SURFACE WATER, DEPOSITIONAL DUST, HVAS AND METEOROLOGICAL MONITORING

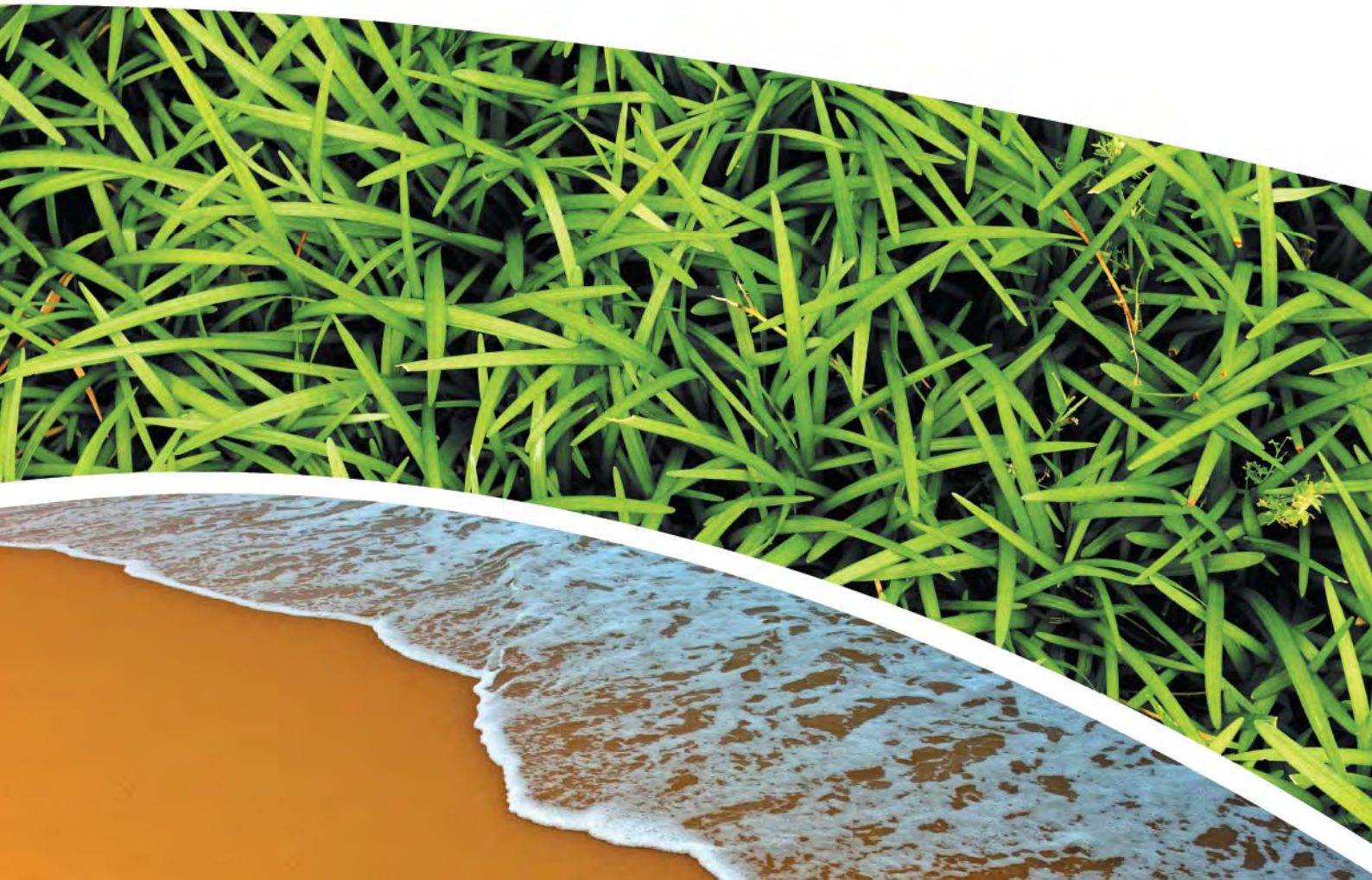
Prepared for Pine Dale Mine Community Consultative Committee

Prepared by RCA Australia

RCA ref 6880-844/0

January 2014

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL



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RCA LE ref 6880-844/0

14 February 2014

Pine Dale Mine
PO Box 202
WALLERAWANG NSW 2845

Attention: Mr Graham Goodwin

REPORT COMPILED FOR
PINE DALE MINE COMMUNITY CONSULTATIVE COMMITTEE
DETAILING SURFACE WATER, GROUNDWATER DEPOSITIONAL DUST, HVAS AND METEOROLOGICAL MONITORING
JANUARY 2014

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1 GENERAL COMMENTS

Job Number: 6880.
Date Samples Received: During the month of January 2014
Samples received were sampled by RCA Laboratories – Environmental staff.

This report satisfies the requirements to monitor environmental parameters as presented in the Pine Dale Mine Environmental Protection Licence (EPL 4911).

2 ANALYTICAL PROCEDURES

The analytical procedures used by RCA Laboratories – Environmental are based on established internationally recognised procedures such as APHA and Australian Standards. Analytical test methods are detailed in **Table 1**. When an external testing laboratory is used to obtain the analysis of samples which become a part of this report, then the details of that laboratory's official report will be attached in an Appendix.

Table 1 *Analytical Test Methods*

ANALYSIS	METHOD	UNITS	ANALYSING LABORATORY	NATA/ NON-NATA ANALYSIS
Determination of Suspended Particulate Matter	ENV-LAB003	µg/m^3	RCA Laboratories - Environmental	NATA Analysis
Determination of Particulate Matter – Deposited Matter	ENV-LAB004	g/m^2/month	RCA Laboratories - Environmental	NATA Analysis
pH	ENV-LAB006	pH	RCA Laboratories - Environmental	NATA Analysis
Conductivity	ENV-LAB010	µS/cm	RCA Laboratories - Environmental	NATA Analysis
Total Suspended Solids	ENV-LAB009	mg/L	RCA Laboratories - Environmental	NATA Analysis
Total Dissolved Solids	ENV-LAB020	mg/L	RCA Laboratories - Environmental	NATA Analysis
Turbidity	ENV-LAB037	NTU	RCA Laboratories - Environmental	NATA Analysis*
Oil and Grease	ENV-LAB022	mg/L	RCA Laboratories - Environmental	Non-NATA Analysis
Dissolved Oxygen	Manufacturer's Instructions	mg/L	RCA Laboratories - Environmental	Non-NATA Analysis**
Major Anions (Alkalinity, Cl, SO_4)	ED037, ED041, ED045	mg/L	ALS	NATA Analysis
Major Cations (Ca, Mg, Na, K)	ED093	mg/L	ALS	NATA Analysis
Dissolved Metals	EG020F	mg/L	ALS	NATA Analysis

*Note that turbidity sampling and analysis is conducted to NATA approved method ENV-LAB037, however as the meter is not owned by RCA Laboratories- Environmental the test cannot be considered NATA accredited.

**Dissolved oxygen measurements are undertaken in the field using the DO Meter owned by PDM.

3 WATER MONITORING RESULTS

3.1 GROUNDWATER

A total of 2 on-site groundwater samples were collected during the month of January 2014. Sampling at Bores P2, P3 and P7a are no longer required under the new sampling regime undertaken in accordance with Project Approval (PA 10_0041) and the Pine Dale Mine Water Management Plan (Report No. 613/20). The new sampling regime commenced 1 August 2013. Water quality analysis results are shown in **Table 2**.

Table 2 *Groundwater Analysis Results*

ANALYSIS	UNITS	P6	P7
Sample Number	-	01146880014	01146880015
Date Sampled	-	20/01/14	20/01/14
Time Sampled	-	16:00	16:30
Depth to Water from Surface*	m	27.00	7.10
Water Level (AHD)	m	889.95	887.30
Temperature	°C	15.0	14.5
pH	pH	6.7	7.2
Conductivity	µS/cm	1188	857
Turbidity	NTU	12	
Dissolved Oxygen	mg/L	5	
TSS	mg/L	30	
Oil & Grease	mg/L	<2	
Bicarbonate Alkalinity ($CaCO_3$)	mg/L	74	
Total Alkalinity ($CaCO_3$)	mg/L	74	
Sulfate (as SO_4)	mg/L	502	
Chloride	mg/L	26	
Calcium	mg/L	116	
Magnesium	mg/L	53	
Sodium	mg/L	45	
Potassium	mg/L	21	
Cobalt (dissolved)	mg/L	0.073	
Manganese (dissolved)	mg/L	2.79	
Nickel (dissolved)	mg/L	0.097	
Zinc (dissolved)	mg/L	0.116	
Iron (dissolved)	mg/L	24.3	

NOTES: ***Depth relative to ground level (not standpipe height).

Indicates analysis was not required

Groundwater monitoring locations are shown in **Appendix 1**.

3.2 EPA SURFACE WATER MONITORING

Routine quarterly surface waters were not scheduled to be monitored this month. Quarterly surface water monitoring is next scheduled to be undertaken in February 2014.

4 AIR QUALITY MONITORING RESULTS

4.1 HIGH VOLUME AIR SAMPLERS (HVAS)

HVAS at this facility conform to AS/NZS 3580.9.3:2003, AS/NZS 3580.9.6:2003 and AS/NZS 3580.1.1:2007.

HVAS Total Suspended Particulate analysis results are shown in **Table 3**.

PM_{10} Suspended Particulate Matter results are shown in **Table 4**.

Table 3 *Total Suspended Particulates (µg/m³ 0°C 101.3 kPa)*

RUN DATE	TSP (µg/m^3)	SAMPLE NUMBER	FILTER NUMBER	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
04-Jan-14	41	01146880034	8885682	08-Jan-14	11:30	Client	24.00
10-Jan-14	23	01146880036	8885684	13-Jan-14	10:35	Client	24.00
16-Jan-14	68	01146880038	8885686	20-Jan-14	9:35	Client	24.00
22-Jan-14	14	01146880040	8885688	23-Jan-14	10:05	Client	24.00
28-Jan-14	24	01146880042	8885690	30-Jan-14	13:30	Client	24.00

Table 4 *Suspended Particulate Matter PM_{10} (µg/m^3 0^{o}C 101.3 kPa)*

RUN DATE	PM_{10} (µg/m^3)	SAMPLE NUMBER	FILTER NUMBER	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
04-Jan-14	16	01146880035	8885683	08-Jan-14	11:30	Client	24.00
10-Jan-14	15	01146880037	8885685	13-Jan-14	10:35	Client	24.00
16-Jan-14	34	01146880039	8885687	20-Jan-14	9:35	Client	24.00
22-Jan-14	5	01146880041	8885689	23-Jan-14	10:05	Client	24.00
28-Jan-14	13	01146880043	8890609	30-Jan-14	13:30	Client	24.00

4.1.1 TSP Summary

The EPA Annual Mean TSP allowable limit is 90µg/m^3. All TSP HVAS results recorded during this monitoring period are in compliance with consent conditions, as the *current rolling annual mean* (from February 2013 to January 2014) for the TSP unit is 26.5µg/m^3, which is well below the allowable limit of 90µg/m^3.

4.1.2 PM_{10} Summary

The EPA Annual Mean TSP allowable limit is 90µg/m^3. All TSP HVAS results recorded during this monitoring period are in compliance with consent conditions, as the *current rolling annual mean* (from February 2013 to January 2014) for the TSP unit is 26.5µg/m^3, which is well below the allowable limit of 90µg/m^3.

4.1.3 Comments

HVAS monitoring locations are shown in **Appendix 1**.

Graphical HVAS results presentations are shown in **Appendix 2**.

4.2 DEPOSITIONAL DUST

Depositional Dust Gauges at this facility conform to AS/NZS 3580.10.1:2003 and AS/NZS 3580.1.1:2007. Depositional Dust monitoring results are shown in **Table 5**.

Table 5 *Depositional Dust Monitoring - Deposited Matter January 2014*

SAMPLE NUMBER	DEPOSIT GAUGE	DATE SAMPLE STARTED	DATE SAMPLE COMPLETED	NUMBER OF DAYS	NOTES	INSOLUBLE SOLIDS (g/m^2.month)	ASH (g/m^2.month)	COMBUSTIBLE MATTER (g/m^2.month)
01146880024	D1	19/12/2013	20/01/2014	32	I	1.0	0.6	0.4
01146880025	D2	19/12/2013	20/01/2014	32	I	1.1	0.6	0.5
01146880026	D3	19/12/2013	20/01/2014	32	I	1.5	1.0	0.5
01146880027	D4	19/12/2013	20/01/2014	32	I	0.6	0.3	0.3
01146880028	D5	19/12/2013	20/01/2014	32	I	1.9	0.8	1.1
01146880029	D6	19/12/2013	20/01/2014	32	I	1.0	0.5	0.5

4.2.1 Glossary of Terms Used in Notes

I Insects (eg, Ants, spiders)

4.2.2 Allowable Depositional Dust Limits

The EPA Long Term (Annual Average) Dust Limit is $4g/m^2$ per month. All Depositional Dust results during this monitoring period are in compliance with consent conditions. The Annual Average for Dust Gauges D1, D2, D3, D4, D5 and D6 are all less than or equal to $1.6g/m^2$ per month, which is below the allowable Annual Average Long Term Limit of $4g/m^2$ per month.

Depositional Dust monitoring locations are shown in **Appendix 1**.
Graphical Depositional Dust results are shown in **Appendix 2**.

5 BLASTING RESULTS

Blasting results for the month of January are shown in **Table 6**.

Table 6 *Blasting Results- Airblast Overpressure (dB) and Ground Vibration (mm/sec)*

Date	***Park***		***Noon St.***		***Summer St.***	
	Overpressure (dB)	Vibration (mm/sec)	Overpressure (dB)	Vibration (mm/sec)	Overpressure (dB)	Vibration (mm/sec)
21/01/2014	NT	NT	NT	NT	NT	NT
2012- 2013 Year to Date Information						
Minimum	96.9	0.38	78.3	0.08	87.2	0.08
Average	96.9	0.38	103.3	0.84	106.0	1.08
Maximum	96.9	0.38	113.5	2.21	113.3	2.17
% > EPL 95% Compliance Criteria	0	0	0	0	0	0
% > EPL 100% Compliance Criteria	0	0	0	0	0	0

Notes: NT - No Trigger. Blast monitoring unit was not triggered during the blast.

5.1.1 Allowable Blasting Limits

Conditions of EPL 4911 state that in relation to airblast overpressure levels a result of greater than 115dB must not be observed at any noise sensitive location for more than 5% of the total number of blasts over each annual reporting period. All blasts within the annual reporting period (100% of blasts) are not to exceed the compliance criteria of 120dB. Ground vibration peak velocity levels must not exceed 5mm/sec for 95% of blasts, whilst an intensity of 10mm/sec must not be exceeded by any blast during the reporting period. The reporting period runs as a rolling 12-month average from February 2013 to January 2014.

During January 2014, none of the blast monitors were triggered during the single blasting event which occured during the month, therefore there was no exceedance of the EPL conditions for either overpressure or vibration levels. In terms of the rolling annual average, no blasts have exceeded the 100% compliance conditions of 120dB and 10mm/sec for overpressure and vibration respectively. The overpressure and vibration criteria of 115dB and 5mm/sec, respectively, have not been exceeded for more than 5% of the blasts during the reporting period.

Graphical presentation of the blasting results from overpressure and vibration are shown in **Appendix 2**.

6 NOISE MONITORING RESULTS

Routine quarterly noise monitoring was undertaken during this reporting period on 20 and 21 January 2014. The quarterly noise surveys consist of three 15-minute attended noise assessments between the hours of 7:00am and 6:00pm at six locations as determined by the site's *Noise Management Plan* and EPL No.4911, whilst in accordance with Project Approval 10_0041, schedule 3-1.

Quarterly noise monitoring results for the month of January is presented in **Table 7**. Noise monitoring results indicate the noise contribution from Pine Dale Mine was within the allowable noise limits nominated in EPL No. 4911.

Noise monitoring locations are provided in **Appendix 1**, with locations situated at each of the deposition dust gauge monitoring sites.

Table 7 *Attended Noise Monitoring Results – January 2014*

Location	Date and Time	Daytime Noise Level recorded dB ($L_{Aeq\ 15\ minute}$)	PDM Noise Contribution dB ($L_{Aeq\ 15\ minute}$)	Daytime Noise Limit dB ($L_{Aeq\ 15\ minute}$)
NM1 (EPL Ref No. 33)	20/01/2014 9:20	47.4	34.5	**42**
	20/01/2014 9:35	47.6	34.6	
	20/01/2014 9:50	49.3	36.3	
NM2 (EPL Ref No. 14)	20/01/2014 10:19	49.4	NIL	**42**
	20/01/2014 10:34	47.7	NIL	
	20/01/2014 10:49	49.4	NIL	
NM3 (EPL Ref No. 10)	21/01/2014 7:39	44.3	NIL	**42**
	21/01/2014 7:54	46.8	NIL	
	21/01/2014 8:09	44.5	NIL	
NM4 (EPL Ref No. 5)	20/01/2014 16:10	40.1	NIL	**35**
	20/01/2014 16:25	42.9	NIL	
	20/01/2014 16:40	41.4	NIL	
NM5 (EPL Ref No. 4)	20/01/2014 11:27	33.8	NIL	**35**
	20/01/2014 11:42	36.0	NIL	
	20/01/2014 11:57	35.1	NIL	
NM6 (EPL Ref No. 2)	20/01/2014 13:42	39.4	NIL	**35**
	20/01/2014 13:57	36.4	NIL	
	20/01/2014 14:12	39.9	NIL	

7 OPERATIONAL ACTIVITIES

Pine Dale Mine production rates in January 2014 were above average, with no major issues recorded. There were 19 production days available due to the Christmas break and no weekend work was undertaken during the month. Only one blast was shot throughout the month.

Relatively low rainfall was observed throughout the working month (total of 5.6mm), with half falling on the 25 January, which did not have an impact upon mine operations. The overburden target was above budget this month, whilst the run of mine (ROM) coal from the mine to the raw coal crusher pad were above budget due to the timing of coal recovery that overran from last month. Waste production was above target this month, with approximately 85,000 bank m^3 of overburden excavated. Delivery of coal to Mt Piper was above budget with a total of 21,333 tonnes of coal delivered.

8 SUMMARY

During the month of January 2014 all environmental monitoring constituents were found to be in compliance with EPL 4911.

Quarterly surface water sampling was not required to be conducted this month, with sampling next scheduled for February 2014.

Rolling annual averages from both the TSP and PM_{10} High Volume Air Samplers are currently well below the EPA Annual Mean TSP and PM_{10} criterion of 90µg/m^3 and 30µg/m^3 respectively.

Currently there are no depositional dust gauge results which are greater than the EPA Long Term (annual average) criteria of 4g/m^2.month based upon a rolling average of the past 12 months.

During January the blasting limits documented in the Pine Dale Mine EPL were not exceeded. During the previous twelve-month reporting period, there have been zero non-conformance's based upon the 95% or 100% limits for either overpressure or vibration levels.

Quarterly noise monitoring was conducted this month, with results showing the noise contribution from Pine Dale Mine was below the daytime noise impact assessment criteria as specified in the site's EPL and Noise Management Plan (NMP) across all six monitoring locations.

Please contact the undersigned if you have any queries.

Yours sincerely

Carmen Rocher
Environmental Engineer
RCA Australia Pty Ltd trading as
RCA Laboratories – Environmental

Karen Tripp
Senior Environmental Scientist/Hygienist
RCA Australia Pty Ltd trading as
RCA Laboratories – Environmental

Appendix 1

Surface Water Groundwater and Air Quality Monitoring Locations

Figure WM5
SURFACE WATER
MONITORING LOCATIONS


\\SERVER\RWC\612\Reports\612(26)Cad\612BMP_WM6_6.DWG
TN
MN
DDH6
PDH7
DDH7
DDH5
DDH3
PDH1
DDH4
PDH8
P6
Old Ventilation Shaft
The Bong
P2#
P1#
P7
PDH4
PDH3
REFERENCE
Pine Dale Coal Mine
Yarraboldy Extension
DDH7 Groundwater Monitoring Location
SCALE 1:25 000
250 0 250 500 750 1000 1250 m
Base Photo Source: Dept. of Lands (Bathurst) - Date of Photography: September 2009
Figure WM6
GROUNDWATER
MONITORING LOCATIONS

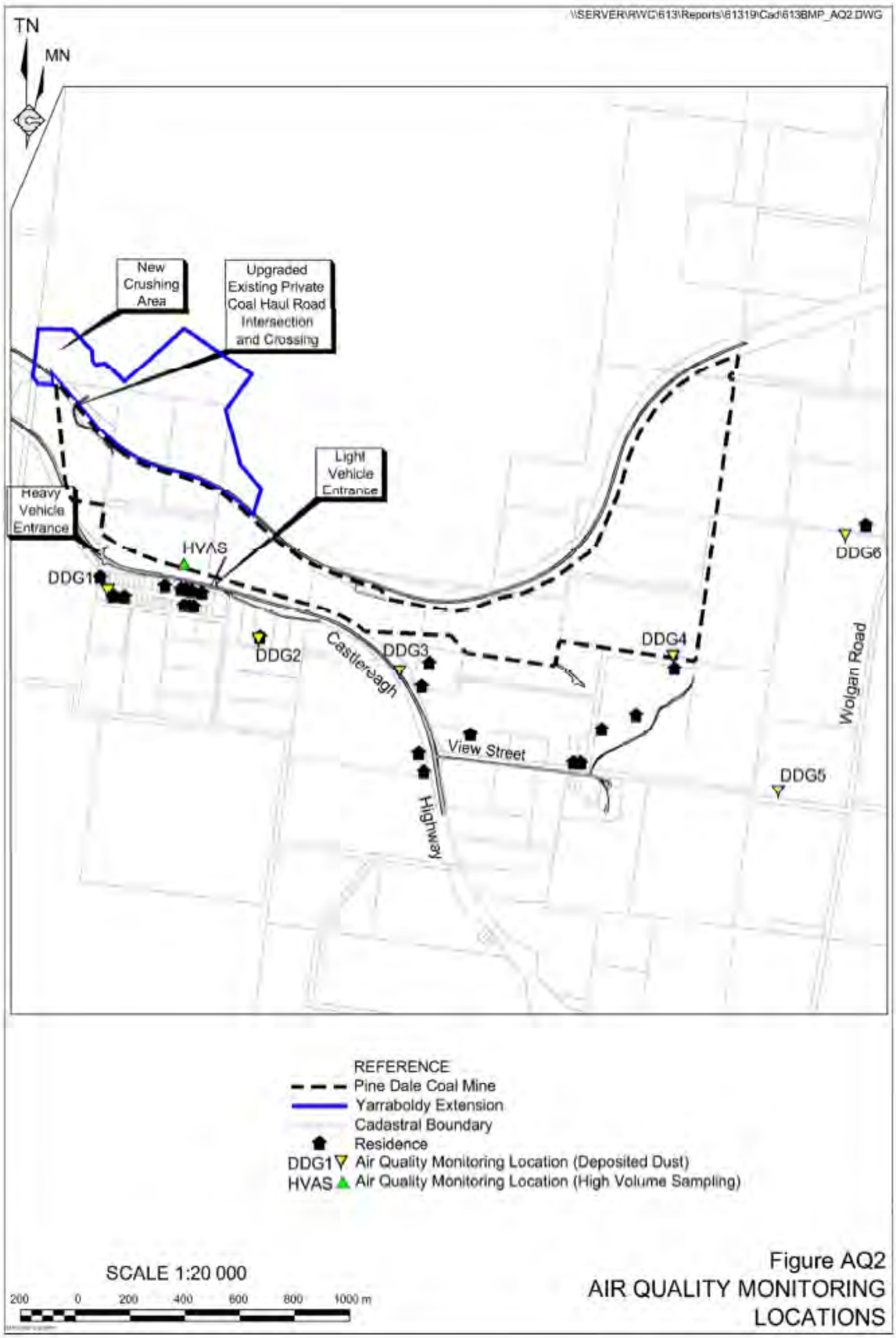
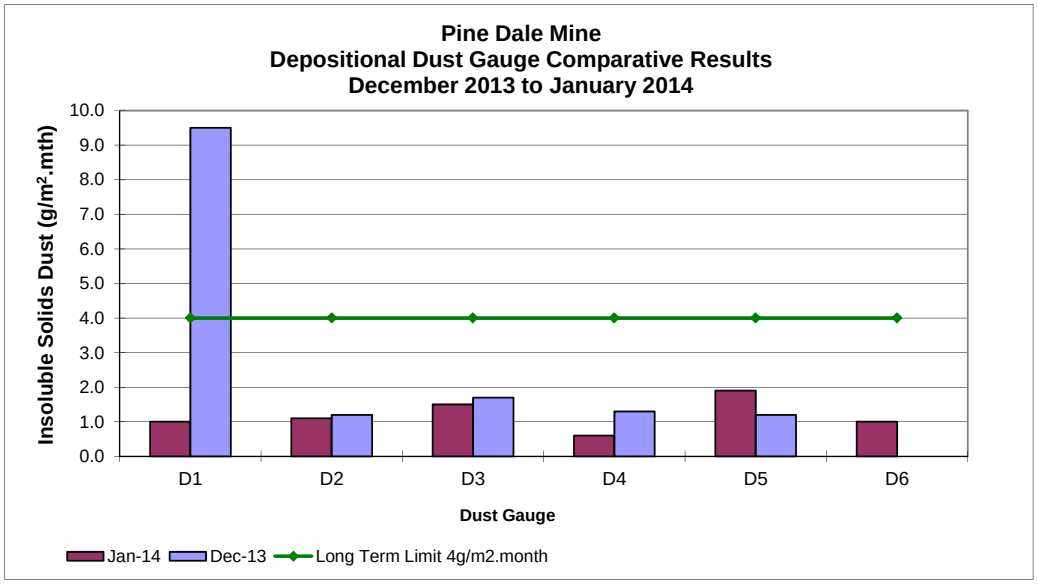
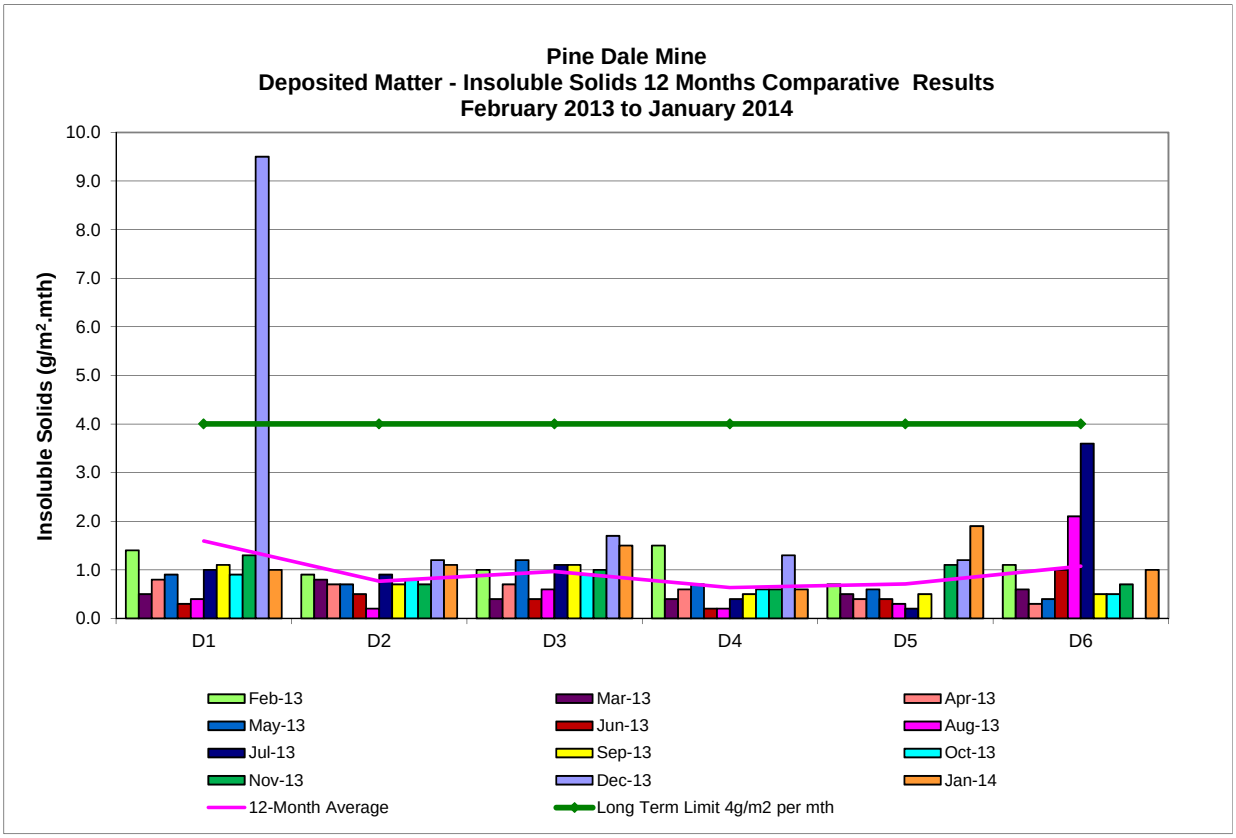


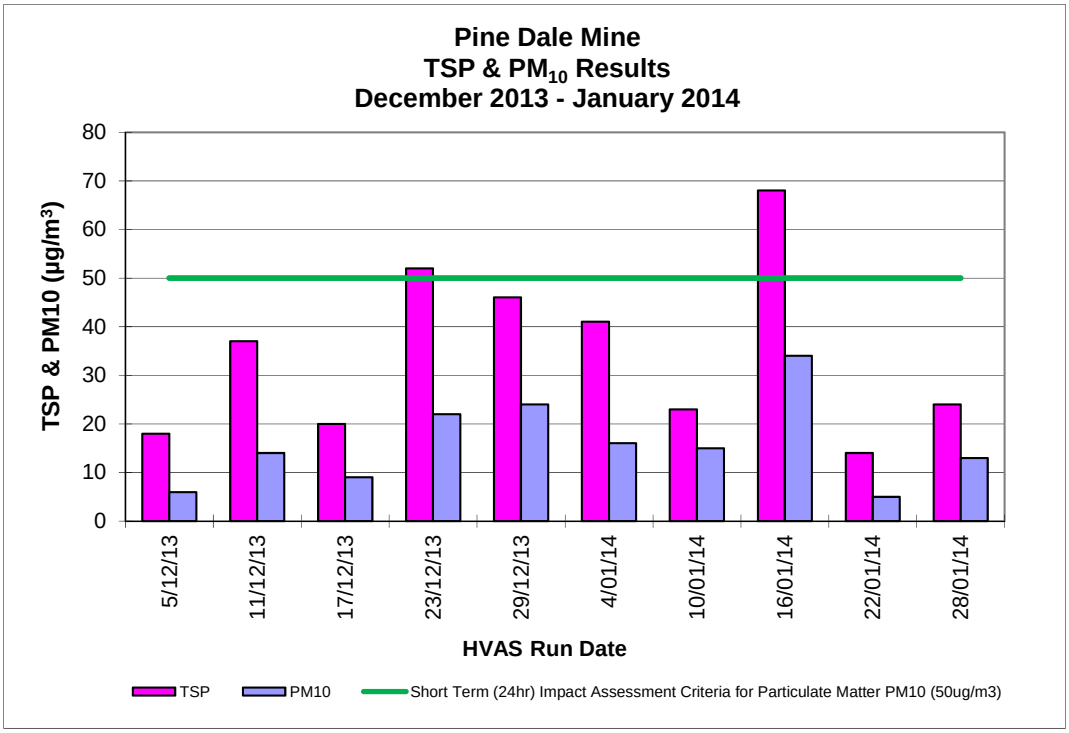
Figure AQ2
AIR QUALITY MONITORING LOCATIONS

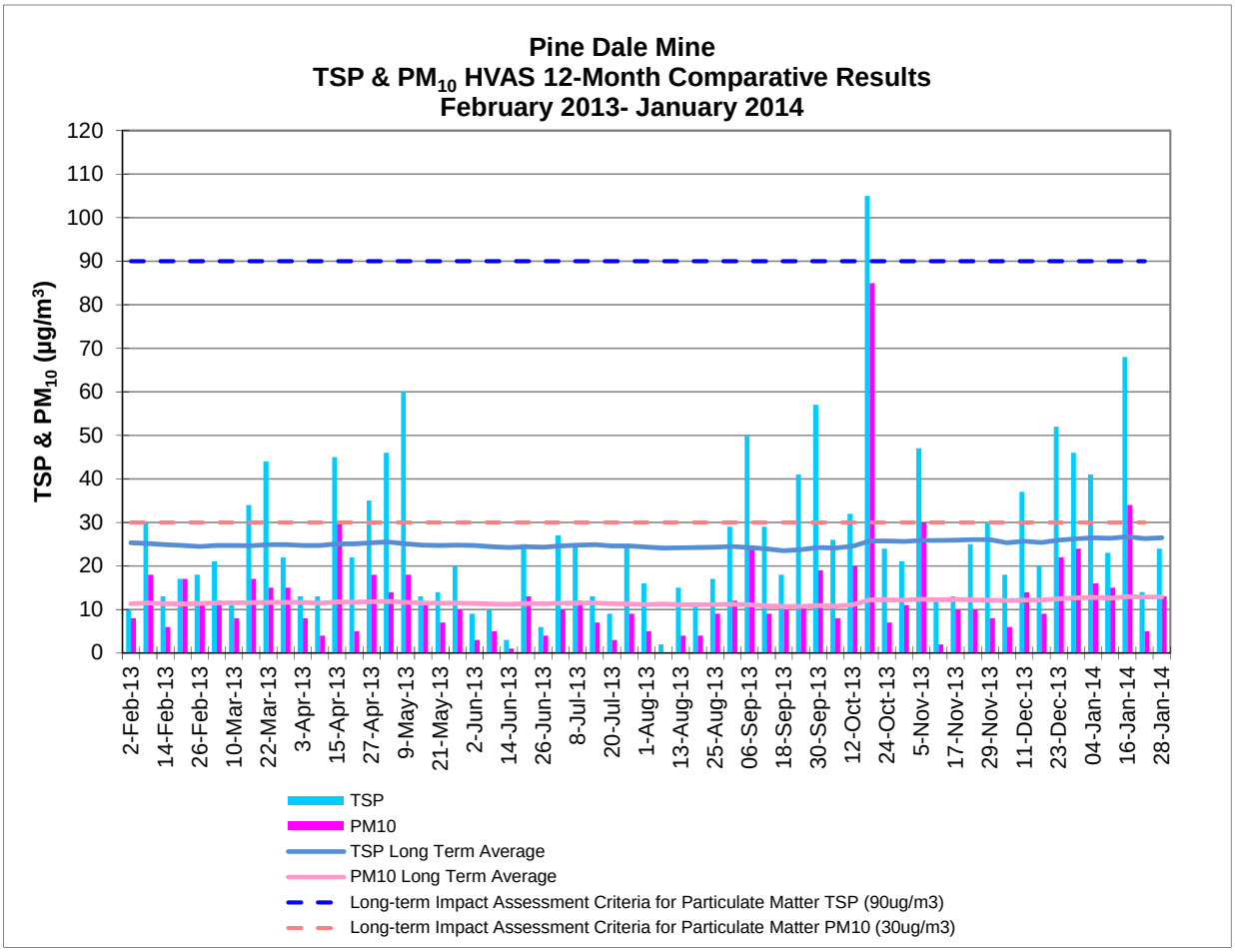
Appendix 2

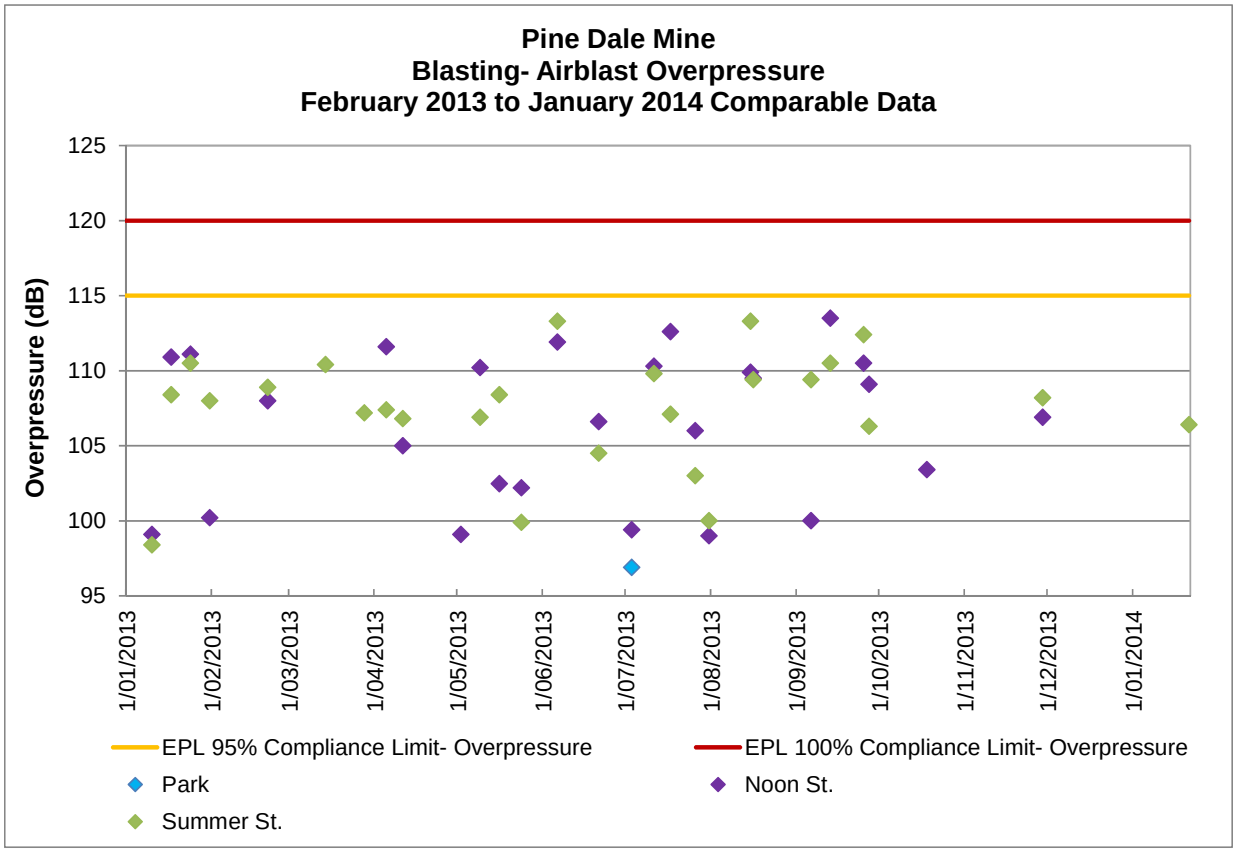
Depositional Dust, HVAS and Blast Result Graphs

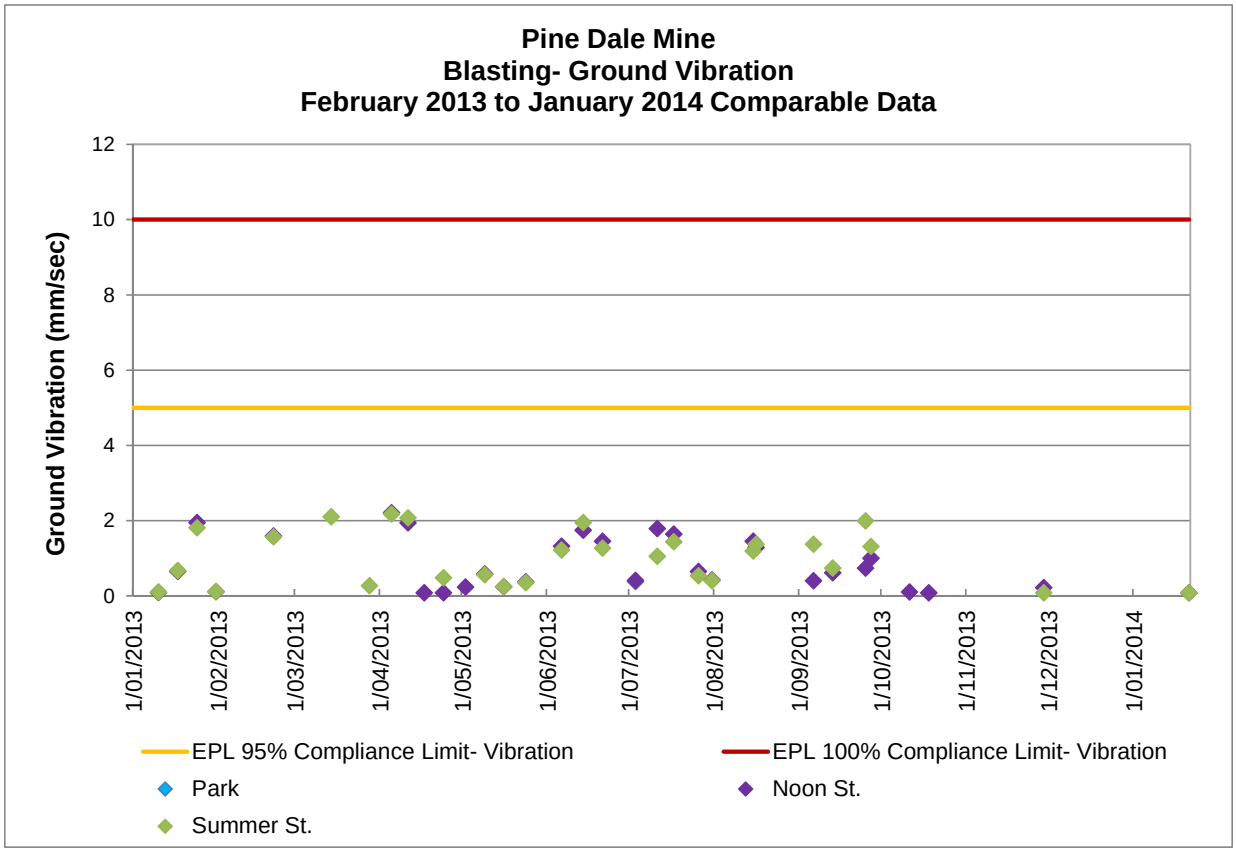

Pine Dale Mine
Depositional Dust Gauge Comparative Results
December 2013 to January 2014
Insoluble Solids Dust (g/m².mth)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
D1
D2
D3
D4
D5
D6
Dust Gauge
Jan-14
Dec-13
Long Term Limit 4g/m2.month


Pine Dale Mine
Deposited Matter - Insoluble Solids 12 Months Comparative Results
February 2013 to January 2014
Insoluble Solids (g/m².mth)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
D1
D2
D3
D4
D5
D6
Feb-13
Mar-13
Apr-13
May-13
Jun-13
Aug-13
Jul-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
12-Month Average
Long Term Limit 4g/m2 per mth


Pine Dale Mine
TSP & PM10 Results
December 2013 - January 2014
TSP & PM10 (µg/m³)
80
70
60
50
40
30
20
10
0
5/12/13
11/12/13
17/12/13
23/12/13
29/12/13
4/01/14
10/01/14
16/01/14
22/01/14
28/01/14
HVAS Run Date
TSP
PM10
Short Term (24hr) Impact Assessment Criteria for Particulate Matter PM10 (50ug/m3)

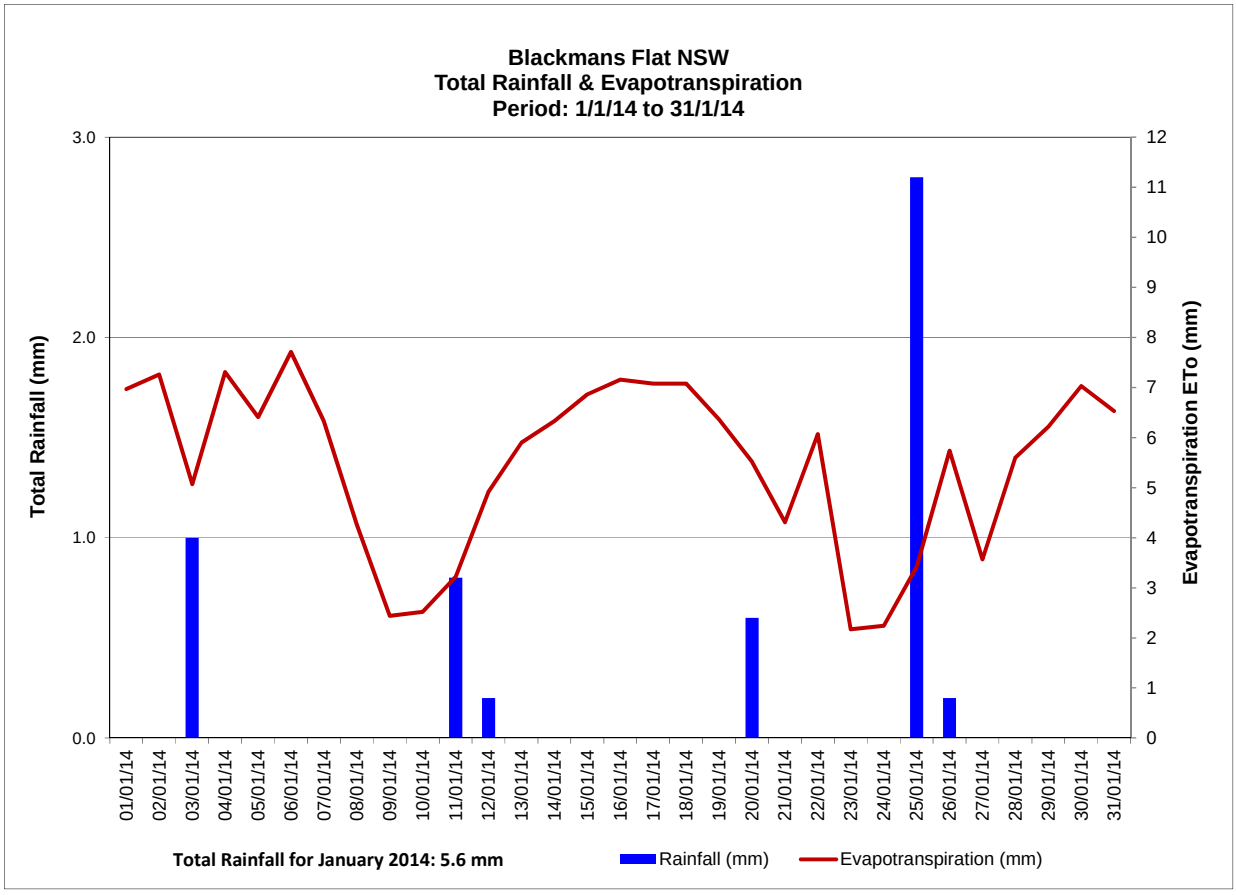

Pine Dale Mine
TSP & PM10 HVAS 12-Month Comparative Results
February 2013- January 2014
TSP & PM10 (µg/m³)
120
110
100
90
80
70
60
50
40
30
20
10
0
2-Feb-13
14-Feb-13
26-Feb-13
10-Mar-13
22-Mar-13
3-Apr-13
15-Apr-13
27-Apr-13
9-May-13
21-May-13
2-Jun-13
14-Jun-13
26-Jun-13
8-Jul-13
20-Jul-13
1-Aug-13
13-Aug-13
25-Aug-13
06-Sep-13
18-Sep-13
30-Sep-13
12-Oct-13
24-Oct-13
5-Nov-13
17-Nov-13
29-Nov-13
11-Dec-13
23-Dec-13
04-Jan-14
16-Jan-14
28-Jan-14
TSP
PM10
TSP Long Term Average
PM10 Long Term Average
Long-term Impact Assessment Criteria for Particulate Matter TSP (90ug/m3)
Long-term Impact Assessment Criteria for Particulate Matter PM10 (30ug/m3)

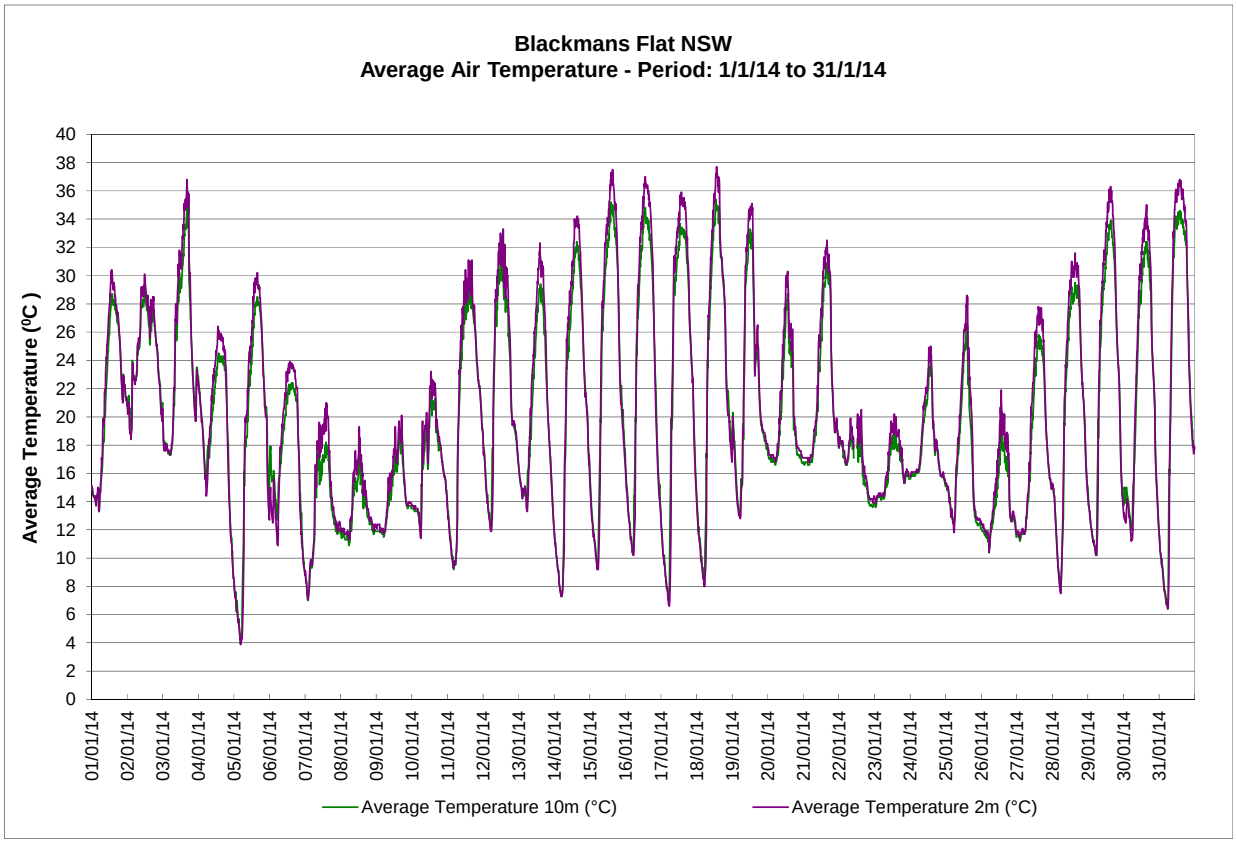

Pine Dale Mine
Blasting- Airblast Overpressure
February 2013 to January 2014 Comparable Data
Overpressure (dB)
125
120
115
110
105
100
95
1/01/2013
1/02/2013
1/03/2013
1/04/2013
1/05/2013
1/06/2013
1/07/2013
1/08/2013
1/09/2013
1/10/2013
1/11/2013
1/12/2013
1/01/2014
EPL 95% Compliance Limit- Overpressure
EPL 100% Compliance Limit- Overpressure
Park
Noon St.
Summer St.

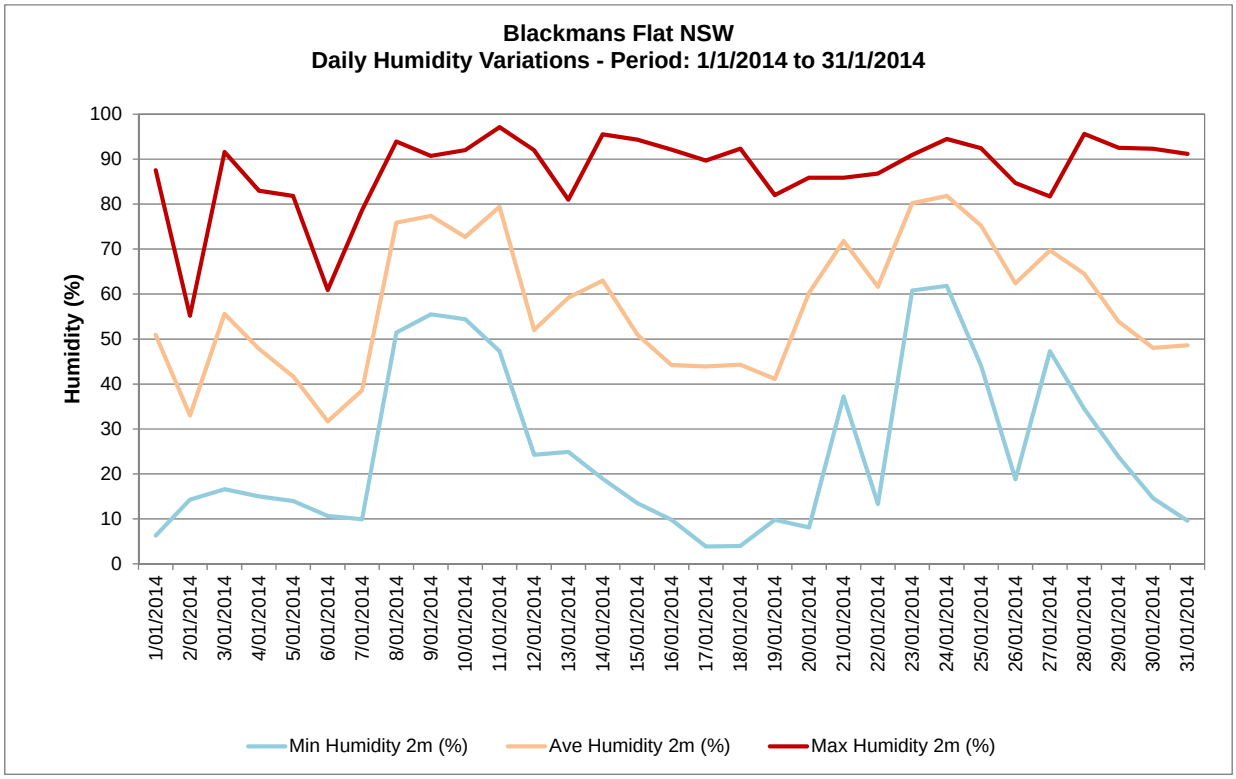

Pine Dale Mine
Blasting- Ground Vibration
February 2013 to January 2014 Comparable Data
Ground Vibration (mm/sec)
12
10
8
6
4
2
0
1/01/2013
1/02/2013
1/03/2013
1/04/2013
1/05/2013
1/06/2013
1/07/2013
1/08/2013
1/09/2013
1/10/2013
1/11/2013
1/12/2013
1/01/2014
EPL 95% Compliance Limit- Vibration
EPL 100% Compliance Limit- Vibration
Park
Noon St.
Summer St.

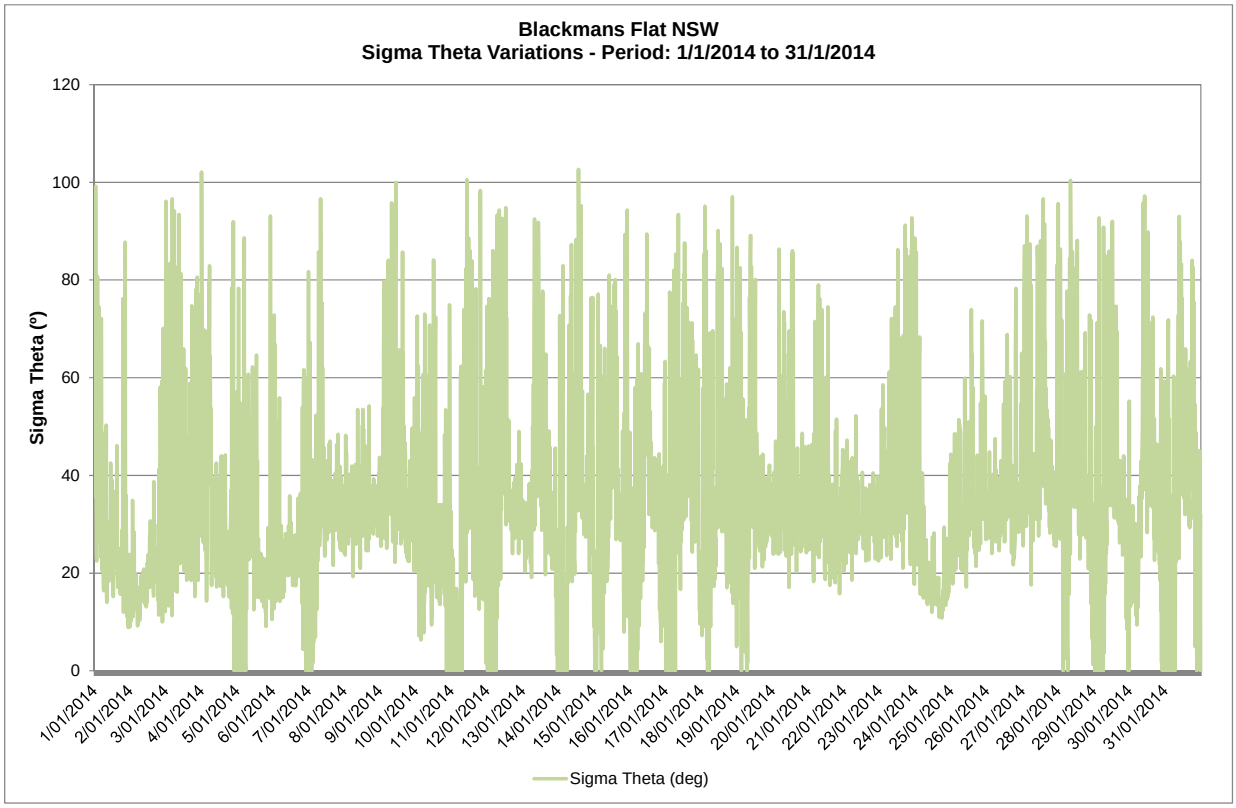
Appendix 3

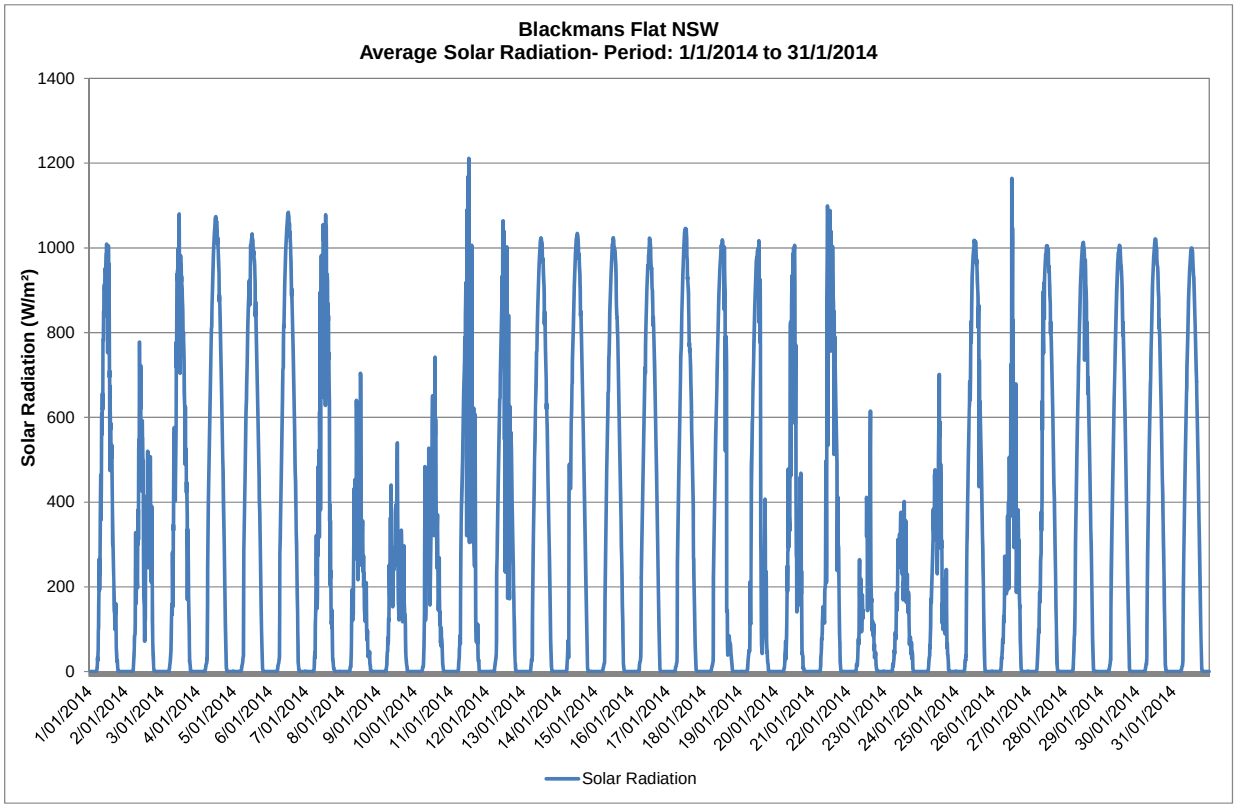
Meteorological Data

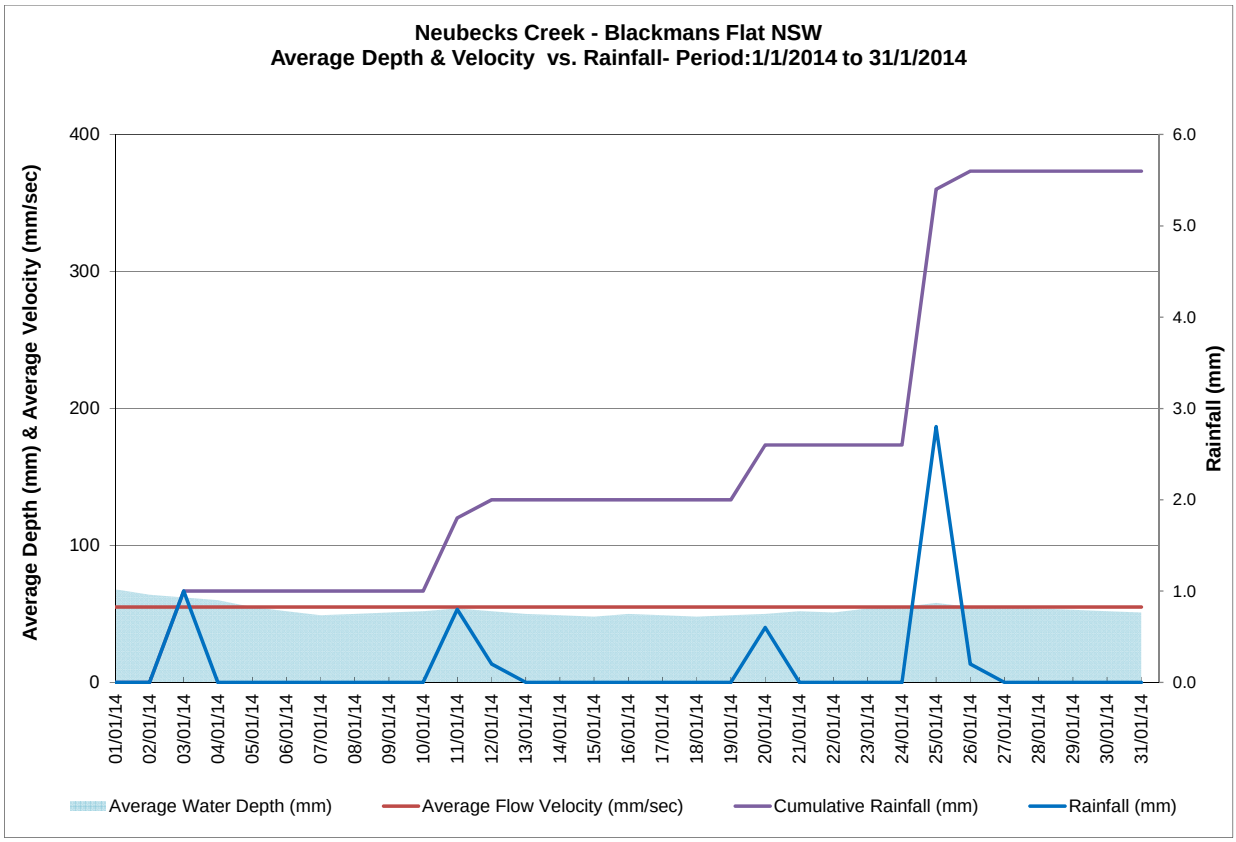

Blackmans Flat NSW
Total Rainfall & Evapotranspiration
Period: 1/1/14 to 31/1/14
Total Rainfall (mm)
Evapotranspiration ETo (mm)
Total Rainfall for January 2014: 5.6 mm
Rainfall (mm)
Evapotranspiration (mm)

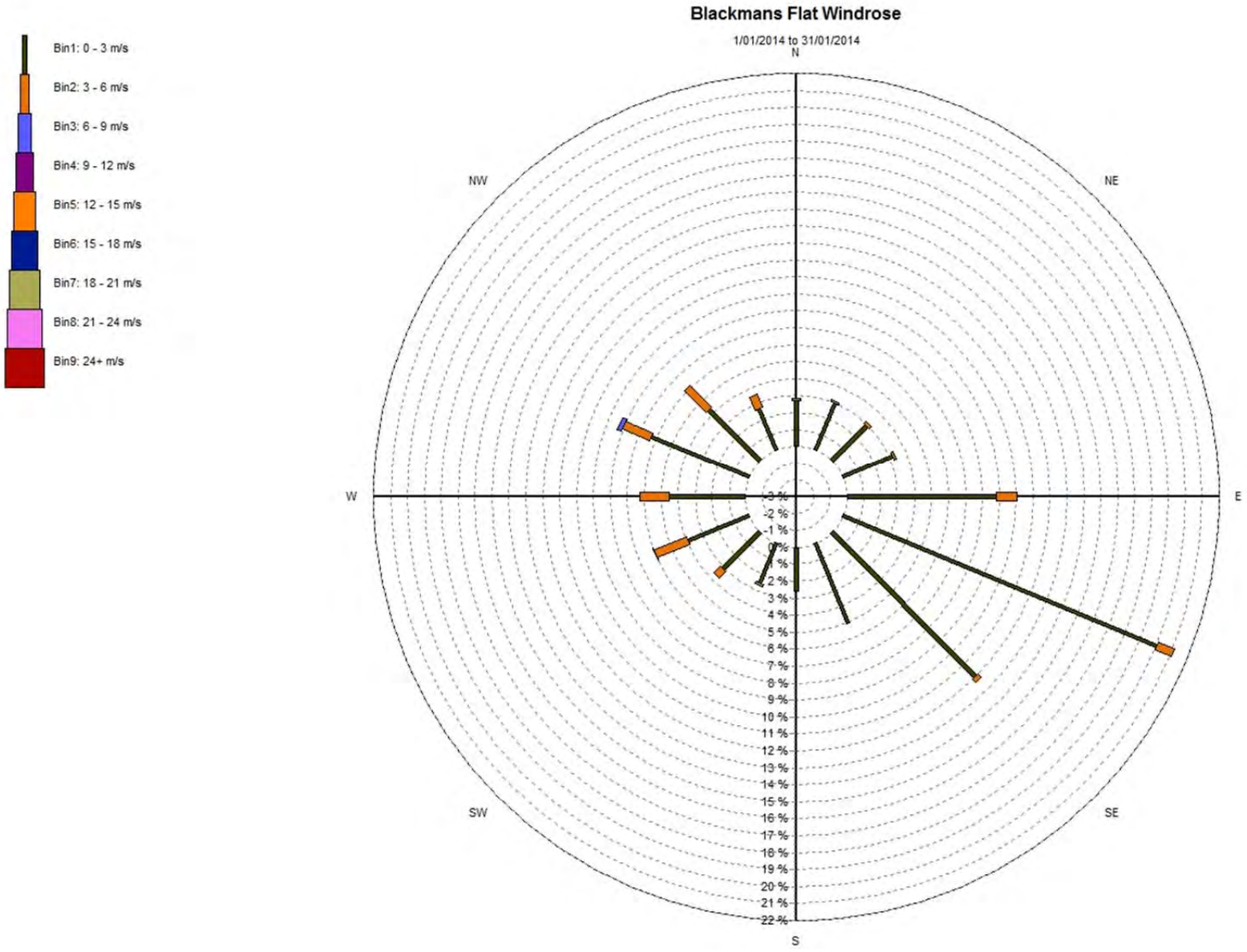

Blackmans Flat NSW
Average Air Temperature - Period: 1/1/14 to 31/1/14
Average Temperature (ºC)
Average Temperature 10m (°C)
Average Temperature 2m (°C)


Blackmans Flat NSW
Daily Humidity Variations - Period: 1/1/2014 to 31/1/2014
Humidity (%)
100
90
80
70
60
50
40
30
20
10
0
1/01/2014
2/01/2014
3/01/2014
4/01/2014
5/01/2014
6/01/2014
7/01/2014
8/01/2014
9/01/2014
10/01/2014
11/01/2014
12/01/2014
13/01/2014
14/01/2014
15/01/2014
16/01/2014
17/01/2014
18/01/2014
19/01/2014
20/01/2014
21/01/2014
22/01/2014
23/01/2014
24/01/2014
25/01/2014
26/01/2014
27/01/2014
28/01/2014
29/01/2014
30/01/2014
31/01/2014
Min Humidity 2m (%)
Ave Humidity 2m (%)
Max Humidity 2m (%)


Blackmans Flat NSW
Sigma Theta Variations - Period: 1/1/2014 to 31/1/2014
Sigma Theta (°)
120
100
80
60
40
20
0
1/01/2014
2/01/2014
3/01/2014
4/01/2014
5/01/2014
6/01/2014
7/01/2014
8/01/2014
9/01/2014
10/01/2014
11/01/2014
12/01/2014
13/01/2014
14/01/2014
15/01/2014
16/01/2014
17/01/2014
18/01/2014
19/01/2014
20/01/2014
21/01/2014
22/01/2014
23/01/2014
24/01/2014
25/01/2014
26/01/2014
27/01/2014
28/01/2014
29/01/2014
30/01/2014
31/01/2014
Sigma Theta (deg)


Blackmans Flat NSW
Average Solar Radiation- Period: 1/1/2014 to 31/1/2014
Solar Radiation (W/m²)
1400
1200
1000
800
600
400
200
0
1/01/2014
2/01/2014
3/01/2014
4/01/2014
5/01/2014
6/01/2014
7/01/2014
8/01/2014
9/01/2014
10/01/2014
11/01/2014
12/01/2014
13/01/2014
14/01/2014
15/01/2014
16/01/2014
17/01/2014
18/01/2014
19/01/2014
20/01/2014
21/01/2014
22/01/2014
23/01/2014
24/01/2014
25/01/2014
26/01/2014
27/01/2014
28/01/2014
29/01/2014
30/01/2014
31/01/2014
Solar Radiation


Neubecks Creek - Blackmans Flat NSW
Average Depth & Velocity vs. Rainfall- Period:1/1/2014 to 31/1/2014
Average Depth (mm) & Average Velocity (mm/sec)
Rainfall (mm)
400
300
200
100
0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
01/01/14
02/01/14
03/01/14
04/01/14
05/01/14
06/01/14
07/01/14
08/01/14
09/01/14
10/01/14
11/01/14
12/01/14
13/01/14
14/01/14
15/01/14
16/01/14
17/01/14
18/01/14
19/01/14
20/01/14
21/01/14
22/01/14
23/01/14
24/01/14
25/01/14
26/01/14
27/01/14
28/01/14
29/01/14
30/01/14
31/01/14
Average Water Depth (mm)
Average Flow Velocity (mm/sec)
Cumulative Rainfall (mm)
Rainfall (mm)


Blackmans Flat Windrose
1/01/2014 to 31/01/2014
Bin1: 0 - 3 m/s
Bin2: 3 - 6 m/s
Bin3: 6 - 9 m/s
Bin4: 9 - 12 m/s
Bin5: 12 - 15 m/s
Bin6: 15 - 18 m/s
Bin7: 18 - 21 m/s
Bin8: 21 - 24 m/s
Bin9: 24+ m/s
N
NE
E
SE
S
SW
W
NW
-3 %
-2 %
-1 %
1 %
2 %
3 %
4 %
5 %
6 %
7 %
8 %
9 %
10 %
11 %
12 %
13 %
14 %
15 %
16 %
17 %
18 %
19 %
20 %
21 %
22 %