



Geotechnical Engineering

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Engineering Geology

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Hydrogeology

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Contaminated Site Assessment

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Construction Materials Testing

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Environmental Monitoring

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# **GROUND WATER DEPOSITIONAL DUST HVAS AND METEOROLOGICAL MONITORING**

## **PINE DALE MINE**

**Prepared for  
PINE DALE MINE COMMUNITY  
CONSULTATIVE COMMITTEE**

**Prepared by  
RCA AUSTRALIA**

**RCA-LE ref 6880-796/0**

**May 2012**

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RCA LE ref 6880-796/0



3 July 2012

Enhance Place Pty Ltd  
Pine Dale Mine  
PO Box 6095  
South Coast Mail Centre  
WOLLONGONG NSW 2521

Attention: Mr Hilton Goldfinch

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**REPORT COMPILED FOR  
PINE DALE MINE COMMUNITY CONSULTATIVE COMMITTEE  
DETAILING  
GROUND WATER, DEPOSITIONAL DUST  
HVAS AND METEOROLOGICAL MONITORING  
MAY 2012**

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## 1 GENERAL COMMENTS

Job Number: 6880.

Date Samples Received: During the month of May 2012.

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	ENV-LAB003	µg/m <sup>3</sup>	RCA Laboratories - Environmental	NATA Analysis
Determination of Particulate Matter –	ENV-LAB004	g/m <sup>2</sup> /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
Turbidity	ENV-LAB037	NTU	RCA Laboratories - Environmental	NATA Analysis
Major Anions (Alkalinity, Cl, SO <sub>4</sub> )	ED037, ED041, ED045	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 May 2012. 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		05126880022	05126880023	05126880011	05126880024	05126880025
Date Sampled	-	30/05/12	30/05/12	30/05/12	30/05/12	30/05/12
Time Sampled	-	15:10	15:00	13:40	14:05	14:10
Standing Water Level	m	5.40	6.00	27.13	8.30	5.22
Standpipe Height	m	0.95	0.66	0.95	1.00	0.90
Relative Standing Water Level*	m	4.45	5.34	26.18	7.30	4.32
pH	pH unit	4.85	4.93	6.64	6.62	6.60
Conductivity	µS/cm	347	369	600	683	780

**NOTES:**

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

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

### 3.2 EPA SURFACE WATER

Routine quarterly surface water monitoring was undertaken during the month of May 2012 at three surface water sites. Water quality analysis results are shown in **Table 3**.

**Table 3** *EPA Surface Water Analysis Results*

ANALYSIS	UNITS	EPA Point 2 Neubeck's Ck Upstream	EPA Point 3 Neubeck's Ck Downstream	EPA Point 14 Cox's River Downstream
Sample Number	-	05126880020	05126880015	05126880021
Date Sampled	-	30/05/12	30/05/12	30/05/12
Time Sampled	-	16:55	14:20	16:27
Temperature	°C	8.0	9.5	9.5
Flow	-	Med/Low	Med/Low	Med/Low
pH	pH	8.1	7.3	7.8
Conductivity	µS/cm	383	620	819
Turbidity	NTU	5.6	4.2	13.1
Total Suspended Solids	mg/L	1.5	4	3
Sulfate	mg/L	99	639	173
Dissolved Iron	mg/L	0.08	0.35	0.21

## 4 AIR QUALITY MONITORING RESULTS

### 4.1 HIGH VOLUME AIR SAMPLERS (HVAS)

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

HVAS Total Suspended Particulate analysis results are shown in **Table 4**; PM<sub>10</sub> Suspended Particulate Matter results are shown in **Table 5**.

**Table 4** *Total Suspended Particulates (µg/m<sup>3</sup> 0°C 101.3 kPa)*

RUN DATE	TSP (µg/m <sup>3</sup> )	SAMPLE NO	FILTER NO	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
2-May-12	35	04126880032	8365702	03-May-12	11:30	Client	24.00
8-May-12	83	04126880033	8365703	11-May-12	9:05	Client	24.00
14-May-12	32	04126880034	8365704	16-May-12	12:40	Client	24.00
20-May-12	18	04126880035	8365705	23-May-12	10:30	Client	24.00
26-May-12	18	04126880036	8365706	30-May-12	10:05	Client	24.00

**Table 5** *Suspended Particulate Matter PM<sub>10</sub> (µg/m<sup>3</sup> 0°C 101.3 kPa)*

RUN DATE	PM10 (µg/m <sup>3</sup> )	SAMPLE NO	FILTER NO	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
2-May-12	12	05126880049	8365703	3-May-12	11:30	Client	24.00
8-May-12	33	05126880051	8579170	11-May-12	9:05	Client	24.00
14-May-12	16	05126880053	8579168	16-May-12	12:40	Client	24.00
20-May-12	13	05126880055	8579166	23-May-12	10:30	Client	24.00
26-May-12	7	05126880057	8579164	30-May-12	10:05	Client	24.00

#### 4.1.1 Allowable TSP Limits

The EPA Annual Mean TSP limit is 90µg/m<sup>3</sup>. All TSP HVAS results during this monitoring period are in compliance with consent conditions, as the *current annual mean* (from Jun 2011 to May 2012) for the TSP unit is 21.2µg/m<sup>3</sup>, which is well below the allowable limit of 90µg/m<sup>3</sup>.

#### 4.1.2 Allowable PM10 Limits

The EPA 24h Maximum PM<sub>10</sub> Limit is 50µg/m<sup>3</sup>. The EPA Annual Mean PM<sub>10</sub> limit is 30µg/m<sup>3</sup>. All PM<sub>10</sub> HVAS results during this monitoring period are in compliance with consent conditions, as the *current annual mean* for the PM<sub>10</sub> unit is 10.4µg/m<sup>3</sup>, which is below the allowable limit of 30µg/m<sup>3</sup> and the 24 hour maximum was not exceeded on any run day during the month.

#### 4.1.3 Comments

High Volume Air Sampler calibrations were performed on the 31/05/2012.

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 6**.

**Table 6** *Deposited Matter (g/m<sup>2</sup>/month)*

SAMPLE NO	DEPOSIT GAUGE	DATE SAMPLE STARTED	DATE SAMPLE COMPLETED	NO OF DAYS	NOTES	INSOLUBLE SOLIDS (g/m <sup>2</sup> /month)	ASH (g/m <sup>2</sup> /month)	COMBUSTIBLE MATTER (g/m <sup>2</sup> /month)
05126880035	6880-D1	1/05/2012	30/05/2012	29	I	0.7	0.4	0.3
05126880036	6880-D2	1/05/2012	30/05/2012	29	I	0.6	0.3	0.3
05126880037	6880-D3	1/05/2012	30/05/2012	29	I	0.9	0.6	0.3
05126880038	6880-D4	1/05/2012	30/05/2012	29	I	0.4	0.2	0.2
05126880039	6880-D5	1/05/2012	30/05/2012	29	I	0.4	0.2	0.2
05126880040	6880-D6	1/05/2012	30/05/2012	29	I	0.4	0.2	0.2

### 4.2.1 Glossary of Terms Used in Notes

I Insects

### 4.2.2 Allowable Depositional Dust Limits:

The EPA Long Term (Annual Average) Dust Limit is 4g/m<sup>2</sup> 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 all are all less than 0.9g/m<sup>2</sup> per month, which is below the allowable Annual Average Long Term Limit of 4g/m<sup>2</sup> per month.

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

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



*This report must not be reproduced except in full. Results or figures from this report must not be used without acknowledgment.*

Please contact the undersigned if you have any queries.

Yours sincerely



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

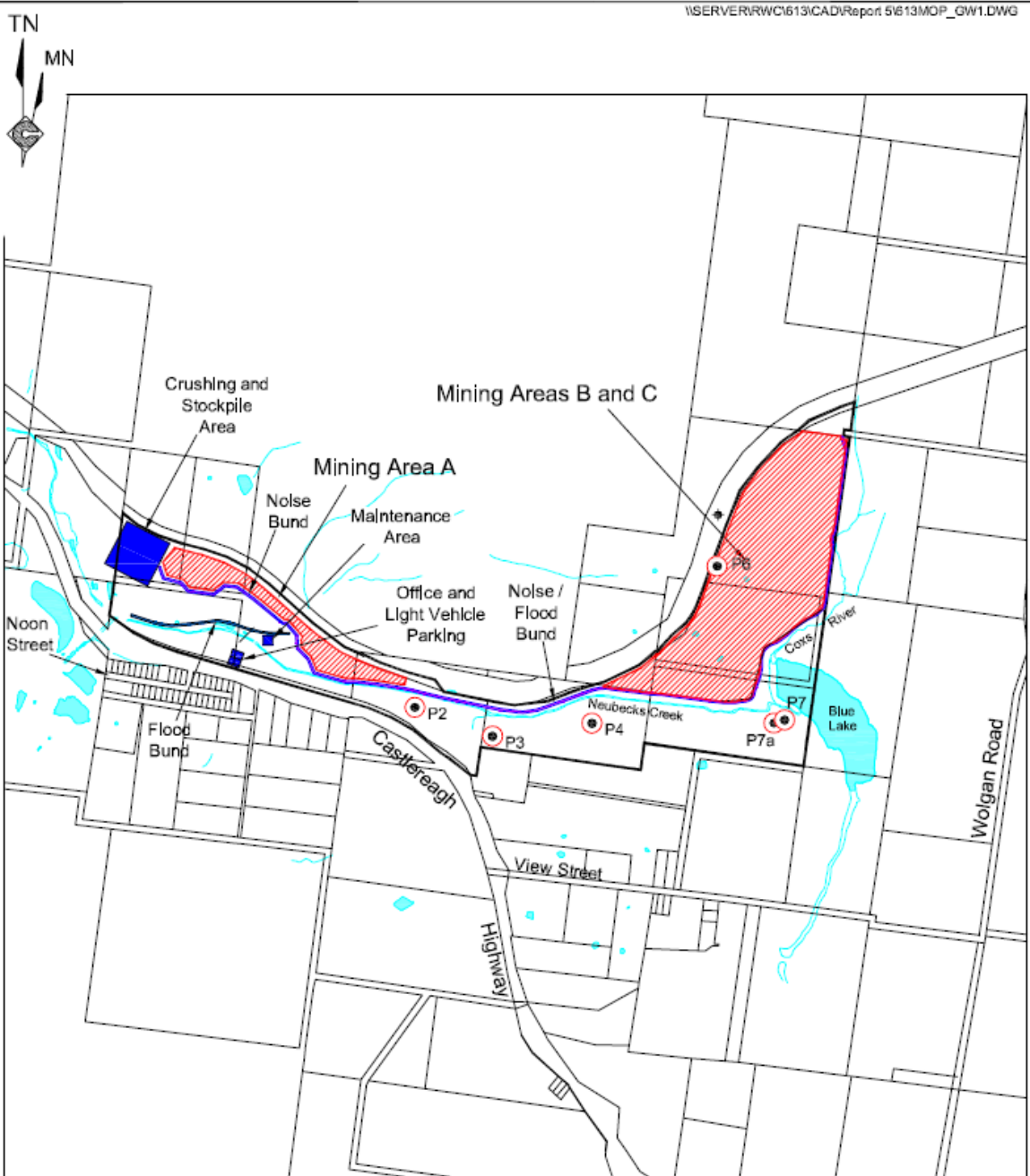


Karen Tripp  
Senior Environmental Scientist / Hygienist  
RCA Australia Pty Ltd trading as  
RCA Laboratories – Environmental

# Appendix 1

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## Groundwater and Air Quality Monitoring Locations



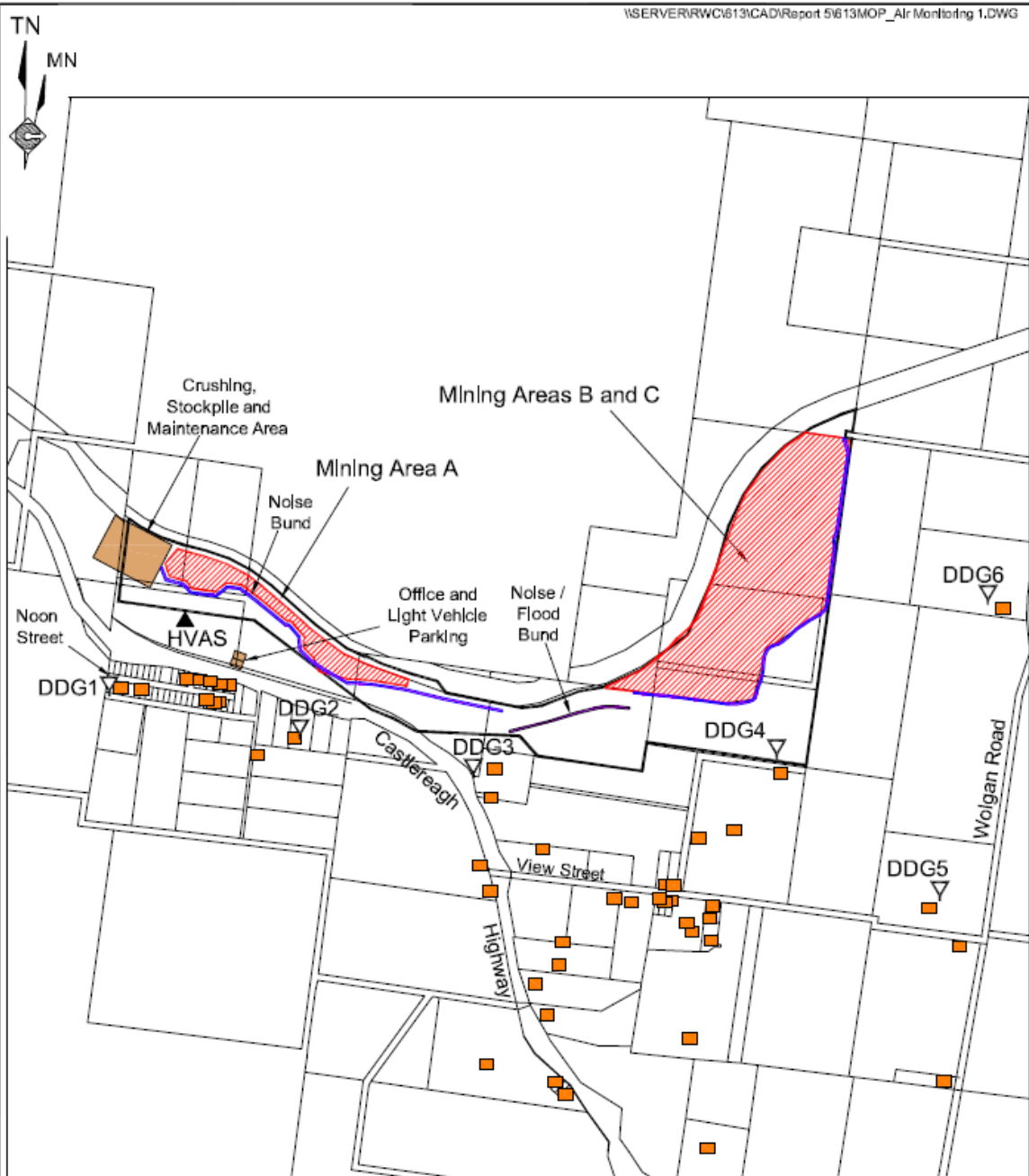
REFERENCE  
 — Mine Site Boundary (ML\_XYZ)  
 ● P4 Groundwater Monitoring Location

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

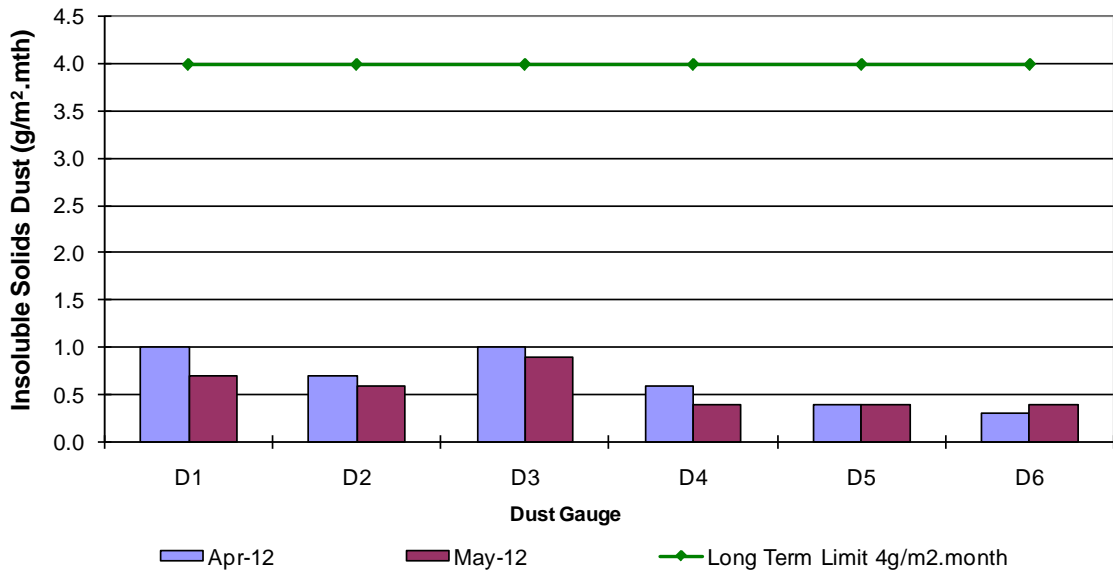


# Appendix 2

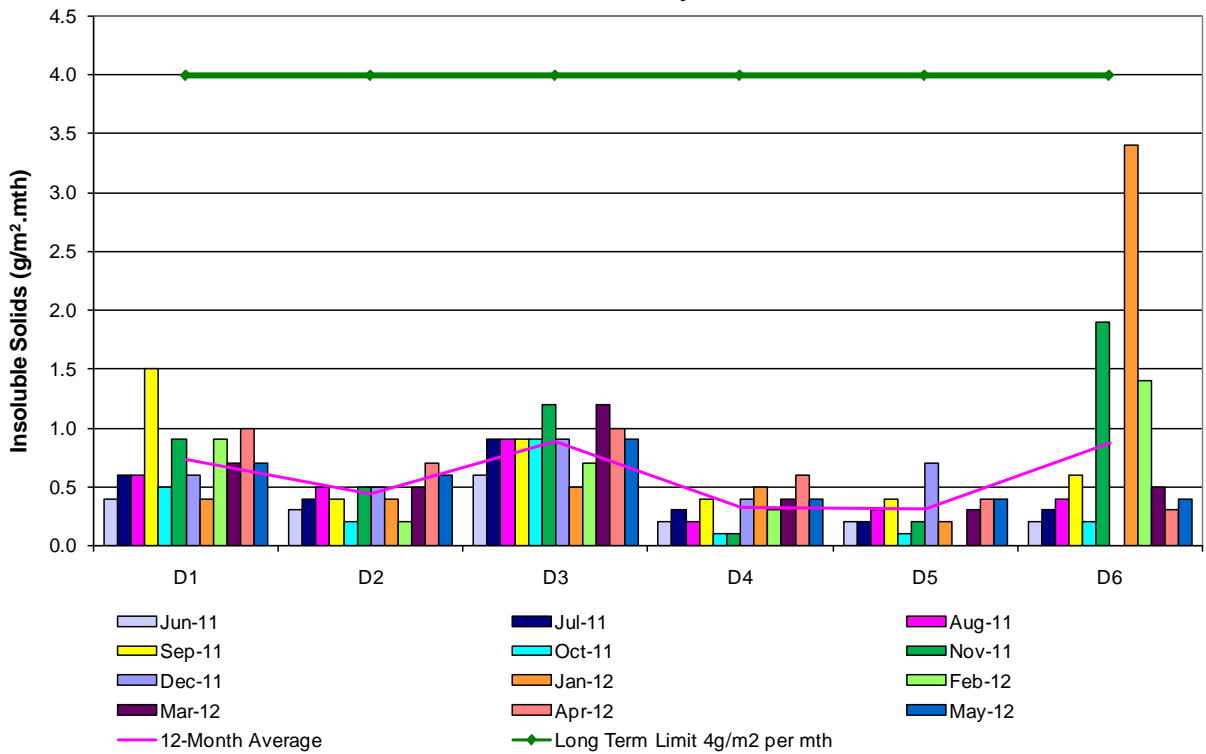
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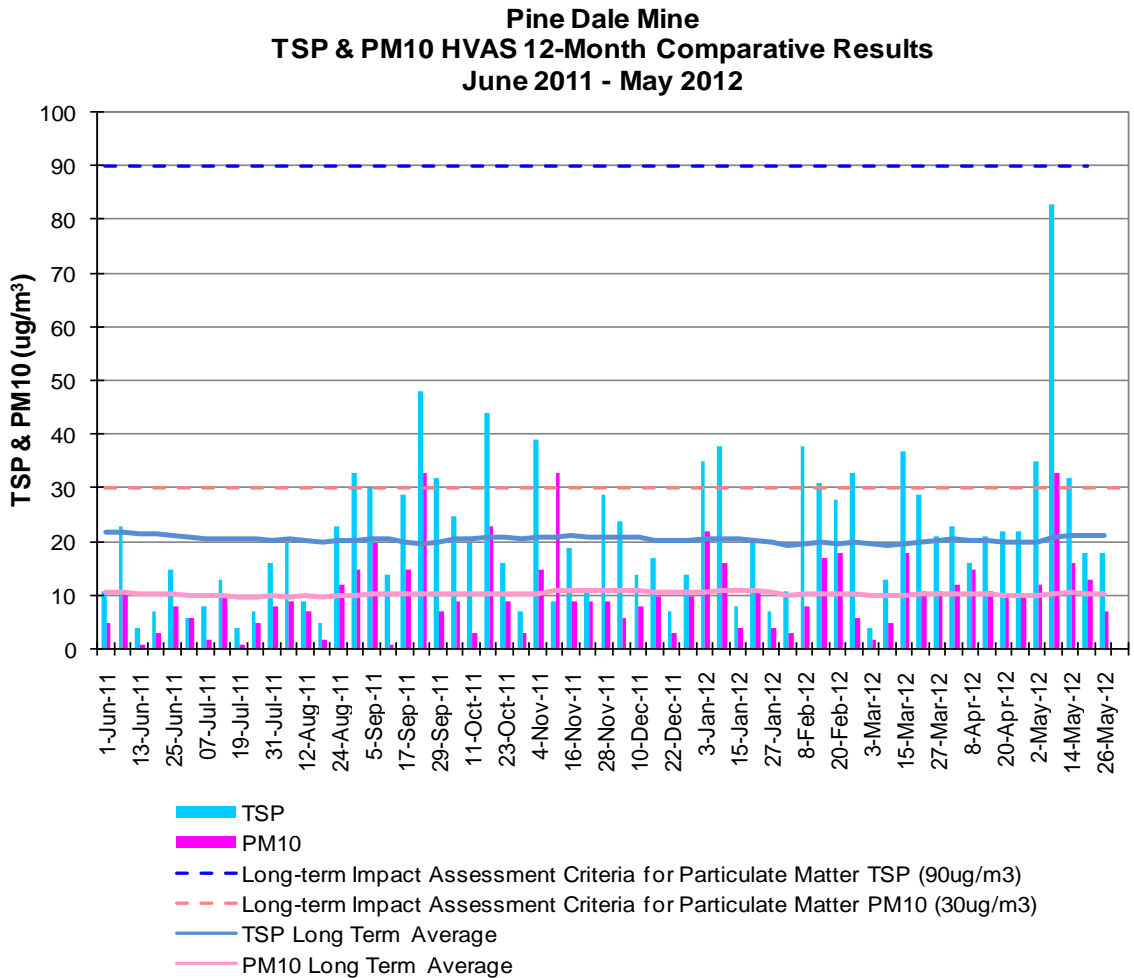
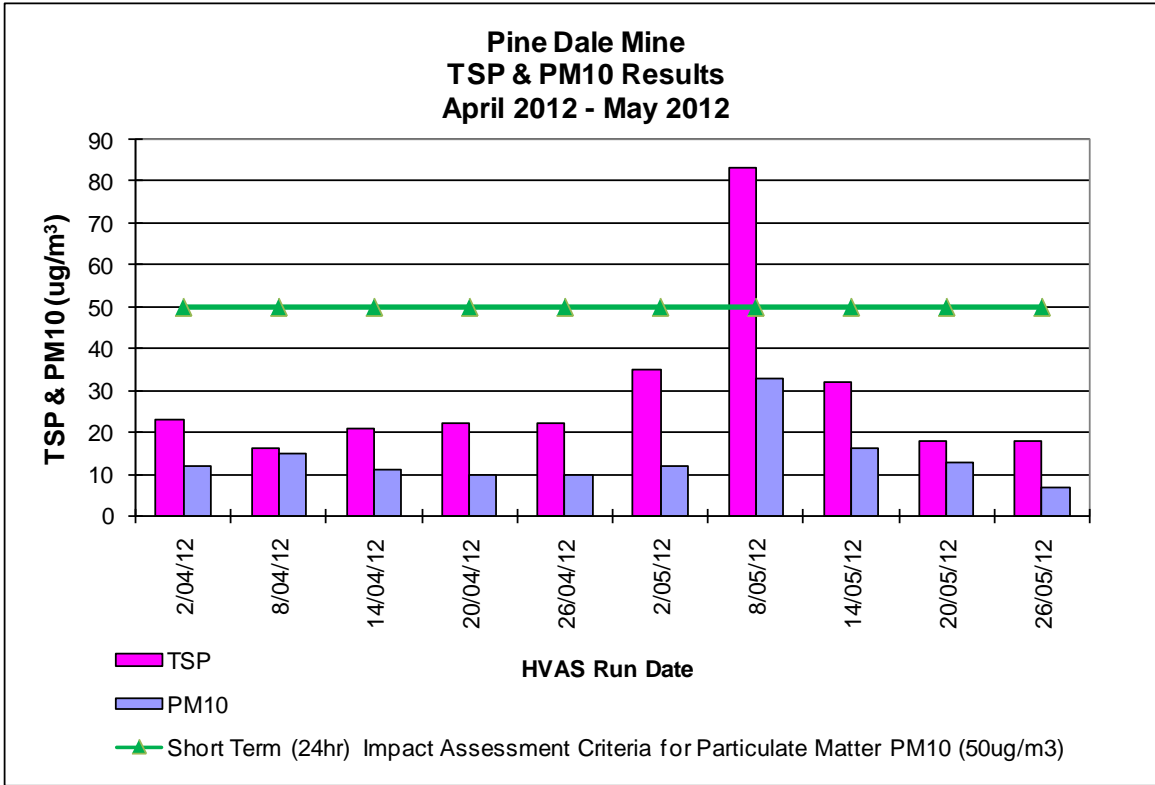
Depositional Dust and HVAS Result Graphs

**Pine Dale Mine  
Depositional Dust Gauge Comparative Results  
April 2012 - May 2012**



**Pine Dale Mine  
Deposited Matter - Insoluble Solids 12 Months Comparative Results  
June 2011 - May 2012**





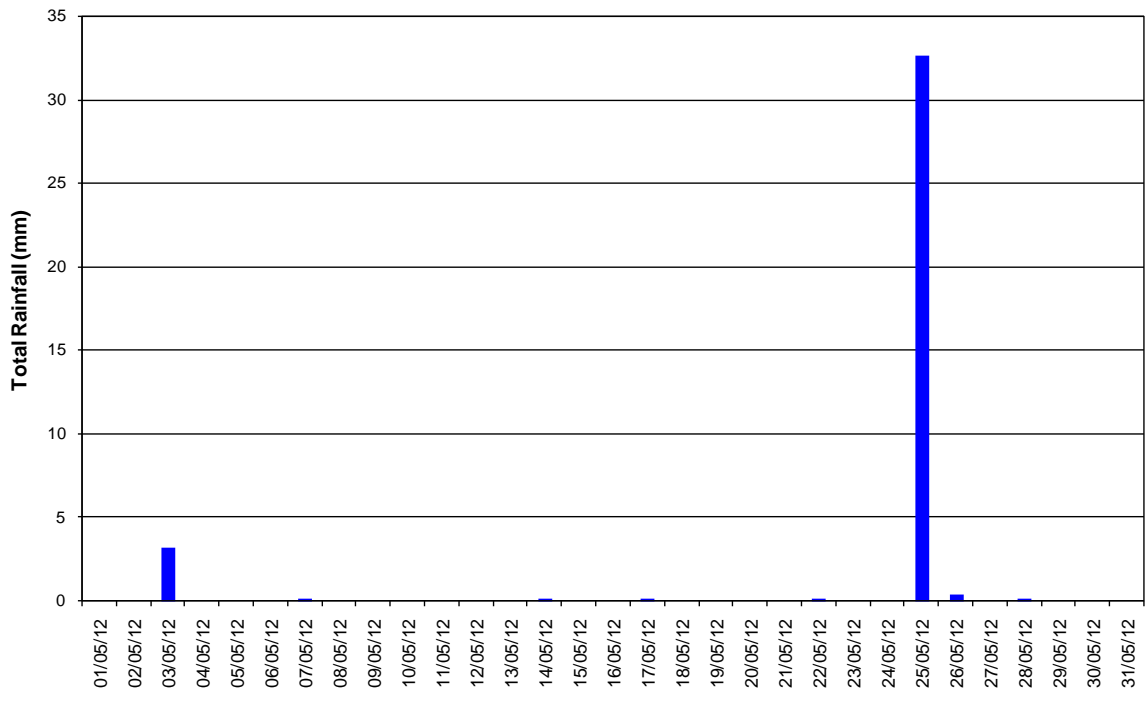
# Appendix 3

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Meteorological Data



**Blackmans Flat NSW**  
**Total Rainfall - Period: 1/05/12 to 31/05/12**



**Total Rainfall for May 2012: 37.2 mm**

**Blackmans Flat NSW**  
**Average Air Temperature - Period: 1/5/12 to 31/5/12**

