



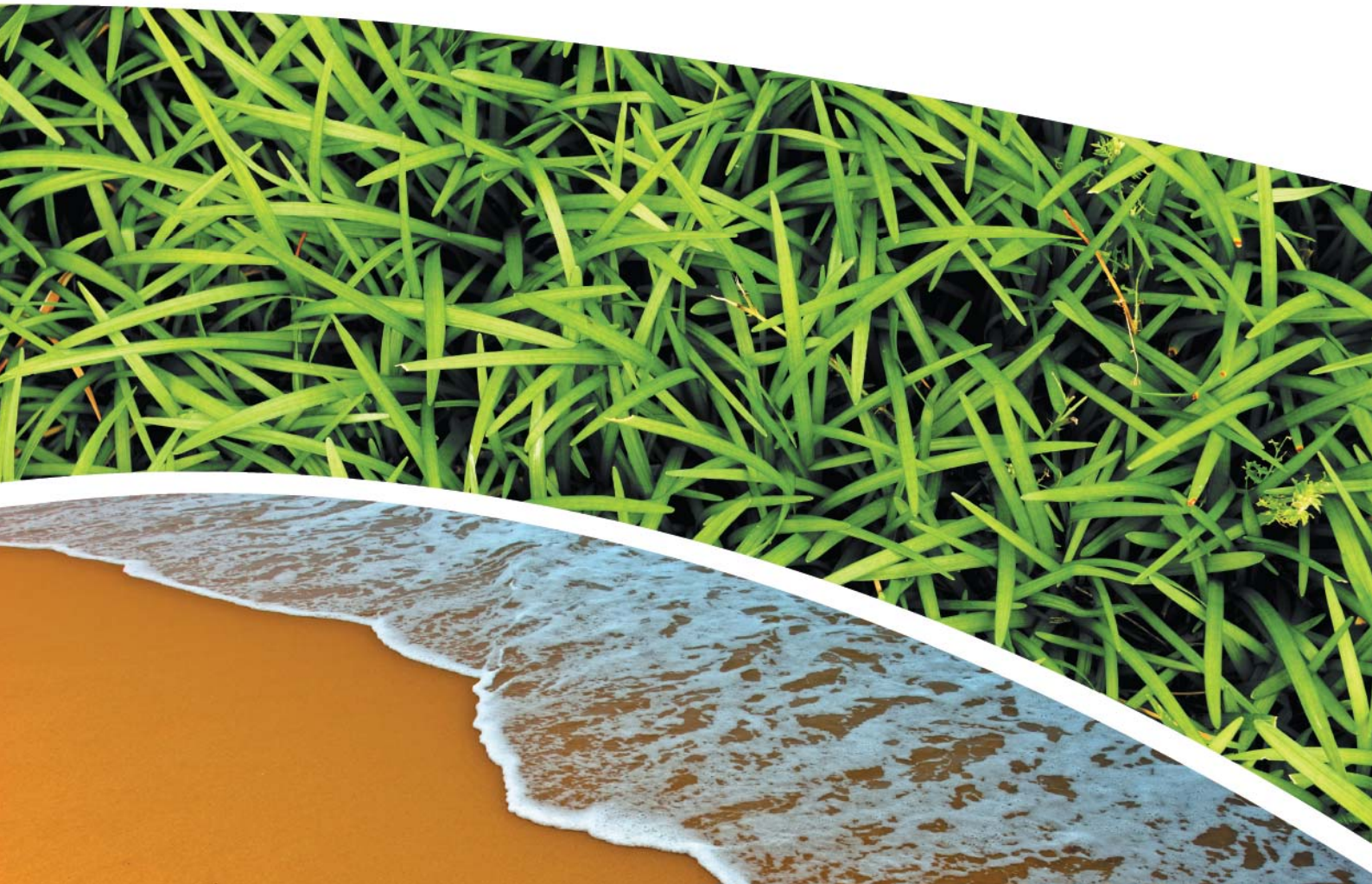
**GROUNDWATER, SURFACE WATER, DEPOSITIONAL DUST, HVAS
AND METEOROLOGICAL MONITORING**

Prepared for Pine Dale Mine Community Consultative Committee

Prepared by RCA Australia

RCA ref 6880-814/0

January 2013



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06 March 2013

Pine Dale Mine
PO Box 202
WALLERAWANG NSW 2845

Attention: Mr Hilton Goldfinch

**REPORT COMPILED FOR
PINE DALE MINE COMMUNITY CONSULTATIVE COMMITTEE
DETAILING GROUND WATER, DEPOSITIONAL DUST
HVAS AND METEOROLOGICAL MONITORING
JANUARY 2013**

1 GENERAL COMMENTS

Job Number: 6880.

Date Samples Received: During the month of January 2013.

Samples received were sampled by RCA Laboratories – Environmental staff.

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
Turbidity	ENV-LAB037	NTU	RCA Laboratories - Environmental	NATA Analysis
Oil and Grease	ENV-LAB022	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

3 WATER ANALYSIS RESULTS

3.1 GROUNDWATER

A total of 5 on-site groundwater samples were collected during the month of January 2013. No sample was collected from groundwater monitoring location P4 as the bore did not contain sufficient water to sample.

Water quality analysis results are shown in **Table 2**.

Table 2 *Groundwater Analysis Results*

ANALYSIS	UNITS	P2	P3	P6	P7	P7a
Sample Number		01136880019	01136880020	01136880010	01136880021	01136880022
Date Sampled	-	23/01/2013	23/01/2013	22/01/2013	23/01/2013	23/01/2013
Time Sampled	-	8:50	8:55	17:05	8:25	8:30
Standing Water Level	m	5.54	6.10	27.03	8.44	6.45
Standpipe Height	m	0.95	0.66	0.95	1.00	0.90
Relative Standing Water Level*	m	4.59	5.44	26.08	7.44	5.55
pH	pH unit	4.9	4.8	6.4	6.4	6.4
Conductivity	µS/cm	311	676	773	773	841

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

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 2013.

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**; PM₁₀ Suspended Particulate Matter results are shown in **Table 4**.

Table 3 Total Suspended Particulates ($\mu\text{g}/\text{m}^3$ 0°C 101.3 kPa)

RUN DATE	TSP ($\mu\text{g}/\text{m}^3$)	SAMPLE NUMBER	FILTER NUMBER	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
03-Jan-13	26	01136880046	8698446	07-Jan-13	1:35	Client	24.00
09-Jan-13	30	01136880048	8698448	11-Jan-13	10:40	Client	24.00
15-Jan-13	44	01136880050	8698450	17-Jan-13	9:35	Client	24.00
21-Jan-13	41	01136880052	8698453	23-Jan-13	7:07	Client	24.00
27-Jan-13	12	01136880055	8698456	29-Jan-13	1:25	Client	23.99

Table 4 Suspended Particulate Matter PM₁₀ ($\mu\text{g}/\text{m}^3$ 0°C 101.3 kPa)

RUN DATE	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	SAMPLE NUMBER	FILTER NUMBER	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
03-Jan-13	9	01136880047	8698447	07-Jan-13	1:35	Client	24.00
09-Jan-13	25	01136880049	8698449	11-Jan-13	10:40	Client	24.00
15-Jan-13	13	01136880051	8698452	17-Jan-13	9:35	Client	24.00
21-Jan-13	11	01136880053	8698454	23-Jan-13	7:12	Client	24.00
27-Jan-13	9	01136880054	8698455	29-Jan-13	1:25	Client	24.00

4.1.1 Allowable TSP Limits

The EPA Annual Mean TSP allowable limit is $90\mu\text{g}/\text{m}^3$. All TSP HVAS results recorded during this monitoring period are in compliance with consent conditions, as the *current rolling annual mean* (from February 2012 to January 2013) for the TSP unit is $25.3\mu\text{g}/\text{m}^3$, which is well below the allowable limit of $90\mu\text{g}/\text{m}^3$.

4.1.2 Allowable PM₁₀ Limits

The EPA 24h Maximum PM₁₀ allowable limit is 50µg/m³. The EPA Annual Mean PM₁₀ allowable limit is 30µg/m³. All PM₁₀ HVAS results recorded during this monitoring period conform to consent conditions, as the *current rolling annual mean* for the PM₁₀ unit is 11.2µg/m³, which is below the allowable limit of 30µg/m³. The 24 hour maximum allowable limit of 50µg/m³ was not exceeded on any run day during the January 2013 monitoring period.

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 2013*

SAMPLE NO	DEPOSIT GAUGE	DATE SAMPLE STARTED	DATE SAMPLE COMPLETED	NO OF DAYS	NOTES	INSOLUBLE SOLIDS (g/m ² /month)	ASH (g/m ² /month)	COMBUSTIBLE MATTER (g/m ² /month)
01136880033	D1	21/12/2012	22/01/2013	32	I	0.9	0.5	0.4
01136880034	D2	21/12/2012	22/01/2013	32	I	0.6	0.2	0.4
01136880035	D3	21/12/2012	22/01/2013	32	I	1.0	0.6	0.4
01136880036	D4	21/12/2012	22/01/2013	32	I	0.4	0.2	0.2
01136880037	D5	21/12/2012	22/01/2013	32	I	0.4	0.2	0.2
01136880038	D6	21/12/2012	22/01/2013	32	I	0.5	0.3	0.2

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/m² 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 1.0g/m² per month, which is below the allowable Annual Average Long Term Limit of 4g/m² per month.

Depositional Dust monitoring locations are shown in **Appendix 1**.

Graphical Depositional Dust results are shown in **Appendix 2**.

4.3 BLASTING

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

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

Date	<i>Park</i>		<i>Noon St.</i>		<i>Summer St.</i>	
	Overpressure (dB)	Vibration (mm/sec)	Overpressure (dB)	Vibration (mm/sec)	Overpressure (dB)	Vibration (mm/sec)
10/01/2013	NT	NT	99.1	0.09	98.4	0.10
17/01/2013	NT	NT	110.9	0.65	108.4	0.67
24/01/2013	NT	NT	111.1	1.95	110.5	1.81
31/01/2013	NT	NT	108.0	0.12	100.2	0.11
2012- 2013 Year to Date Information						
Minimum	103.9	0.32	99.1	0.09	95.70	0.10
Average	109.5	1.90	109.3	1.20	108.90	1.50
Maximum	114.6	3.87	114.4	2.69	116.30	4.58
% > EPL 95% Compliance Criteria	0%	0%	0%	0%	3%	0%
% > EPL 100% Compliance Criteria	0	0	0%	0%	0%	0%

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

N/A Not Applicable. No blasts have been triggered at this site thus far in the reporting period.

4.3.1 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 2012 to January 2013.

During January 2013, there were nil exceedances of the EPL conditions for both overpressure and vibration levels. For the rolling annual average, there have been zero blasts which 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 blasting results from overpressure and vibration are presented in **Appendix 2**.

5 SUMMARY

During the month of January 2013 all environmental monitoring constituents were found to be in compliance with EPL 4911.

Quarterly surface waters were not scheduled to be sampled this month. Surface water Quality monitoring is next scheduled to be undertaken in February 2013.

Rolling annual averages from both the TSP and PM₁₀ High Volume Air Samplers are currently well below the EPA Annual Mean TSP and PM₁₀ criterion of 90µg/m³ and 30µg/m³ respectively. There were zero exceedances of the PM₁₀ short term impact assessment criteria of 50µg/m³ over twenty-four hours during January 2013.

Currently there are no depositional dust gauge results which are greater than the EPA Long Term (annual average) criteria of 4g/m²/month based upon a rolling average of the past 12 months.

During January there were nil exceedances of the blasting requirements documented in the Pine Dale Mine EPL. During the 2012- 2013 reporting period, there were nil non-conformance's based upon the 95% or 100% limits for either overpressure or vibration levels.

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Please contact the undersigned if you have any queries.

Yours sincerely



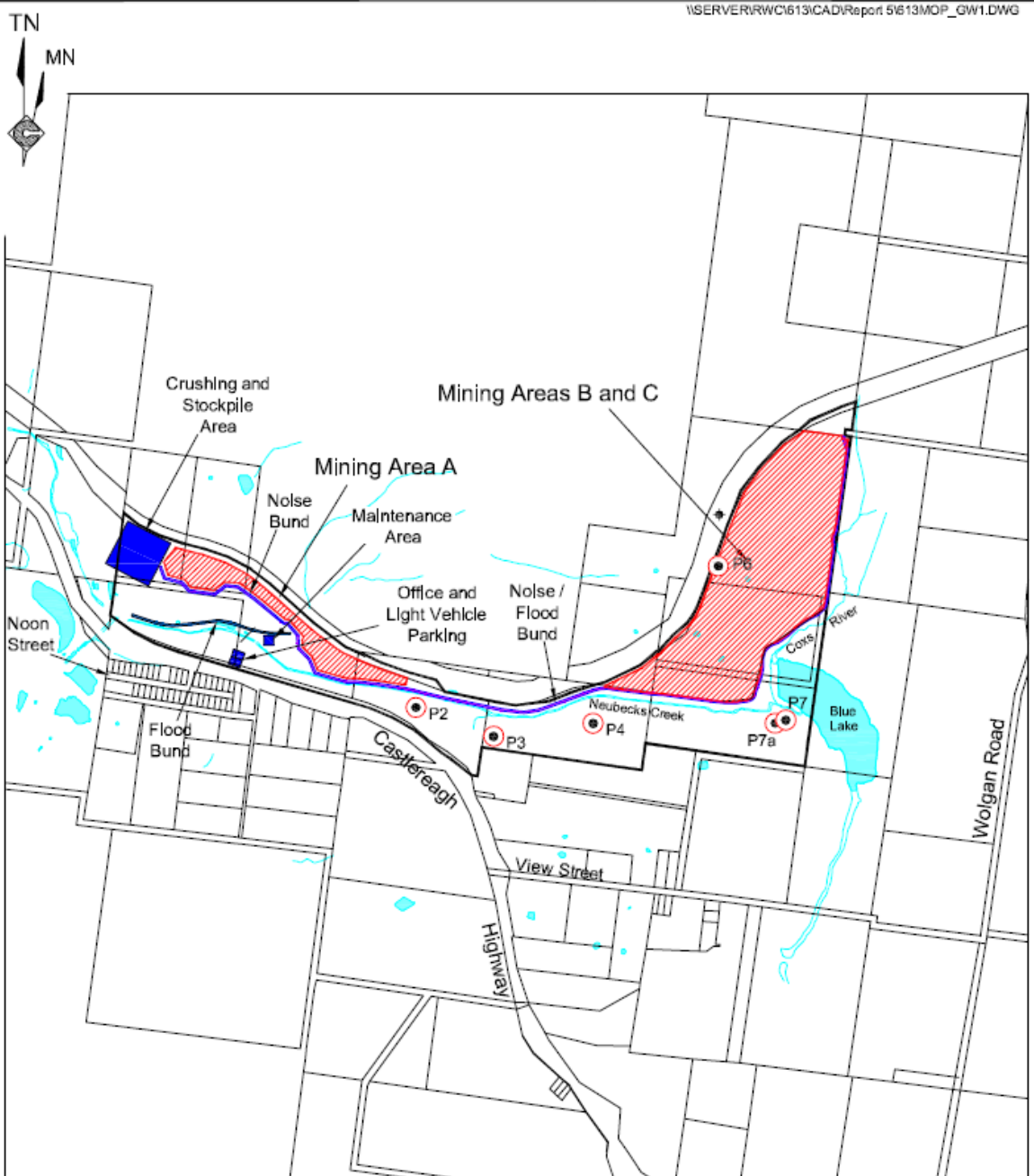
Katy Shaw
Environmental Scientist
RCA Australia Pty Ltd trading as
RCA Laboratories – Environmental



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

Appendix 1

Groundwater and Air Quality Monitoring Locations



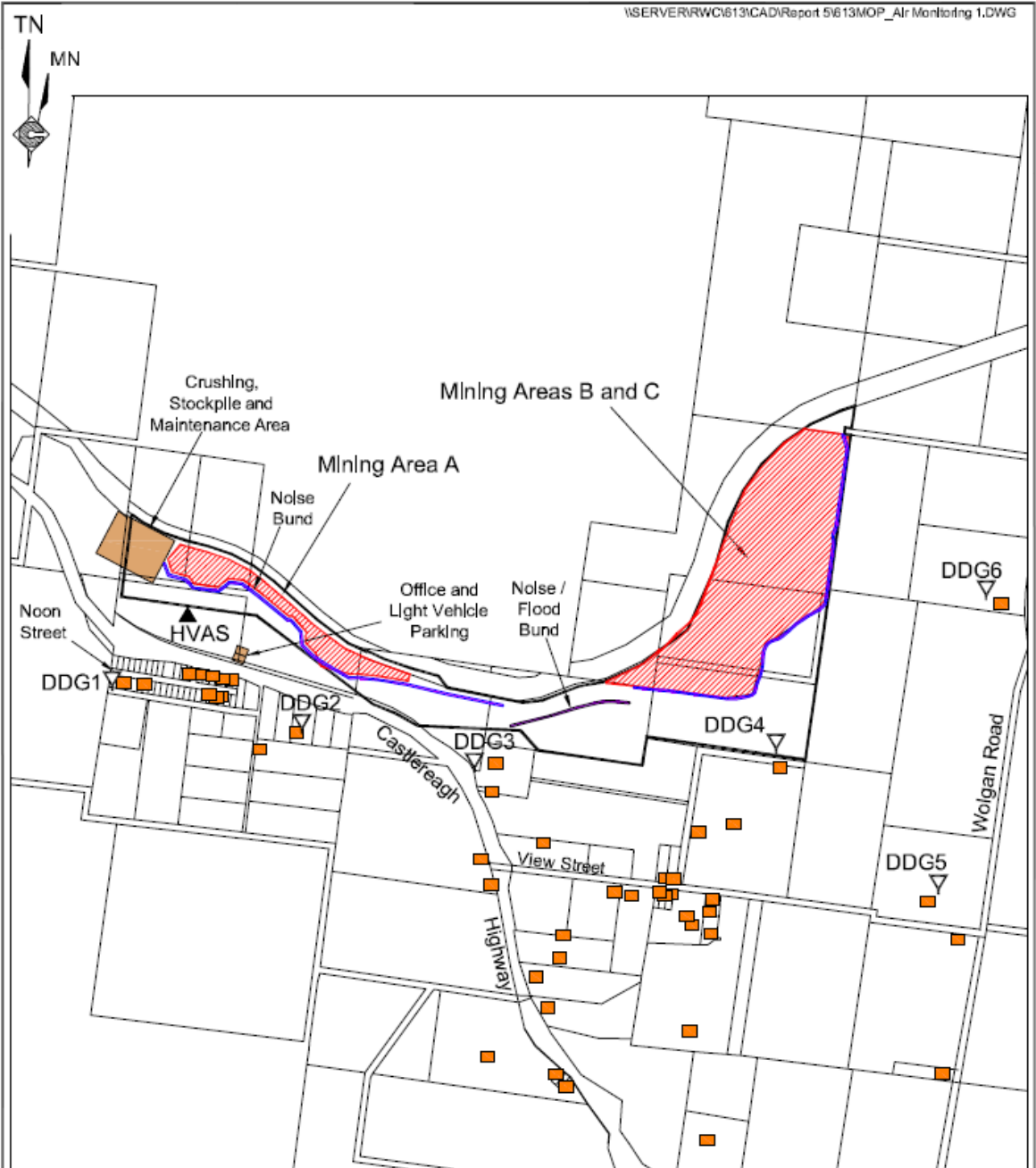
REFERENCE
— Mine Site Boundary (ML_XYZ)
● P4 Groundwater Monitoring Location

SCALE 1:20 000



Figure GW1
GROUNDWATER MONITORING LOCATIONS





REFERENCE
 — Mine Lease Boundary (ML1578)
 ■ Residence
 DDG1 ▽ Air Quality Monitoring Location (Deposited Dust)
 HVAS ▲ Air Quality Monitoring Location (High Volume Sampling)

SCALE 1:20 000

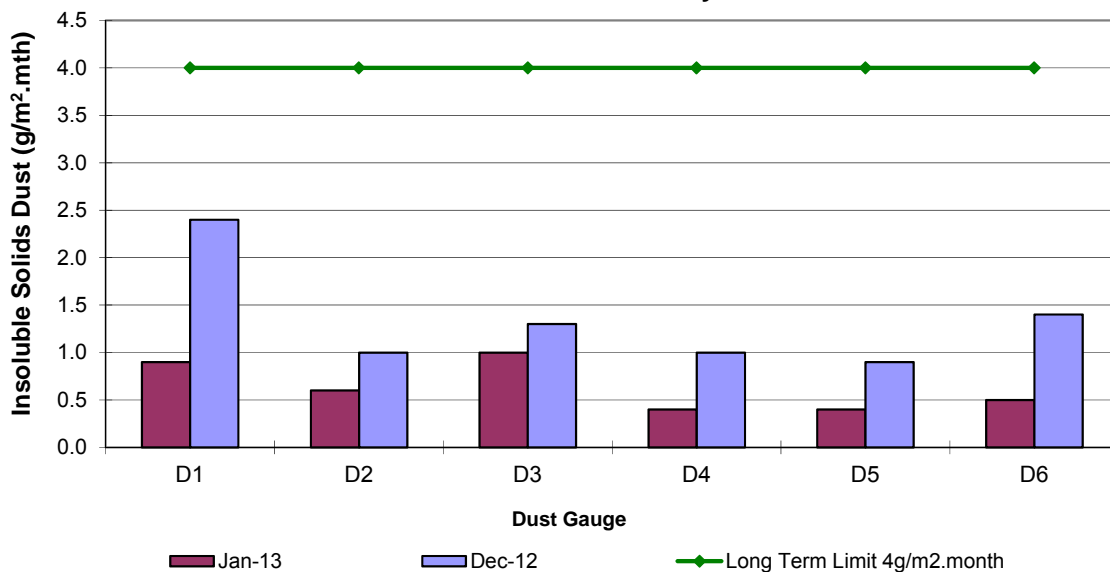


Figure AQ1
AIR QUALITY MONITORING LOCATIONS

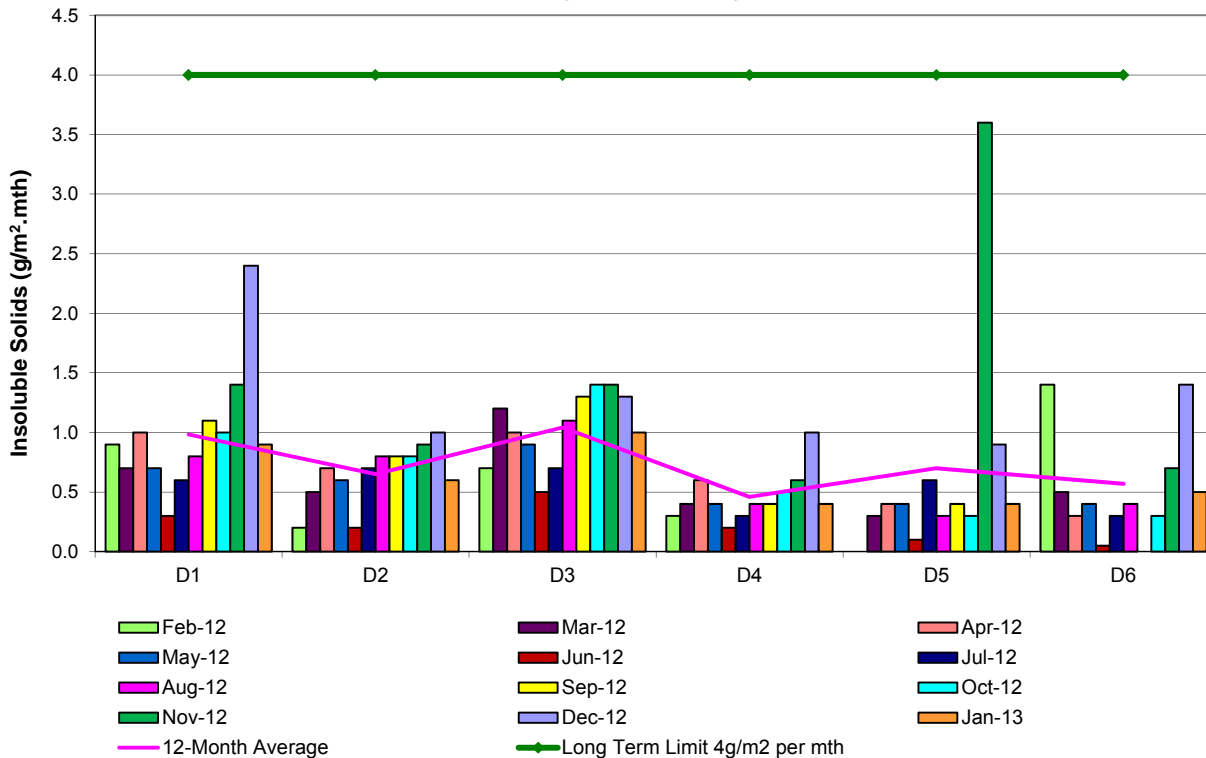
Appendix 2

Depositional Dust, HVAS and Blast Result Graphs

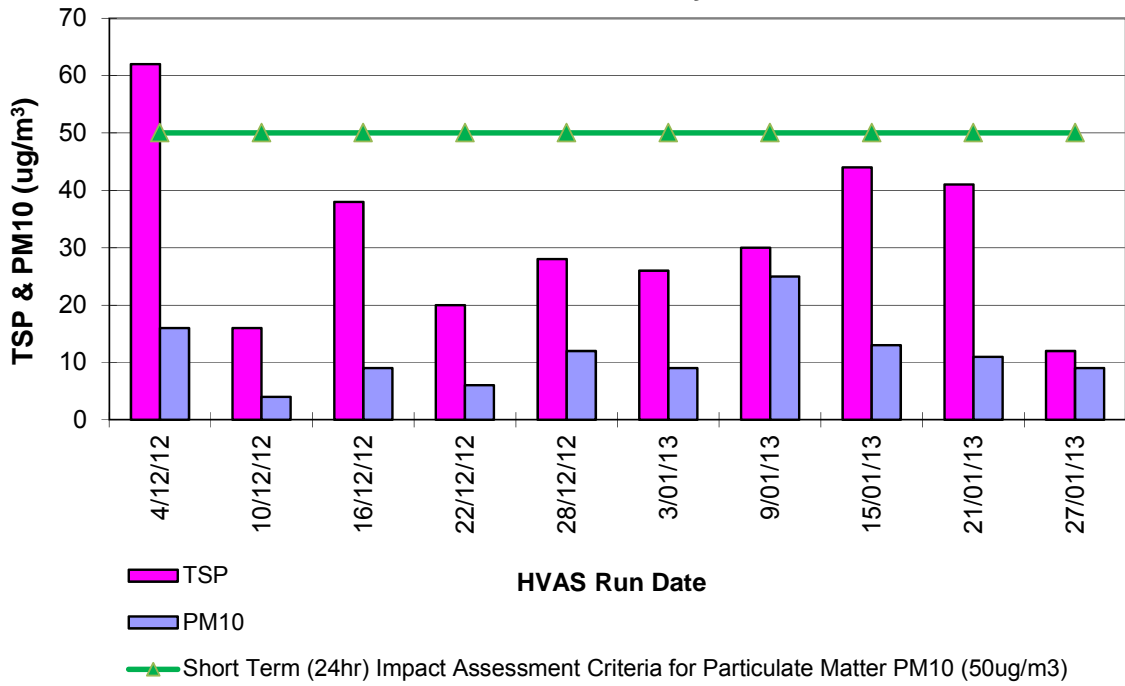
**Pine Dale Mine
Depositional Dust Gauge Comparative Results
December 2012 - January 2013**



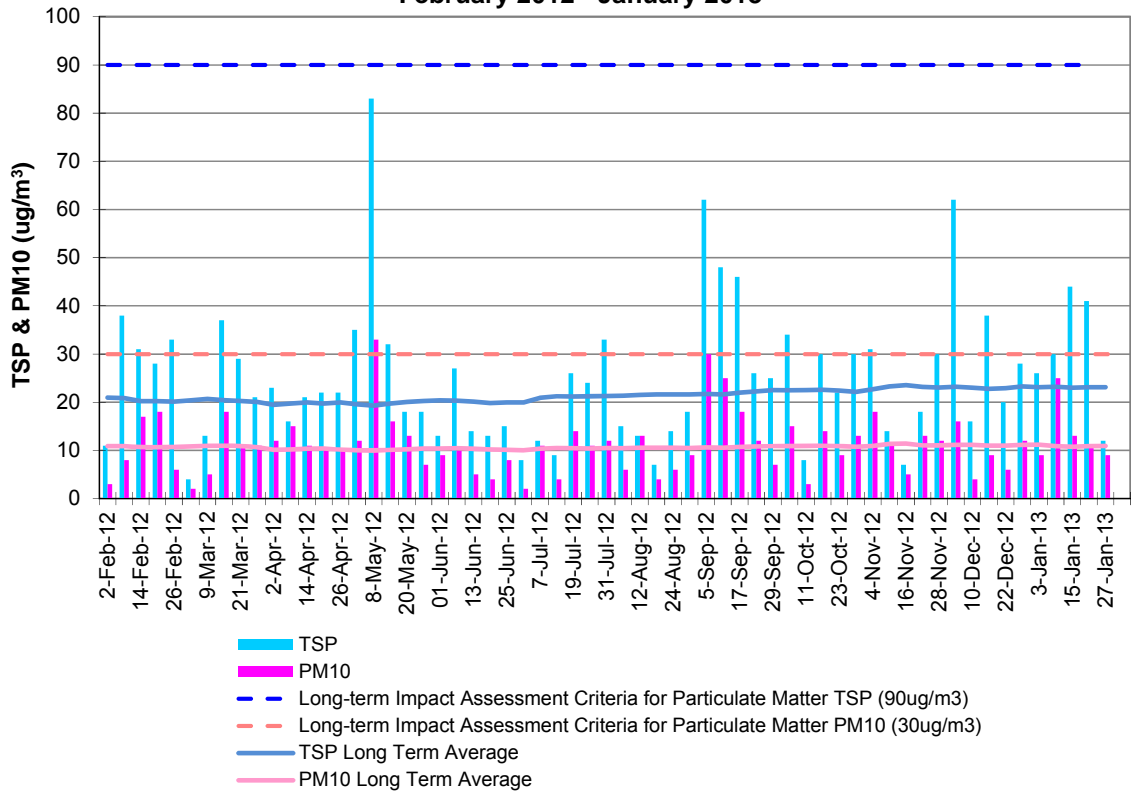
**Pine Dale Mine
Deposited Matter - Insoluble Solids 12 Months Comparative Results
February 2012- January 2013**



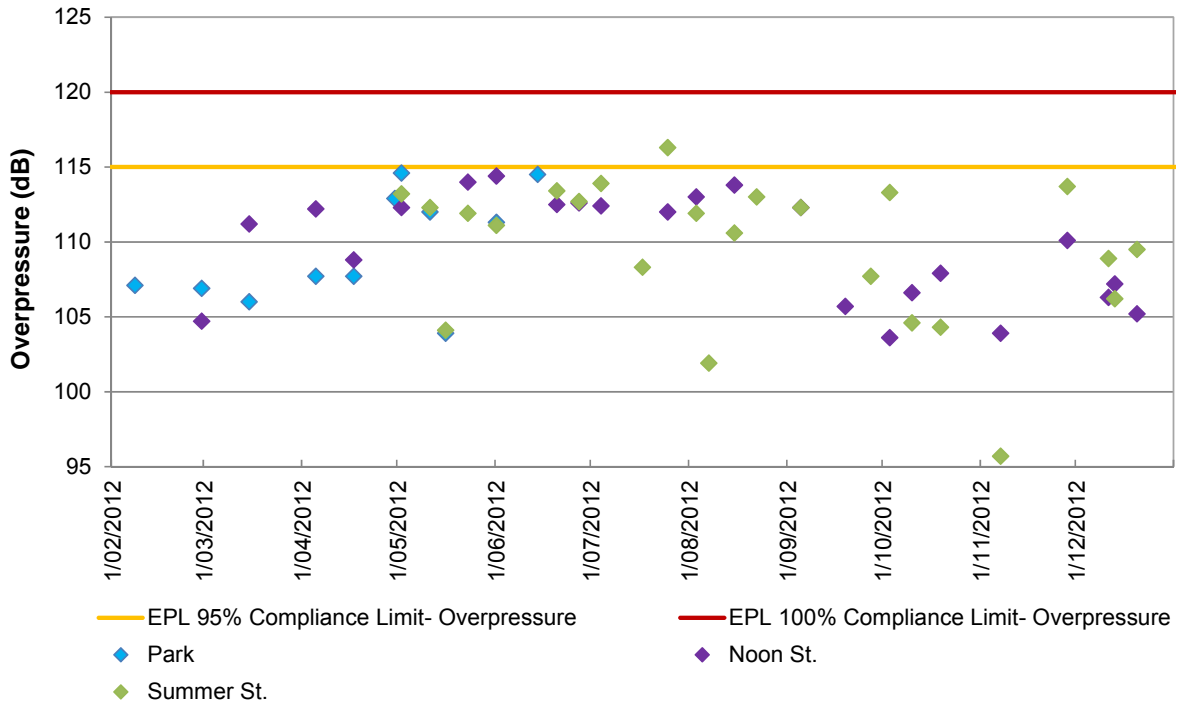
**Pine Dale Mine
TSP & PM10 Results
December 2012 - January 2013**



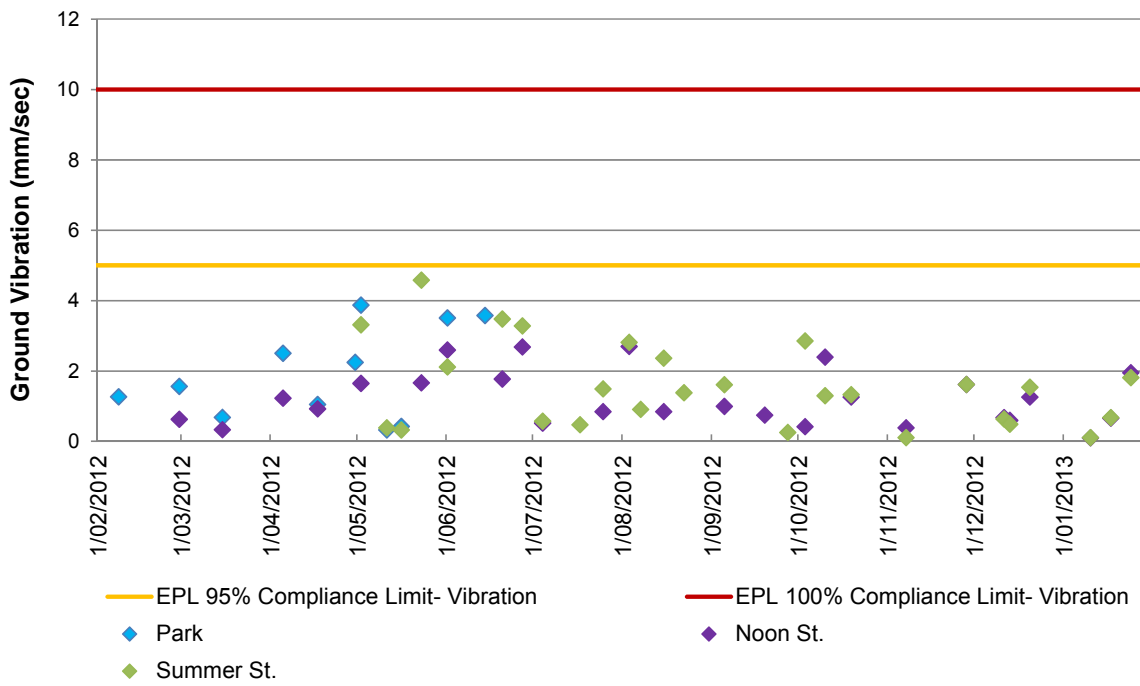
**Pine Dale Mine
TSP & PM10 HVAS 12-Month Comparative Results
February 2012 - January 2013**



**Pine Dale Mine
Blasting- Airblast Overpressure
February 2012- January 2013 Comparable Data**



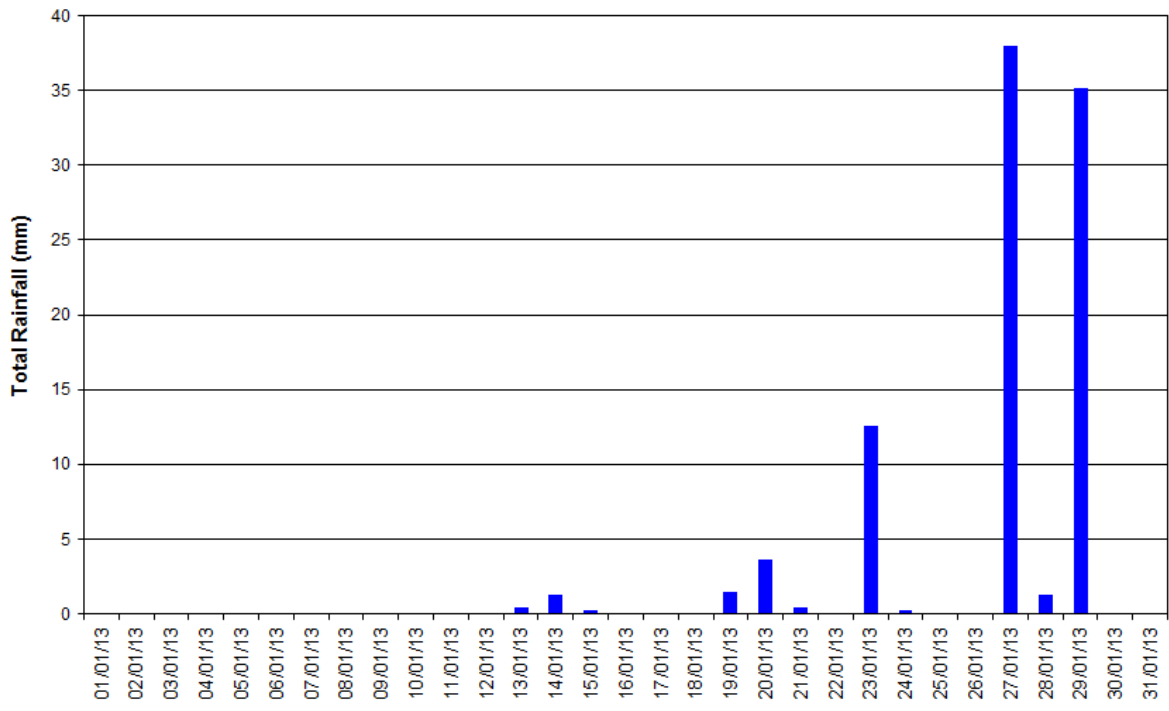
**Pine Dale Mine
Blasting- Ground Vibration
February 2012- January 2013 Comparable Data**



Appendix 3

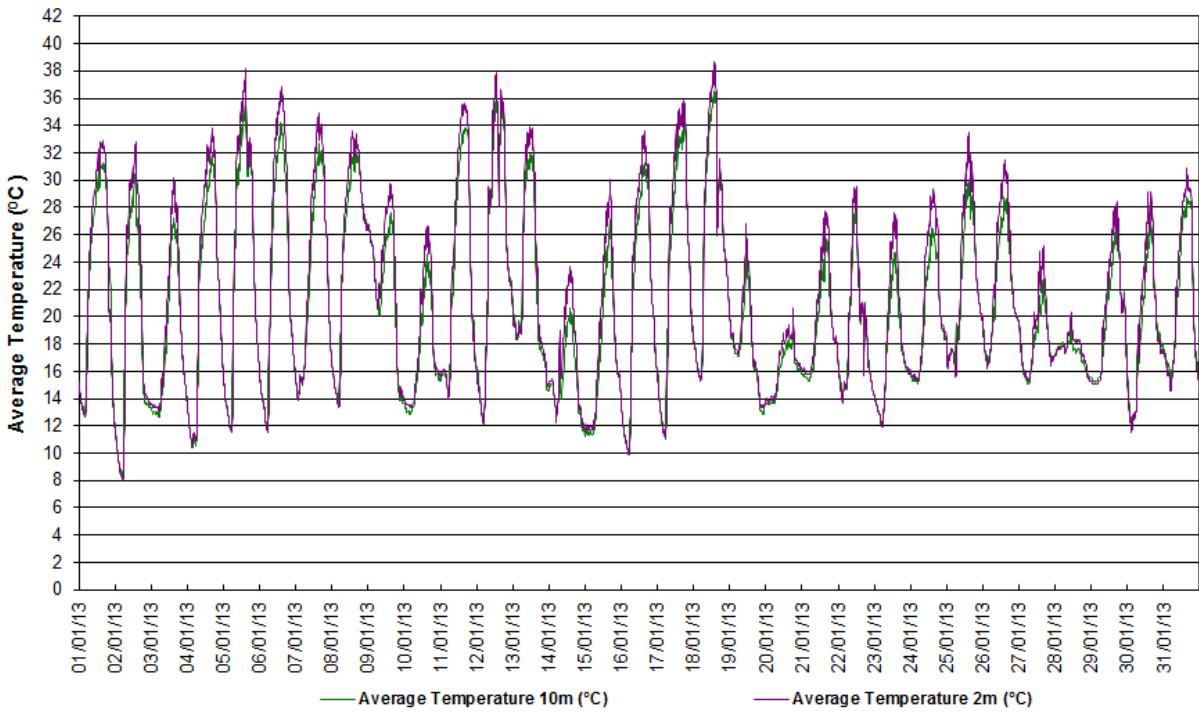
Meteorological Data

Blackmans Flat NSW
Total Rainfall - Period: 1/01/2013 to 31/01/2013



Total Rainfall for January 2013: 94.4 mm

Blackmans Flat NSW
Average Air Temperature - Period: 1/01/2013 to 31/01/2013



Neubecks Creek - Blackmans Flat NSW
Average Depth & Velocity vs. Rainfall- Period: 1/01/2013 to 31/01/2013

