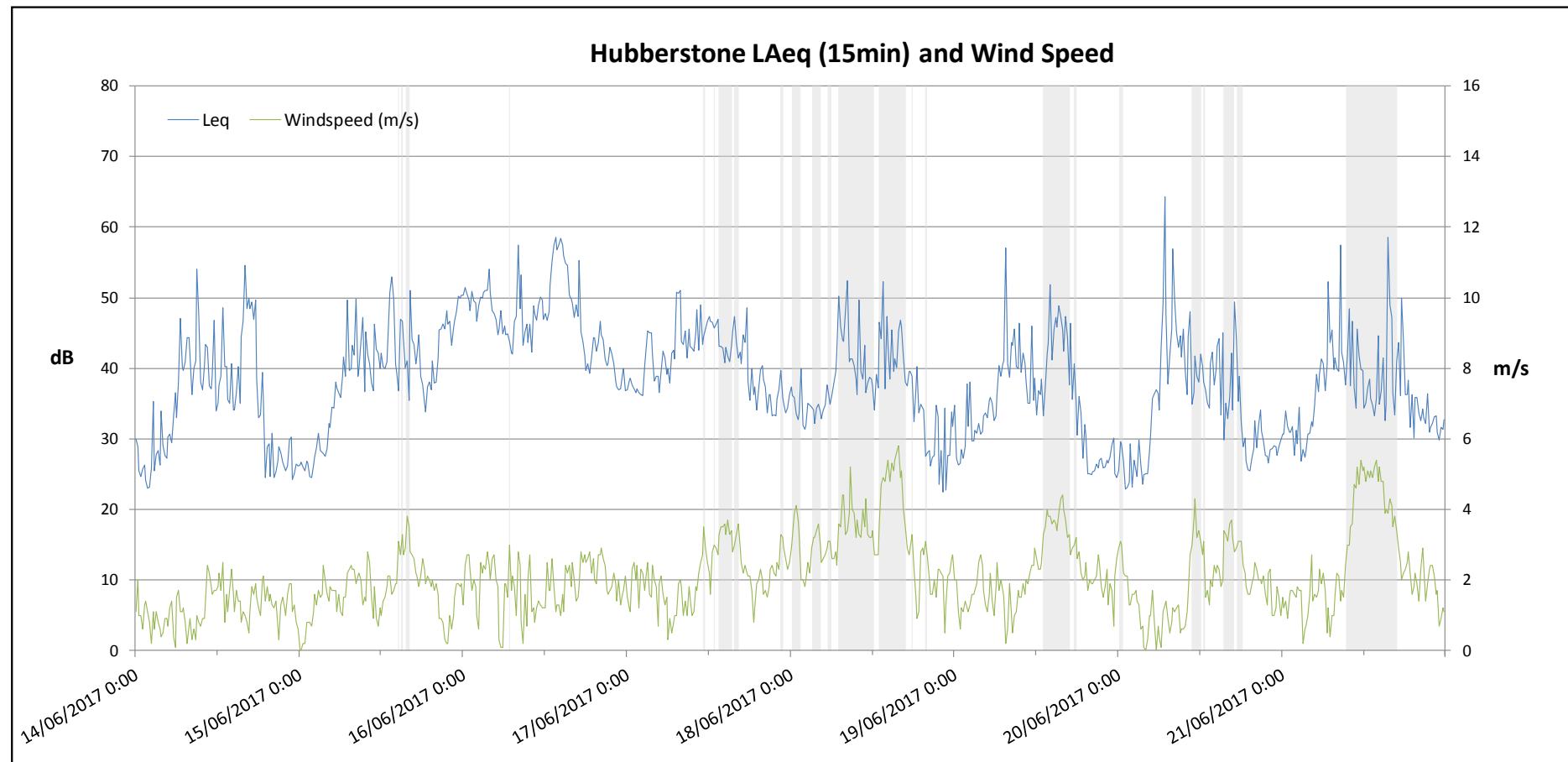
- Grey shaded areas indicate periods when wind speeds were in excess of 3 m/s; data from these periods have been excluded in the calculation for average results presented in Table 7.
- $L_{A1}$  data is only plotted for night periods, which is when the  $L_{A1}$  criteria applies.

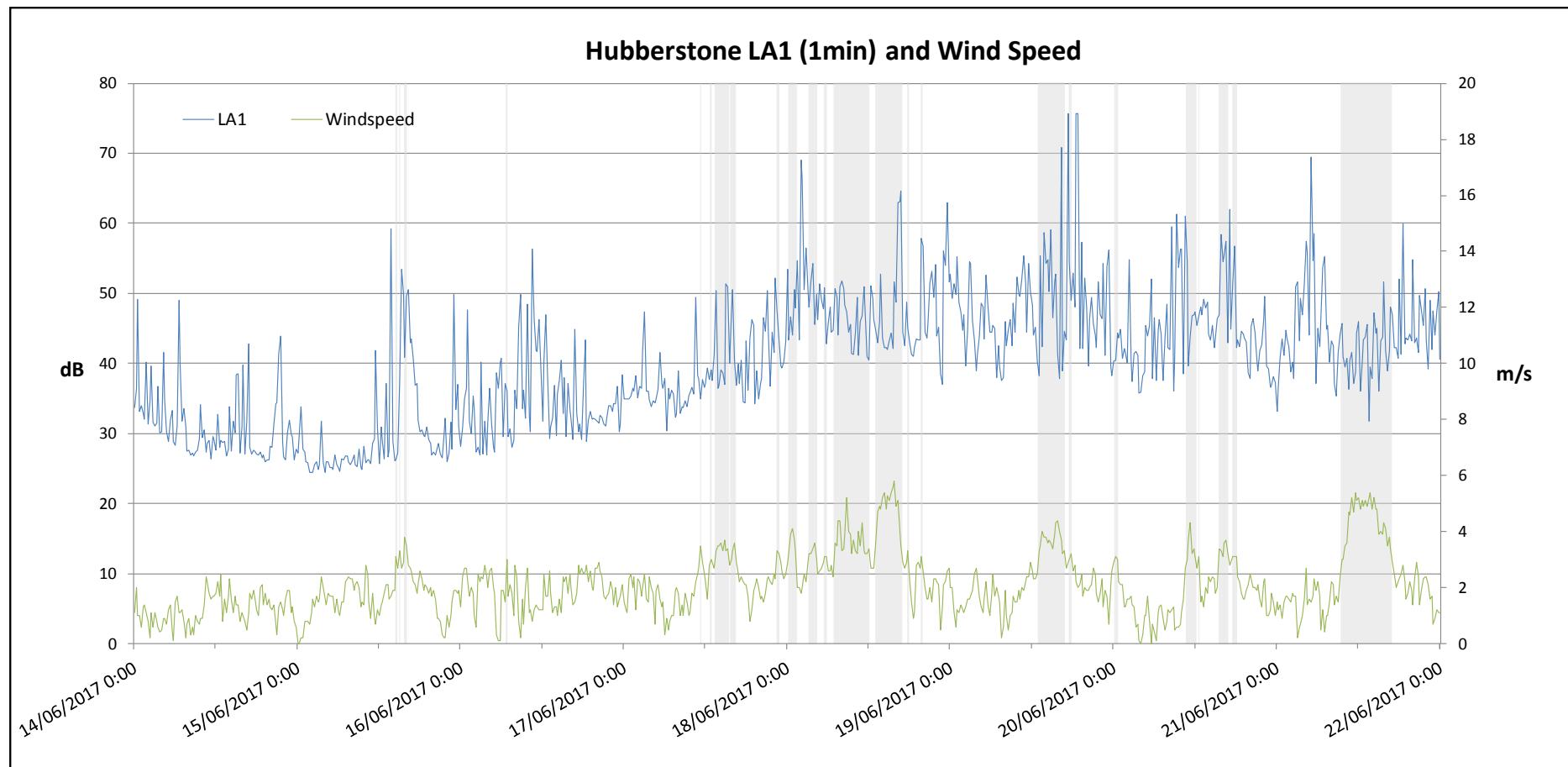
## Hillview



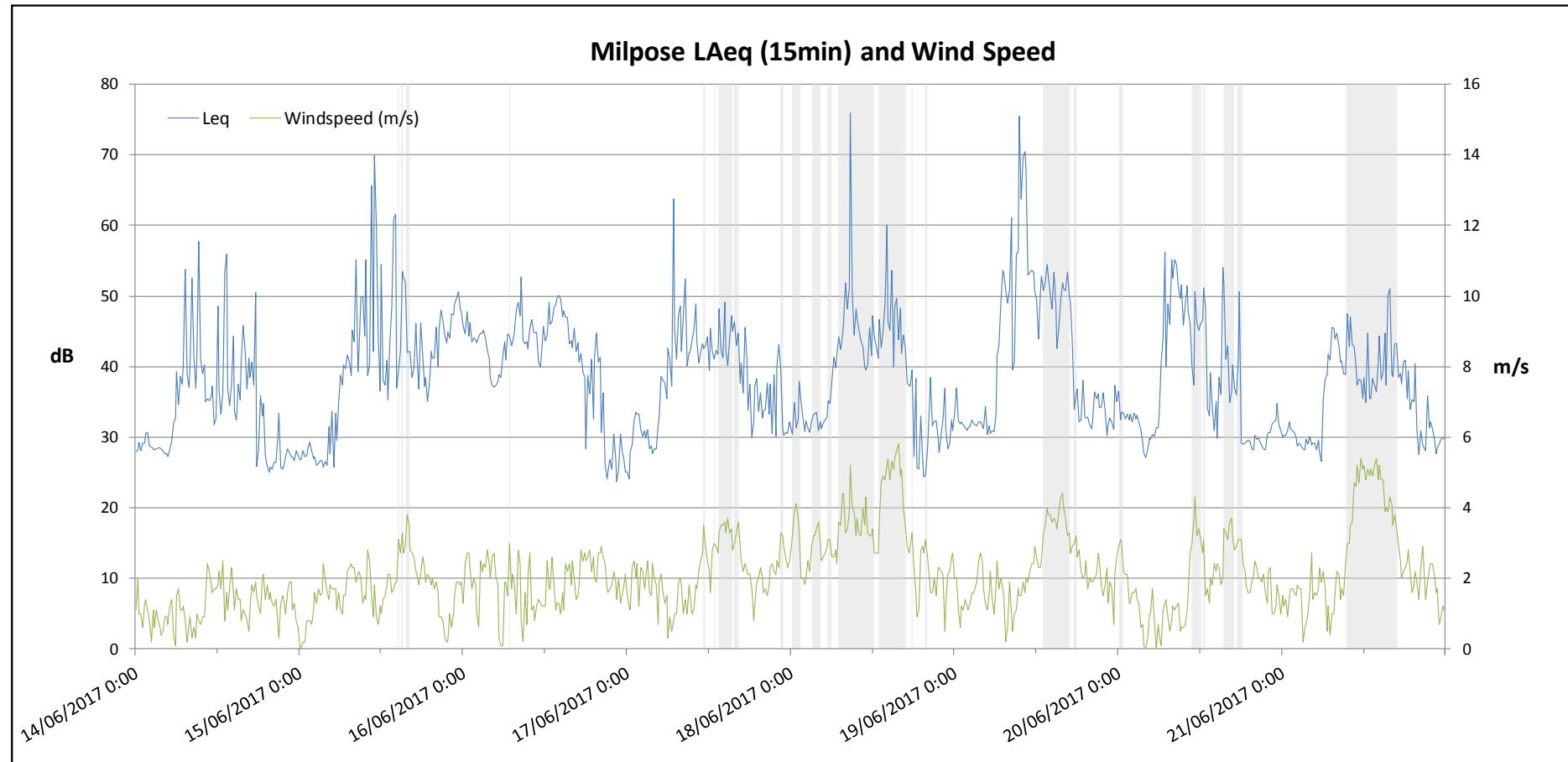


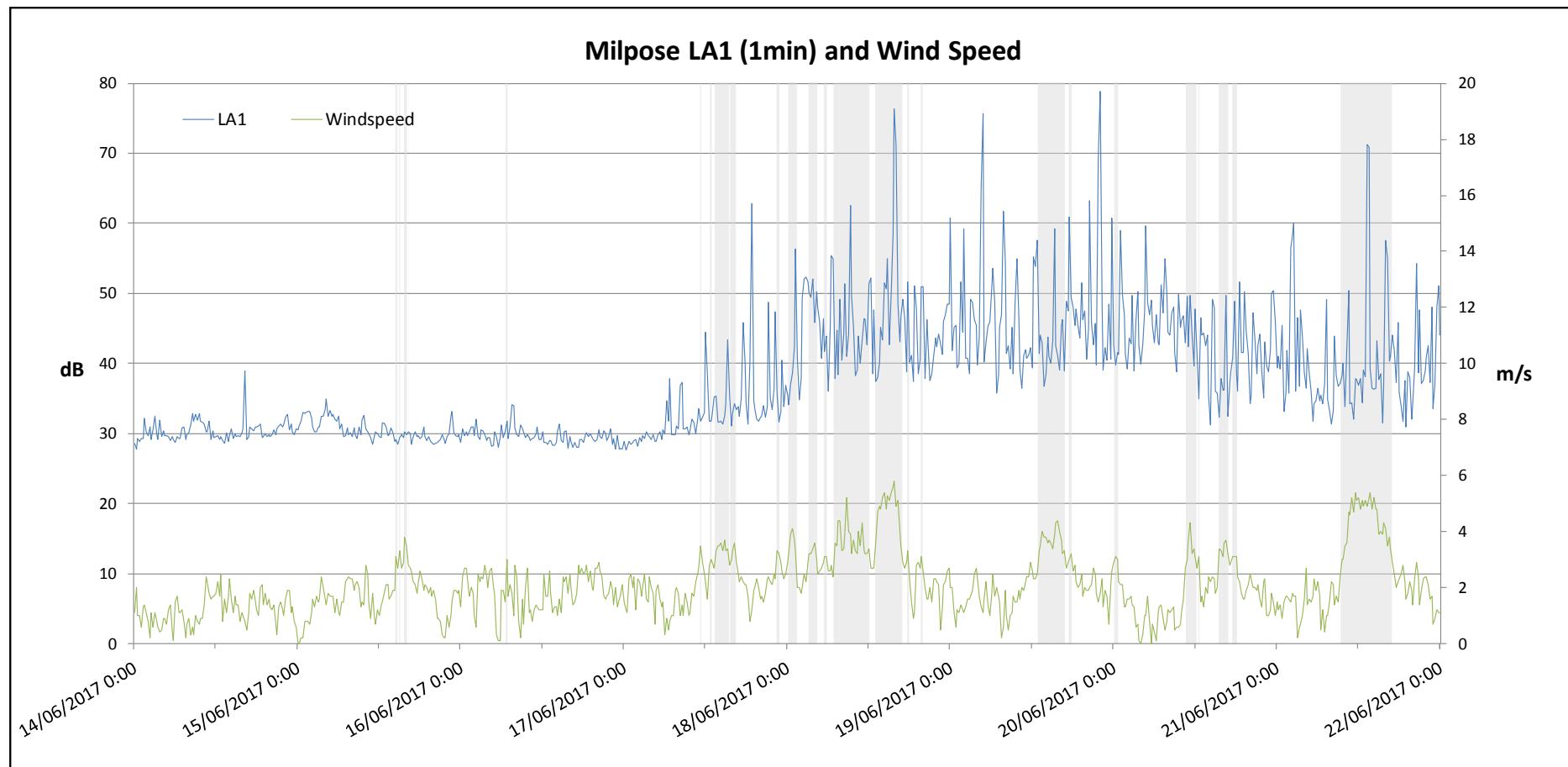
## Hubberstone



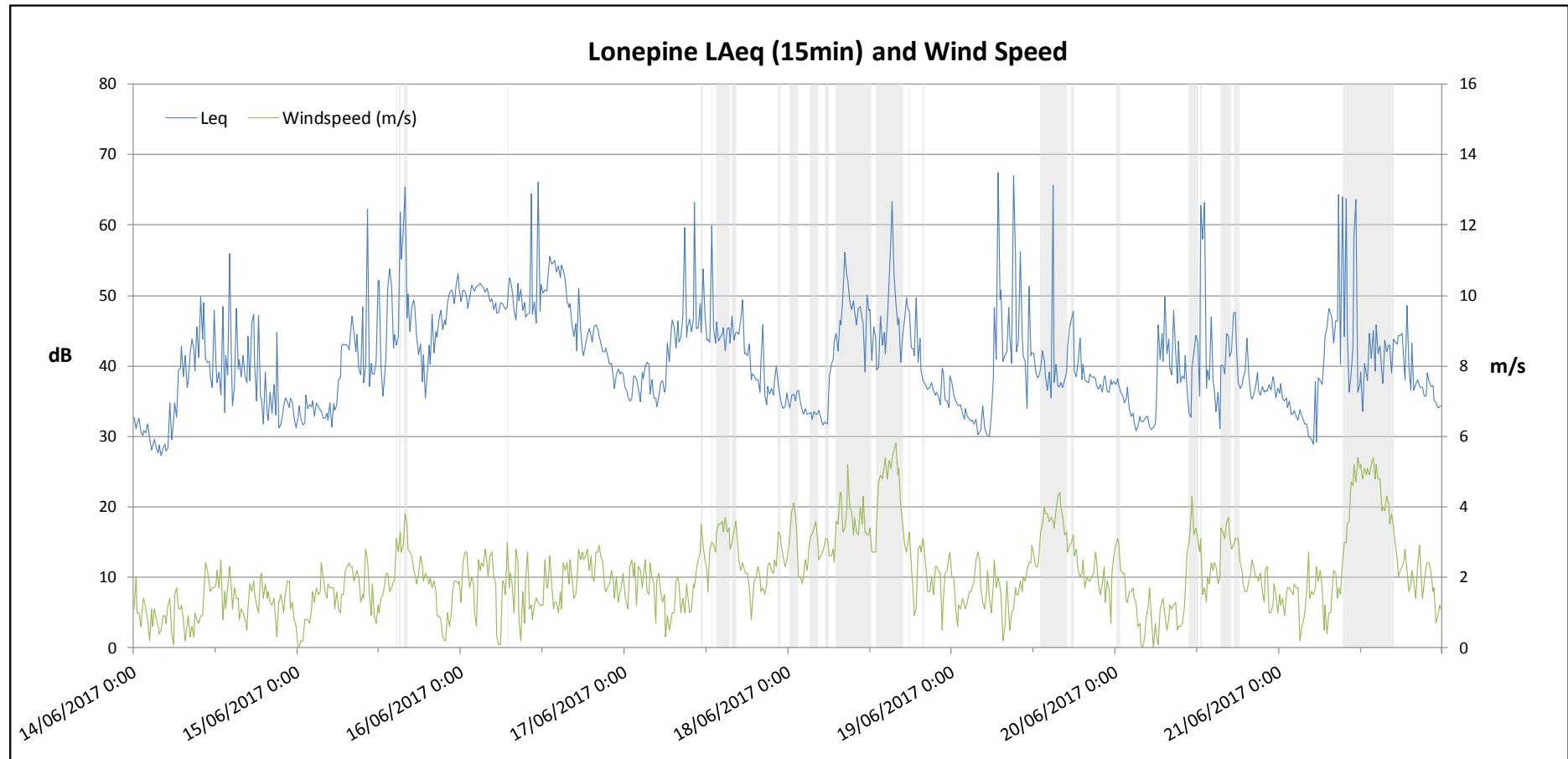


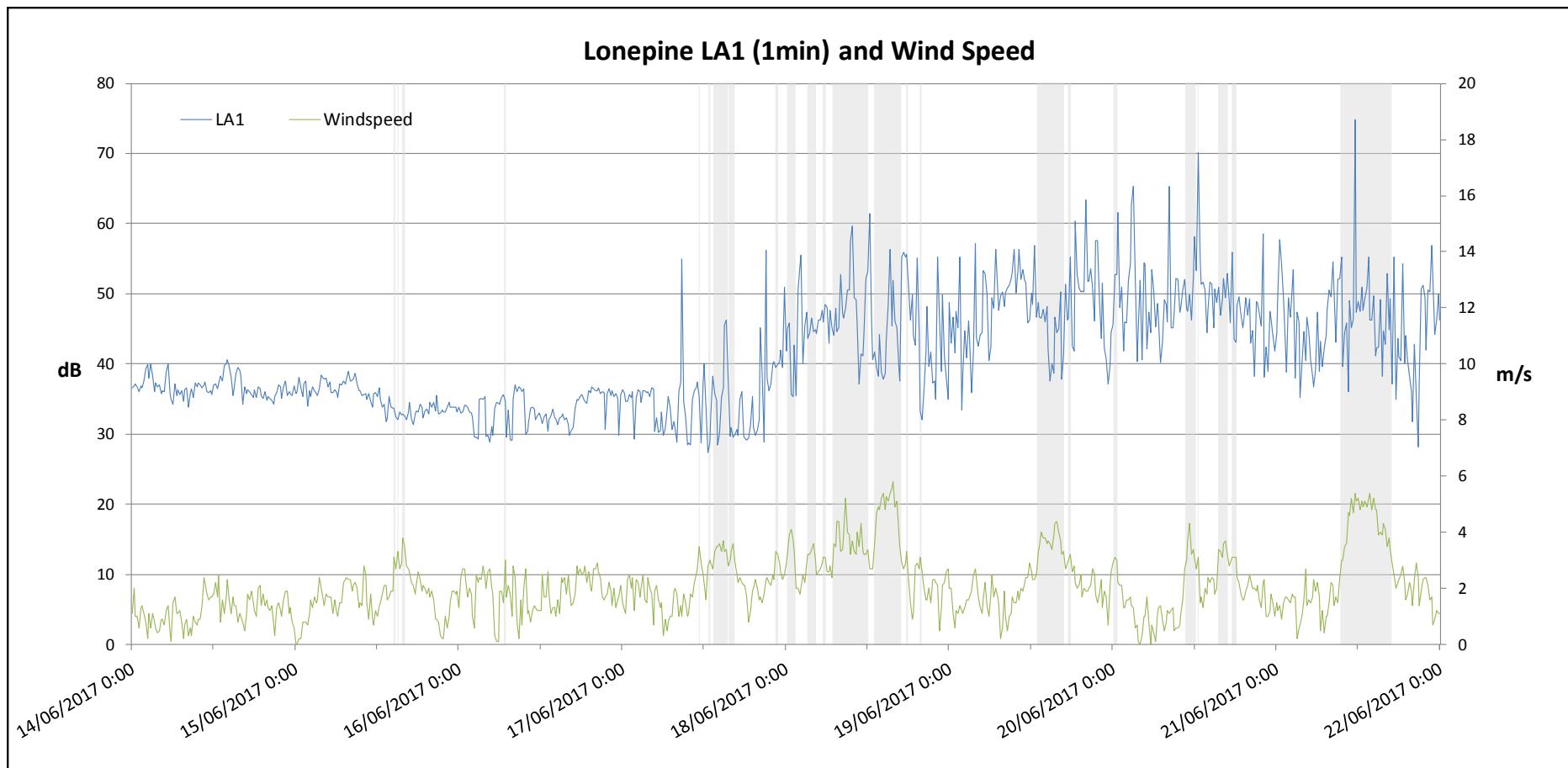
## Milpose





## Lone Pine





*-End of report-*