esp
Environmental &
Safety Professionals

ENVIRONMENTAL NOISE MONITORING
QUARTER 2, 2018

Northparkes Mines
PO Box 995
Parkes NSW 2870

Job No: J38252
Report issued: 11 July 2018

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	*Final version*	*11/7/2018*	*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) all within 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 20th to the 21st of June 2018.

Weather conditions during monitoring were favourable and adequate noise measurements were obtained for this period.

Attended noise monitoring results indicate noise emissions from the mine site comply with the Project Approval criteria during all monitoring periods.

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1. INTRODUCTION

ESP was commissioned by Northparkes Mines (NPM) to undertake an Environmental Noise Assessment during Quarter 2, 2018 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 20th to the 21st June 2018;
- an assessment of the results against Project Approval 11_0060 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 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.

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.

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.". It is noted that during Q2 monitoring, no excessive wind speeds were recorded and no results required adjustment due to extraneous noise.

Location	Date and Time	L_{A1} dB	L_{A10} dB	L_{Aeq} dB	L_{A90} dB	Compliance?	Notes
Hillview	20/06/2018 13:32	37.6	32.4	**30.1**	24.4	Yes	
	20/06/2018 13:48	40.9	33.6	**32.9**	24.1	Yes	Bird noise Wind gusts Mine not audible
	20/06/2018 14:07	35.0	30.3	**28.2**	28.2	Yes	
Hubberstone	20/06/2018 15:32	42.0	34.5	**32.0**	25.7	Yes	
	20/06/2018 15:46	38.6	32.3	**30.0**	24.2	Yes	Bird noise Mine not audible
	20/06/2018 16:01	30.9	32.9	**30.4**	26.1	Yes	
Milpose	20/06/2018 17:15	34.4	28.2	**25.3**	16.8	Yes	
	20/06/2018 17:30	31.5	26.8	**23.3**	17.0	Yes	Dog barking Mine not audible
	20/06/2018 17:45	33.5	25.4	**23.0**	15.2	Yes	
Lonepine	20/06/2018 14:20	46.2	32.5	**34.1**	26.2	Yes	
	20/06/2018 14:35	42.3	33.4	**32.2**	27.1	Yes	Dog barking Bird noise Mine not audible
	20/06/2018 14:50	38.4	34.8	**32.4**	27.2	Yes	

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	20/06/2018 19:25	28.6	23.7	**19.7**	13.9	Yes	
	20/06/2018 19:41	28.3	18.3	**18.9**	13.6	Yes	Mine not audible
	20/06/2018 19:56	25.6	20.7	**17.7**	13.8	Yes	
Hubberstone	21/06/2018 19:53	27.4	19.5	**19.5**	16.4	Yes	
	21/06/2018 20:13	27.5	21.9	**21.4**	18.5	Yes	Mine not audible
	21/06/2018 20:30	28.0	22.8	**22.4**	17.7	Yes	
Milpose	20/06/2018 18:02	33.4	24.7	**23.3**	16.2	Yes	
	20/06/2018 18:18	32.5	35.2	**23.1**	18.2	Yes	Dogs barking Mine not audible
	20/06/2018 18:35	36.7	27.9	**25.5**	17.1	Yes	
Lonepine	21/06/2018 21:13	32.2	23.7	**21.5**	13.7	Yes	
	21/06/2018 21:30	36.7	26.8	**24.5**	14.5	Yes	Mine not audible
	21/06/2018 21:45	35.1	24.0	**24.0**	15.0	Yes	

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	21/06/2018 0:40	**33.9**	29.8	**26.7**	21.4	Yes	
	21/06/2018 0:55	**32.0**	27.3	**24.6**	19.8	Yes	Mine not audible
	21/06/2018 1:10	**31.6**	27.5	**25.5**	22.7	Yes	
Hubberstone	21/06/2018 1:35	**31.3**	26.5	**26.1**	23.2	Yes	
	21/06/2018 1:50	**31.2**	28.2	**26.3**	23.2	Yes	Mine barely audible
	21/06/2018 2:05	**30.5**	27.6	**25.9**	22.7	Yes	
Milpose	21/06/2018 23:27	**27.5**	24.6	**22.6**	19.5	Yes	
	21/06/2018 23:42	**32.2**	27.2	**25.4**	22.1	Yes	Mine not audible
	21/06/2018 23:57	**32.7**	27.3	**24.9**	19.5	Yes	
Lonepine	21/06/2018 22:35	**33.8**	18.2	**21.9**	14.0	Yes	
	21/06/2018 22:50	**28.0**	18.8	**18.4**	15.0	Yes	Mine not audible
	21/06/2018 23:05	**29.1**	19.2	**19.1**	15.2	Yes	

Table 6: Night Attended Noise Results

5. DISCUSSION

Measurements indicate compliance with the 15-minute L_{Aeq} limitation of 35 dB at all locations during conforming weather conditions.

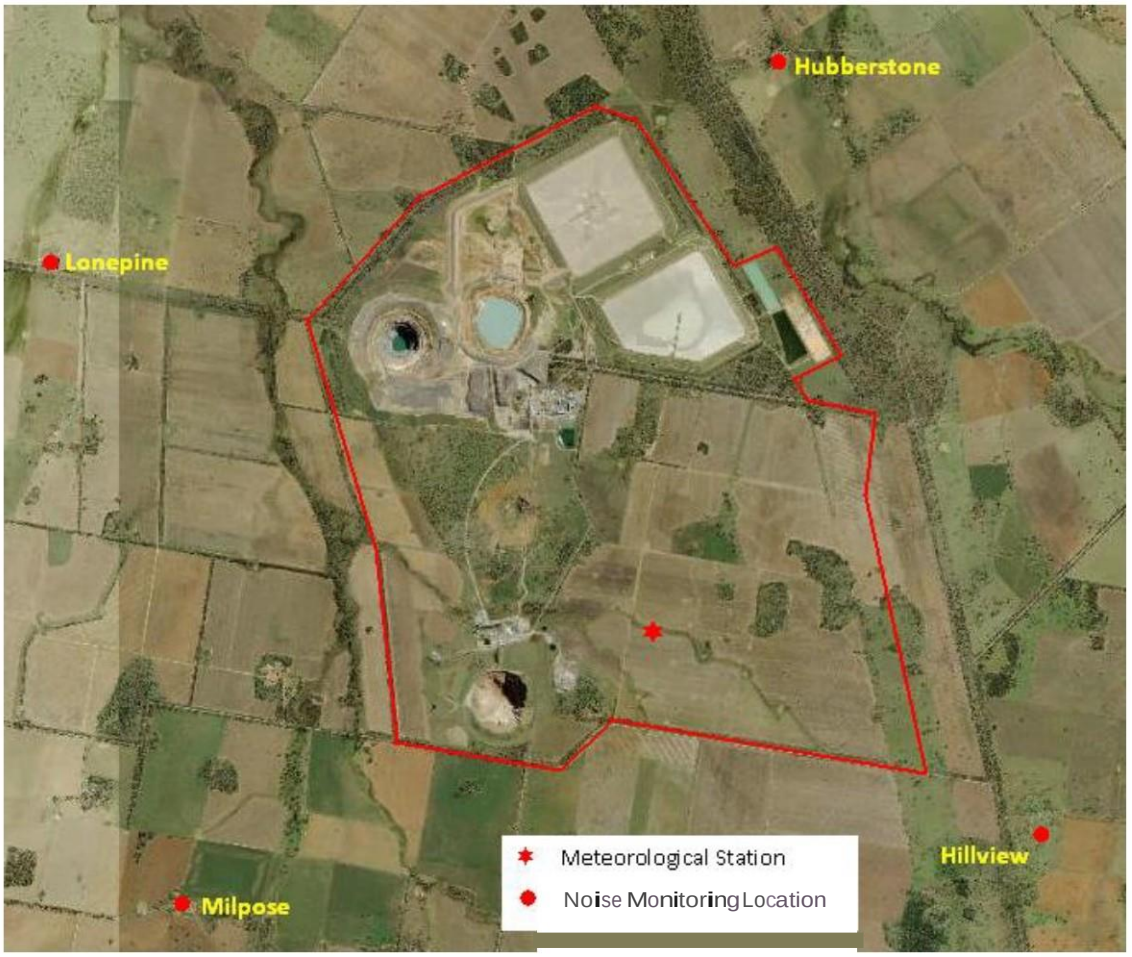
Where possible, extraneous noise sources have been excluded from attended measurements by pausing the sound level meter when non-NPM sources predominate (e.g. passing traffic or aircraft) and/or subtracting the component of the frequency spectrum that is caused by non-NPM sources (e.g. wildlife noise,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

6. CONCLUSION

Attended environmental noise monitoring was conducted at four noise sensitive receivers around adjacent properties to Northparkes Mine site from the 20th to the 21st June 2018.

Attended noise monitoring results indicate noise emissions from the mine site comply with the Project Approval criteria.

Appendix A- Map of Monitoring Locations



Appendix B- Equipwment Calibration Details

ACCIUJsitoc !R St!ta'IIJ"C&l1 lLillbs Ptv Ltd

Level7 Building2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
Ph: +612 9484o8oo A.B.N. 65:1.6o 3991.:1.9
www.acousticresearch.com.au

Sound Level Meter

IEC 61672-3.2013

Calibration Certificate

Cnlibrtion Number Cl7244

Client Details ESP Environmental & Safety Professionals
Unit 2, 28 Parker Street
FOOTSCRAY VIC 301 1

Equipment Tested/ Model Number : Rion NL-52EX
Instrument Serial Number : *0031S60S*
Microphone Serial Number : 11074
Pre-amplifier Serial Number : 65732

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature:	22.1°C	Ambient Tempernture:	22.2°C
Relotivc Humidity:	53.1%	Relati ve Humidity:	53.1%
Barometric rressut-e :	99.31 kPn	Ba rometric Pressure :	99.29kPa

Calibrntion Technician : Vicky Jaiswal
Calibration Date : 24/0512017

Secondary Check: Sandra Minto
2 4 /05/2017

Approved Sign: tory : Ken Williams

Clause nd Chn roeteri.stic Tested	Result	Clause nnd Chnracteristic Tested	Result
12: Acoustical Sig.tests of a frequency weighting	*Pas.s*	17: Level linearity incl. the level range control	*Pass*
13: Elcctricnl Sig. tests of frequency wei htings	*Pass*	18:Toneburst response	*Po:ss*
14: Frequency and time weightings at I KHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
I!i: Long Tcm1 Stability	*Pass*	20: Olerload Indication	*Po:ss*
16: Level linearity on the n:fcn:ncc: lc:vc:l mngc	*Pass*	21: High Level Stability	*Pass*

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11.SkH:>	*±0.2d8*	Re/olhoe *HIUmdu)l*	*MI.46Y.*
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Acoustic Resch Labs Pty Ud is NATA Acrndlled Laboratol)' Number 1<1172.
Accredited for compliatlce \'lith JSO/JEC 17025.

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Acoustic Research Labs Pty Ltd
Level7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 21.20
Ph: +61 2 9484 0800 A.B.N.65160 399 ug
www.acousticresearch.com.au

Octave Band Filter

AS 4476:1997

Calibration Certificate

Calibr2tlon Number Cl7244A

Clleol Details ESP Environmental & Safety Professionals
Unit 2, 2B Parker Street
FOOTSCRAY VIC 301 I

Filter Modo:l Number: Rion NL-52EX
Filter Serial Number: *NJA*
Instrument Serial Number : 00375605
1.\'llc:rophone Serial Number : 11074
P1·e-amplifler Se.rinl Number : 65732

Atmospheric Conditior s
Ambient Tempe.-:1ture : 21.8°C
Relative Humidity : 49.J%
B11a·ometric Pressure : 99.27kPa

CaUbrntlon T hnicinn : Vicky Jaiswal
Callllratioo Da1e: 24/05/2017
Secondary Che:ck: Sandra Minto
Report Isnac Date: 24/05/2017

Approved Signatory : Ken Wiltiams

Ciau.,;e1a1rl Characteristic Tested	Result	Clause 11nd Characteristic Tested	Result
4.4 & 5.3: Ill Ocl!lve relative attenuation	*Pass*	4.6 & 5.5: Linear operating range	*Pa.u*
4.4 & 5.3: 1/3 Oct11vo relative attenuation	*Pa:rs*	4.8 & 5.7: Anli-al!as filters	*PIISS*
		4.I0 & 5.9:Flat frequency response	*Pass*

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NATA is a signatory to the JLAC Mutual Rccognitioo Ammgement for the muru11.l recog,nltl.on of the cqulvalenoc Q(toa, medical testing, libnU.JoD ll!ld inspection n:p«U.

NATA
WORLD RECOGNISED ACCREDITATION

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Appendix C – Weather Conditions during Monitoring Period

Note: Data provided by Northparkes Mine.

Wind-Rose

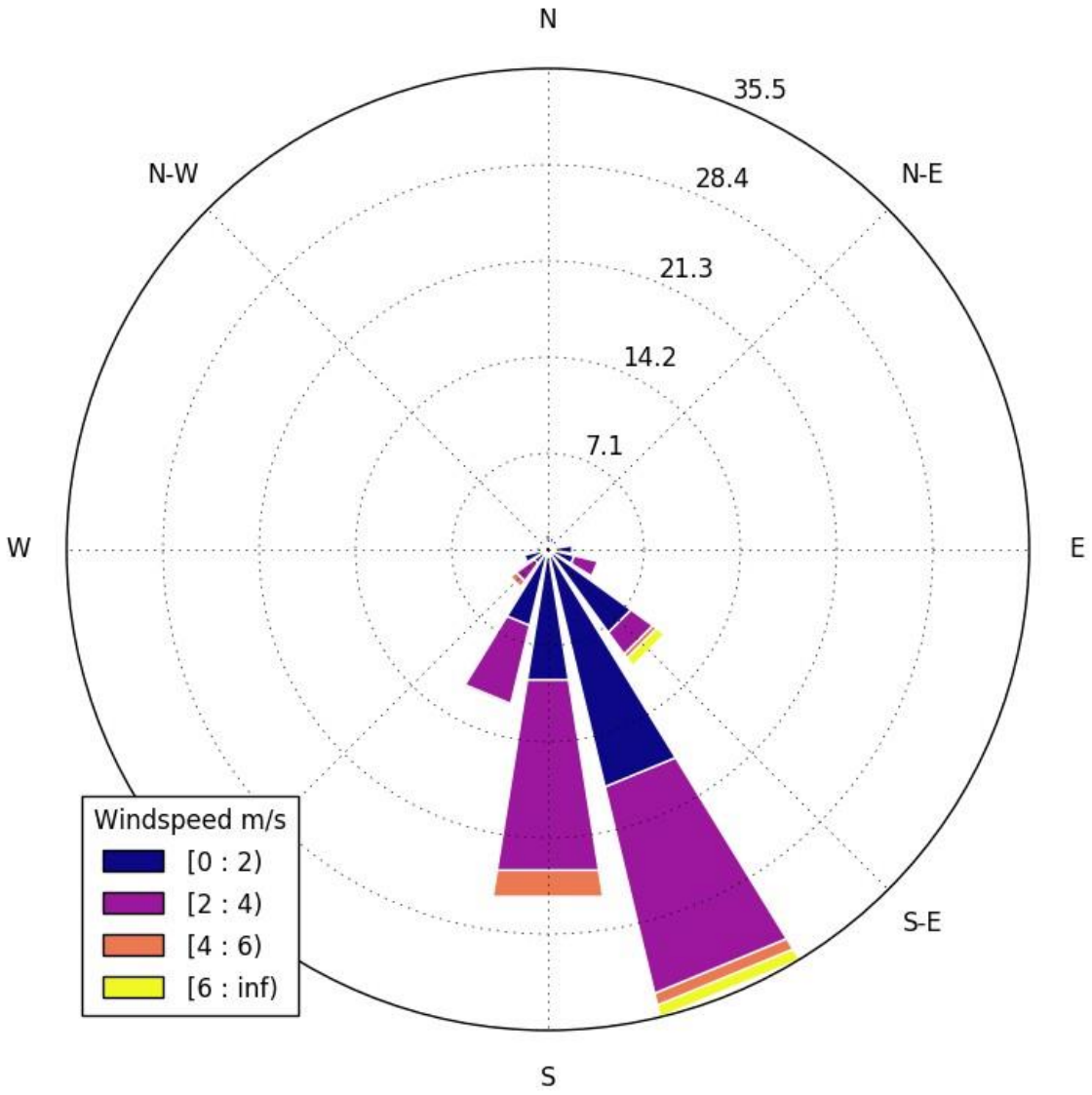

Figure 1 - Wind rose for period 20/06/2018 – 22/05/2018

Tabulated Meteorological Conditions

Date & time	Wind speed (m/s)	Wind Direction (°)
19/06/2018 0:00	1.969	198.1
19/06/2018 0:10	1.238	188.2
19/06/2018 0:20	1.625	197.1
19/06/2018 0:30	1.606	196.5
19/06/2018 0:40	1.875	196.8
19/06/2018 0:50	1.651	187.8
19/06/2018 1:00	2.415	211.7
19/06/2018 1:10	2.266	205.4
19/06/2018 1:20	2.238	200
19/06/2018 1:30	1.977	202.4
19/06/2018 1:40	1.854	182.9
19/06/2018 1:50	1.538	198.7
19/06/2018 2:00	2.085	213.6
19/06/2018 2:10	2.486	223.5
19/06/2018 2:20	2.274	206.1
19/06/2018 2:30	2.292	220.1
19/06/2018 2:40	2.247	216.1
19/06/2018 2:50	2.538	220.7
19/06/2018 3:00	2.268	195.6
19/06/2018 3:10	2.23	164.1
19/06/2018 3:20	2.236	148.2
19/06/2018 3:30	2.405	122.1
19/06/2018 3:40	1.83	140.6
19/06/2018 3:50	1.616	163.2
19/06/2018 4:00	1.393	168.4
19/06/2018 4:10	1.763	147.3
19/06/2018 4:20	2.254	151.9
19/06/2018 4:30	1.889	166.5
19/06/2018 4:40	2.452	166.2
19/06/2018 4:50	2.379	176
19/06/2018 5:00	2.113	187.1
19/06/2018 5:10	1.559	207.6
19/06/2018 5:20	1.634	187.8
19/06/2018 5:30	1.834	182
19/06/2018 5:40	2.255	187.6
19/06/2018 5:50	1.917	189.8
19/06/2018 6:00	2.355	173.2
19/06/2018 6:10	2.129	177.4
19/06/2018 6:20	2.206	200.2
19/06/2018 6:30	3.307	192.3
19/06/2018 6:40	3.293	181.2
19/06/2018 6:50	3.87	176.3
19/06/2018 7:00	3.371	175.1
19/06/2018 7:10	4.314	186.5
19/06/2018 7:20	3.259	181.5
19/06/2018 7:30	3.462	178.4
19/06/2018 7:40	3.445	188.7
19/06/2018 7:50	3.385	189

Date & time	Wind speed (m/s)	Wind Direction (°)
19/06/2018 8:00	3.629	188.2
19/06/2018 8:10	3.582	183.8
19/06/2018 8:20	3.923	175.6
19/06/2018 8:30	3.982	174.1
19/06/2018 8:40	3.997	180.2
19/06/2018 8:50	3.838	178.1
19/06/2018 9:00	4.557	180.2
19/06/2018 9:10	3.832	191.7
19/06/2018 9:20	3.965	192.1
19/06/2018 9:30	4.809	172.5
19/06/2018 9:40	5.211	172.9
19/06/2018 9:50	4.322	175.8
19/06/2018 10:00	4.144	173.8
19/06/2018 10:10	4.604	170.5
19/06/2018 10:20	3.072	177.5
19/06/2018 10:30	4.369	174
19/06/2018 10:40	4.813	175.3
19/06/2018 10:50	5.082	172
19/06/2018 11:00	5.299	164.2
19/06/2018 14:30	6.736	139.3
19/06/2018 14:40	6.959	137.2
19/06/2018 14:50	6.316	147.6
19/06/2018 15:00	7.096	139.2
19/06/2018 15:10	6.333	148.6
19/06/2018 15:20	6.771	156.1
19/06/2018 15:30	7.161	154.4
19/06/2018 15:40	6.092	157.7
19/06/2018 15:50	6.672	145.3
19/06/2018 16:00	5.541	143.5
19/06/2018 16:10	5.463	150.7
19/06/2018 16:20	5.458	154.1
19/06/2018 16:30	4.932	155.5
19/06/2018 16:40	4.253	167.4
19/06/2018 16:50	4.079	175.7
19/06/2018 17:00	3.624	176
19/06/2018 17:10	2.881	182.8
19/06/2018 17:20	2.581	186.3
19/06/2018 17:30	2.572	185
19/06/2018 17:40	2.471	187.9
19/06/2018 17:50	1.743	193.2
19/06/2018 18:00	1.559	189.4
19/06/2018 18:10	2.021	188.3
19/06/2018 18:20	2.498	176.6
19/06/2018 18:30	3.097	174.5
19/06/2018 18:40	2.781	178.8
19/06/2018 18:50	2.584	175.2
19/06/2018 19:00	1.964	171.8
19/06/2018 19:10	2.074	172.9

Date & time	Wind speed (m/s)	Wind Direction (°)
19/06/2018 19:20	1.841	174.3
19/06/2018 19:30	1.985	181.8
19/06/2018 19:40	2.353	190.8
19/06/2018 19:50	2.39	192.9
19/06/2018 20:00	2	202.2
19/06/2018 20:10	1.717	207.4
19/06/2018 20:20	2.348	208
19/06/2018 20:30	2.182	201
19/06/2018 20:40	2.353	204.1
19/06/2018 20:50	1.864	201.5
19/06/2018 21:00	1.117	198.9
19/06/2018 21:10	1.401	206.5
19/06/2018 21:20	1.302	179
19/06/2018 21:30	1.966	153.4
19/06/2018 21:40	2.517	175.6
19/06/2018 21:50	2.62	174.1
19/06/2018 22:00	2.852	172.3
19/06/2018 22:10	2.168	178.4
19/06/2018 22:20	1.973	181.6
19/06/2018 22:30	1.91	172.3
19/06/2018 22:40	1.885	168.8
19/06/2018 22:50	1.98	162
19/06/2018 23:00	1.312	134.5
19/06/2018 23:10	1.059	91
19/06/2018 23:20	1.407	119
19/06/2018 23:30	2.238	150.8
19/06/2018 23:40	2.993	151.6
19/06/2018 23:50	2.321	152.3
20/06/2018 0:00	2.181	147.5
20/06/2018 0:10	2.548	154.2
20/06/2018 0:20	3.233	156.4
20/06/2018 0:30	3.136	152.4
20/06/2018 0:40	3.714	149.5
20/06/2018 0:50	3.892	149.5
20/06/2018 1:00	3.835	154.7
20/06/2018 1:10	3.918	157
20/06/2018 1:20	3.93	155.3
20/06/2018 1:30	3.553	153.6
20/06/2018 1:40	2.097	141.2
20/06/2018 1:50	2.328	141.2
20/06/2018 2:00	3.831	137.3
20/06/2018 2:10	4.156	125.3
20/06/2018 2:20	3.496	125.4
20/06/2018 2:30	3.69	122.1
20/06/2018 2:40	3.697	119.7
20/06/2018 2:50	3.07	110.1
20/06/2018 3:00	3.067	111.5
20/06/2018 3:10	3.598	111.4
20/06/2018 3:20	3.916	110.5
20/06/2018 3:30	2.82	98.5
20/06/2018 3:40	3.491	111

Date & time	Wind speed (m/s)	Wind Direction (°)
20/06/2018 3:50	3.033	120.3
20/06/2018 4:00	3.135	129.8
20/06/2018 4:10	3.668	132.2
20/06/2018 4:20	3.88	133.3
20/06/2018 4:30	3.864	154.5
20/06/2018 4:40	3.585	171.5
20/06/2018 4:50	3.725	165.6
20/06/2018 5:00	2.305	192.4
20/06/2018 5:10	2.944	221.2
20/06/2018 5:20	3.283	214.2
20/06/2018 5:30	4.031	219.9
20/06/2018 5:40	4.484	223.5
20/06/2018 5:50	4.302	214.5
20/06/2018 6:00	4.354	208.8
20/06/2018 6:10	2.37	188.7
20/06/2018 6:20	1.934	179.1
20/06/2018 6:30	3.247	181.9
20/06/2018 6:40	3.468	191.6
20/06/2018 6:50	1.739	137.4
20/06/2018 7:00	2.942	162.3
20/06/2018 7:10	3.941	154.2
20/06/2018 7:20	3.247	149.4
20/06/2018 7:30	3.161	147.3
20/06/2018 7:40	2.998	161
20/06/2018 7:50	2.441	175.9
20/06/2018 8:00	2.105	206.4
20/06/2018 8:10	2.024	201.3
20/06/2018 8:20	2.311	186.6
20/06/2018 8:30	2.474	171.3
20/06/2018 8:40	2.306	189.3
20/06/2018 8:50	1.808	192.9
20/06/2018 9:00	2.239	149.1
20/06/2018 9:10	2.475	175.2
20/06/2018 9:20	2.196	155.6
20/06/2018 9:30	1.859	166.5
20/06/2018 9:40	1.852	164.9
20/06/2018 9:50	1.939	153.4
20/06/2018 10:00	2.004	168
20/06/2018 10:10	2.101	166.2
20/06/2018 10:20	2.38	169.9
20/06/2018 10:30	2.78	167.8
20/06/2018 10:40	2.729	166.1
20/06/2018 10:50	2.684	171.4
20/06/2018 11:00	2.493	192
20/06/2018 11:20	2.464	202.6
20/06/2018 11:30	2.408	174.8
20/06/2018 11:40	2.453	174
20/06/2018 11:50	2.7	211.3
20/06/2018 12:00	2.823	187.4
20/06/2018 12:10	3.073	181.1
20/06/2018 12:20	3.162	169.9

Date & time	Wind speed (m/s)	Wind Direction (°)
20/06/2018 12:30	2.517	187.9
20/06/2018 12:40	2.359	204.8
20/06/2018 12:50	2.406	203.9
20/06/2018 13:00	2.141	189.9
20/06/2018 13:10	2.786	172
20/06/2018 13:20	2.33	140.8
20/06/2018 13:30	2.51	180.5
20/06/2018 13:40	3.247	192.2
20/06/2018 13:50	2.86	196.4
20/06/2018 14:00	3.321	169.5
20/06/2018 14:10	2.781	182.3
20/06/2018 14:20	2.972	179.1
20/06/2018 14:30	3.517	168.3
20/06/2018 14:40	2.74	162.1
20/06/2018 14:50	3.633	162
20/06/2018 15:00	2.678	166.4
20/06/2018 15:10	2.999	184.7
20/06/2018 15:20	3.157	183.3
20/06/2018 15:30	3.065	188.7
20/06/2018 15:40	2.835	169.2
20/06/2018 15:50	3.119	190
20/06/2018 16:00	3.361	167.6
20/06/2018 16:10	2.982	158.7
20/06/2018 16:20	3.093	167.7
20/06/2018 16:30	2.668	156.6
20/06/2018 16:40	3.375	171
20/06/2018 16:50	2.343	163.7
20/06/2018 17:00	3.062	157.9
20/06/2018 17:10	2.86	159.8
20/06/2018 17:20	2.314	170.9
20/06/2018 17:30	2.26	168.9
20/06/2018 17:40	2.26	168.3
20/06/2018 17:50	2.272	168.4
20/06/2018 18:00	2.126	169.8
20/06/2018 18:10	1.946	146.7
20/06/2018 18:20	2.034	146.1
20/06/2018 18:30	1.862	153.7
20/06/2018 18:40	1.815	148.4
20/06/2018 18:50	1.872	140.6
20/06/2018 19:00	1.908	150.7
20/06/2018 19:10	2.481	164.4
20/06/2018 19:20	2.273	153.9
20/06/2018 19:30	2.158	159.2
20/06/2018 19:40	1.847	160.6
20/06/2018 19:50	1.182	159.4
20/06/2018 20:00	0.628	155
20/06/2018 20:10	1.13	140.1
20/06/2018 20:20	1.555	129
20/06/2018 20:30	1.489	145.8
20/06/2018 20:40	1.154	150.8
20/06/2018 20:50	1.018	144.7

Date & time	Wind speed (m/s)	Wind Direction (°)
20/06/2018 21:00	1.022	114.4
20/06/2018 21:10	1.779	139.9
20/06/2018 21:20	1.609	146.2
20/06/2018 21:30	1.23	155.8
20/06/2018 21:40	0.905	163.2
20/06/2018 21:50	0.936	215.3
20/06/2018 22:00	0.696	189.7
20/06/2018 22:10	0.206	204.8
20/06/2018 22:20	0.834	236.9
20/06/2018 22:30	1.016	191.1
20/06/2018 22:40	0.868	140
20/06/2018 22:50	2.142	166.3
20/06/2018 23:00	1.74	156.9
20/06/2018 23:10	1.848	155.4
20/06/2018 23:20	2.006	119.9
20/06/2018 23:30	1.803	140.2
20/06/2018 23:40	1.664	99.7
20/06/2018 23:50	1.432	136.1
21/06/2018 0:00	1.282	133.9
21/06/2018 0:10	1.767	152.7
21/06/2018 0:20	1.507	135.5
21/06/2018 0:30	1.034	134.6
21/06/2018 0:40	1.414	134.7
21/06/2018 0:50	1.332	128
21/06/2018 1:00	1.019	132.9
21/06/2018 1:10	0.851	131.9
21/06/2018 1:20	0.867	103.9
21/06/2018 1:30	0.157	131.2
21/06/2018 1:40	0.116	152.9
21/06/2018 1:50	0	0
21/06/2018 2:00	0	235.7
21/06/2018 2:10	0.213	342.9
21/06/2018 2:20	0.573	311.3
21/06/2018 2:30	0.862	340.5
21/06/2018 2:40	1.194	353.8
21/06/2018 2:50	1.986	22.71
21/06/2018 3:00	1.847	30.71
21/06/2018 3:10	1.228	38.76
21/06/2018 3:20	0.038	22.57
21/06/2018 3:30	0.008	88.3
21/06/2018 3:40	0.656	253.6
21/06/2018 3:50	0.934	236.7
21/06/2018 4:00	0.773	200.9
21/06/2018 4:10	0.897	209.3
21/06/2018 4:20	2.147	223.7
21/06/2018 4:30	1.952	210.8
21/06/2018 4:40	1.69	207.9
21/06/2018 4:50	1.306	178.9
21/06/2018 5:00	1.89	151.3
21/06/2018 5:10	2.393	142.9
21/06/2018 5:20	1.758	141.8

Date & time	Wind speed (m/s)	Wind Direction (°)
21/06/2018 5:30	1.655	153.8
21/06/2018 5:40	2.467	148.3
21/06/2018 5:50	2.328	142.8
21/06/2018 6:00	2.039	153.8
21/06/2018 6:10	1.775	183.4
21/06/2018 6:20	1.897	178.6
21/06/2018 6:30	1.21	170.3
21/06/2018 6:40	1.462	158.7
21/06/2018 6:50	1.396	166.4
21/06/2018 7:00	1.597	148.2
21/06/2018 7:10	0.708	139
21/06/2018 7:20	0.946	128.9
21/06/2018 7:30	0.318	125.3
21/06/2018 7:40	0.606	164.5
21/06/2018 7:50	0.518	160.7
21/06/2018 8:00	0.496	169.6
21/06/2018 8:10	0.293	169.6
21/06/2018 8:20	0	0
21/06/2018 8:30	0.09	150.4
21/06/2018 8:40	0.277	113.2
21/06/2018 8:50	0.27	79.17
21/06/2018 9:00	0.06	81.7
21/06/2018 9:10	0.148	33.1
21/06/2018 9:20	0.878	81.4
21/06/2018 9:30	0.921	91.1
21/06/2018 9:40	0.797	107.1
21/06/2018 9:50	1.052	149.8
21/06/2018 10:00	0.863	183.2
21/06/2018 10:10	1.157	196.3
21/06/2018 10:20	1.181	145.6
21/06/2018 10:30	0.734	153.8
21/06/2018 10:40	1.104	168.4
21/06/2018 10:50	0.323	314.4
21/06/2018 11:00	0.41	111.1
21/06/2018 11:10	0.89	123.5
21/06/2018 11:20	1.018	123.3
21/06/2018 11:30	1.08	197.2
21/06/2018 11:40	1.755	257
21/06/2018 11:50	1.341	191.2
21/06/2018 12:00	1.097	157.1
21/06/2018 12:10	1.26	177.8
21/06/2018 12:20	1.543	194.7
21/06/2018 12:30	1.458	240.4
21/06/2018 12:40	1.736	229.1
21/06/2018 12:50	1.991	237.3
21/06/2018 13:00	2.504	185.4
21/06/2018 13:10	2.184	192.2
21/06/2018 13:20	2.431	231.8
21/06/2018 13:30	2.224	224.2
21/06/2018 13:40	1.428	250
21/06/2018 13:50	1.059	54.26

Date & time	Wind speed (m/s)	Wind Direction (°)
21/06/2018 14:00	1.615	214
21/06/2018 14:10	1.919	237.6
21/06/2018 14:20	2.222	203.2
21/06/2018 14:30	1.774	178.9
21/06/2018 14:40	1.142	187.5
21/06/2018 14:50	1.018	186.8
21/06/2018 15:00	0.65	260.3
21/06/2018 15:10	1.94	202
21/06/2018 15:20	1.737	175.3
21/06/2018 15:30	0.974	170.8
21/06/2018 15:40	1.399	196
21/06/2018 15:50	1.892	195.5
21/06/2018 16:00	1.866	167.1
21/06/2018 16:10	1.574	153.3
21/06/2018 16:20	2.39	162.4
21/06/2018 16:30	1.705	169.3
21/06/2018 16:40	2.021	155.2
21/06/2018 16:50	2.479	166.7
21/06/2018 17:00	2.089	166.3
21/06/2018 17:10	2.206	170.6
21/06/2018 17:20	2.129	171.7
21/06/2018 17:30	1.846	162.6
21/06/2018 17:40	1.68	156.4
21/06/2018 17:50	1.853	136.6
21/06/2018 18:00	1.747	153.5
21/06/2018 18:10	1.902	147.7
21/06/2018 18:20	1.624	149.4
21/06/2018 18:30	2.478	153.9
21/06/2018 18:40	1.65	198.6
21/06/2018 18:50	1.555	173.8
21/06/2018 19:00	1.458	159.7
21/06/2018 19:10	1.117	142
21/06/2018 19:20	1.854	136.9
21/06/2018 19:30	2.107	152.8
21/06/2018 19:40	2.015	163.1
21/06/2018 19:50	2.122	164.6
21/06/2018 20:00	2.467	159.7
21/06/2018 20:10	1.87	163.6
21/06/2018 20:20	1.51	163.2
21/06/2018 20:30	1.703	149.2
21/06/2018 20:40	1.941	159.6
21/06/2018 20:50	1.644	168.3
21/06/2018 21:00	1.5	157.1
21/06/2018 21:10	1.6	155.2
21/06/2018 21:20	2.021	165.9
21/06/2018 21:30	1.464	167.6
21/06/2018 21:40	1.531	152.5
21/06/2018 21:50	2.005	152.1
21/06/2018 22:00	2.287	159.8
21/06/2018 22:10	2.254	172.9
21/06/2018 22:20	0.153	145.7

Date & time	Wind speed (m/s)	Wind Direction (°)
21/06/2018 22:30	0.142	171.7
21/06/2018 22:40	0.963	160.6
21/06/2018 22:50	1.432	164.1
21/06/2018 23:00	1.697	141.5
21/06/2018 23:10	2.197	157.6
21/06/2018 23:20	2.163	164.7
21/06/2018 23:30	2.062	169.2
21/06/2018 23:40	1.991	157.9
21/06/2018 23:50	1.522	156.1
22/06/2018 0:00	1.912	166.1
22/06/2018 0:10	1.598	171.2
22/06/2018 0:20	1.41	168.4
22/06/2018 0:30	1.206	161.3
22/06/2018 0:40	1.338	162.1
22/06/2018 0:50	1.59	172.3
22/06/2018 1:00	1.293	163.6
22/06/2018 1:10	1.029	159.9
22/06/2018 1:20	1.497	168.5
22/06/2018 1:30	1.969	169.9
22/06/2018 1:40	1.949	168.7
22/06/2018 1:50	1.477	156.3
22/06/2018 2:00	1.541	159.6
22/06/2018 2:10	1.682	158.8
22/06/2018 2:20	2.617	160.7
22/06/2018 2:30	2.704	152.3
22/06/2018 2:40	2.372	153.8
22/06/2018 2:50	2.125	154.5
22/06/2018 3:00	1.592	153.1
22/06/2018 3:10	1.569	132.1
22/06/2018 3:20	1.875	111.6
22/06/2018 3:30	1.892	113.4
22/06/2018 3:40	1.242	101
22/06/2018 3:50	0.73	113.2
22/06/2018 4:00	1.417	147.3
22/06/2018 4:10	1.743	153.3
22/06/2018 4:20	1.439	152.1
22/06/2018 4:30	2.085	166.8
22/06/2018 4:40	2.123	167.6
22/06/2018 4:50	1.913	179.5
22/06/2018 5:00	1.449	185.1
22/06/2018 5:10	0.68	172.3
22/06/2018 5:20	1.005	172.9
22/06/2018 5:30	1.48	165.3
22/06/2018 5:40	1.207	161.1
22/06/2018 5:50	0.906	159.3
22/06/2018 6:00	1.679	163.7
22/06/2018 6:10	2.104	160.2
22/06/2018 6:20	1.44	142
22/06/2018 6:30	1.31	146.6
22/06/2018 6:40	1.674	149.5
22/06/2018 6:50	2.023	154

Date & time	Wind speed (m/s)	Wind Direction (°)
22/06/2018 7:00	1.662	182.6
22/06/2018 7:10	0.885	211
22/06/2018 7:20	0.623	190.7
22/06/2018 7:30	1.514	164.4
22/06/2018 7:40	1.481	164.5
22/06/2018 7:50	1.847	173
22/06/2018 8:00	2.206	171.5
22/06/2018 8:10	1.749	148.5
22/06/2018 8:20	1.635	156.8
22/06/2018 8:30	1.57	158.4
22/06/2018 8:40	1.301	152.8
22/06/2018 8:50	1.231	155.5
22/06/2018 9:00	1.196	155.6
22/06/2018 9:10	1.307	164.3
22/06/2018 9:20	1.391	174.7
22/06/2018 9:30	1.161	170
22/06/2018 9:40	0.983	155.6
22/06/2018 9:50	0.831	144.1
22/06/2018 10:00	0.975	137.8
22/06/2018 10:10	1.106	152.1
22/06/2018 10:20	1.188	191.8
22/06/2018 10:30	0.876	197.2
22/06/2018 10:40	1.057	206.3
22/06/2018 10:50	0.928	225.3
22/06/2018 11:00	0.497	269.5
22/06/2018 11:10	0.494	177.8
22/06/2018 11:20	1.06	307.6
22/06/2018 11:30	1.017	2.881
22/06/2018 11:40	1.094	295
22/06/2018 11:50	1.47	275
22/06/2018 12:00	1.361	330.7
22/06/2018 12:10	0.895	249.5
22/06/2018 12:20	1.621	262.2
22/06/2018 12:30	1.607	294.3
22/06/2018 12:40	1.534	277.2
22/06/2018 12:50	1.901	17.87
22/06/2018 13:00	2.214	15.36
22/06/2018 13:10	1.155	38.93
22/06/2018 13:20	1.243	240.1
22/06/2018 13:30	1.843	193.1
22/06/2018 13:40	1.341	170.6
22/06/2018 13:50	1.484	143.2
22/06/2018 14:00	0.871	135.7
22/06/2018 14:10	1.971	179.2
22/06/2018 14:20	1.73	186.3
22/06/2018 14:30	0.91	224.6
22/06/2018 14:40	0.759	215.8
22/06/2018 14:50	2.022	201.9
22/06/2018 15:00	1.71	155.8
22/06/2018 15:10	1.51	145.7
22/06/2018 15:20	0.834	90.6

Date & time	Wind speed (m/s)	Wind Direction (°)
22/06/2018 15:30	1.035	82.9
22/06/2018 15:40	1.147	174.4
22/06/2018 15:50	2.002	166.2
22/06/2018 16:00	1.971	200.8
22/06/2018 16:10	2.071	189.8
22/06/2018 16:20	1.653	197.8
22/06/2018 16:30	2.308	204.7
22/06/2018 16:40	2.354	198.3
22/06/2018 16:50	2.437	175.7
22/06/2018 17:00	2.335	181.7
22/06/2018 17:10	2.04	184.5
22/06/2018 17:20	2.264	195
22/06/2018 17:30	2.197	189.8
22/06/2018 17:40	2.217	192.6
22/06/2018 17:50	2.527	190
22/06/2018 18:00	2.328	171.2
22/06/2018 18:10	2.036	163.7
22/06/2018 18:20	1.889	166.3
22/06/2018 18:30	1.983	154
22/06/2018 18:40	2.237	157.1
22/06/2018 18:50	2.382	160.8
22/06/2018 19:00	2.763	166.2
22/06/2018 19:10	2.396	160.1
22/06/2018 19:20	2.574	165.7
22/06/2018 19:30	2.522	168.1
22/06/2018 19:40	2.211	165.5
22/06/2018 19:50	1.828	151.1
22/06/2018 20:00	1.931	155.6
22/06/2018 20:10	2.38	162.1
22/06/2018 20:20	1.995	152.9
22/06/2018 20:30	1.875	152.3
22/06/2018 20:40	2.182	148.7
22/06/2018 20:50	2.491	152.9
22/06/2018 21:00	2.715	152.6
22/06/2018 21:10	2.446	152.8
22/06/2018 21:20	2.559	155
22/06/2018 21:30	2.714	165.9
22/06/2018 21:40	1.911	160.6
22/06/2018 21:50	1.627	155.2
22/06/2018 22:00	1.543	169.7
22/06/2018 22:10	1.274	181.2
22/06/2018 22:20	0.293	187.2
22/06/2018 22:30	0	0
22/06/2018 22:40	0	0
22/06/2018 22:50	0.177	160.1
22/06/2018 23:00	0.837	133.6
22/06/2018 23:10	1.158	137.1
22/06/2018 23:20	1.353	144.8
22/06/2018 23:30	0.995	153.4
22/06/2018 23:40	1.052	147.7
22/06/2018 23:50	1.001	139.4

-End of report-