



Geotechnical Engineering

Engineering Geology

Hydrogeology

Contaminated Site Assessment

Construction Materials Testing

Environmental Monitoring

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 6880-791/0

March 2012

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				Name	Signature	Date
/0	Final	K Shaw	G Mason	K. Tripp		2.05.12

DOCUMENT DISTRIBUTION				
Rev No	Copies	Format	Issued to	Date
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RCA LE ref 6880-791/0



01 May 2012

Enhance Place Pty Ltd
Pine Dale Mine
PO Box 6095
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WOLLONGONG NSW 2521

Attention: Mr Hilton Goldfinch

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

1 GENERAL COMMENTS

Job Number: 6880.

Client Order Number: Verbal B Grant.

Date Samples Received: During the month of March 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	$\mu\text{g}/\text{m}^3$	RCA Laboratories - Environmental	NATA
Determination of Particulate Matter –	ENV-LAB004	$\text{g}/\text{m}^2/\text{month}$	RCA Laboratories - Environmental	NATA
pH	ENV-LAB006	pH	RCA Laboratories - Environmental	NATA Analysis
Conductivity	ENV-LAB010	$\mu\text{S}/\text{cm}$	RCA Laboratories - Environmental	NATA Analysis

3 WATER ANALYSIS RESULTS

3.1 GROUNDWATER

A total of five groundwater samples were collected during the month of March 2012. No sample was collected from groundwater monitoring location P4 as the bore was dry at the time of sampling.

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

Table 2 *Groundwater Analysis Results*

ANALYSIS	UNITS	P2	P3	P6	P7	P7a
Sample Number		03126880021	03126880022	01126880011	01126880024	01126880025
Date Sampled	-	02/04/12	02/04/12	02/04/12	02/04/12	02/04/12
Time Sampled	-	16:15	15:45	14:20	14:50	14:59
Standing Water Level	m	5.10	5.30	27.49	7.54	5.92
Standpipe Height	m	0.95	0.66	0.95	1.00	0.90
Relative Standing Water Level*	m	4.15	4.64	26.54	6.54	5.02
pH	pH unit	4.6	4.7	6.6	6.5	6.6
Conductivity	µS/cm	1523	243	672	672	777

NOTES:

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

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

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 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 NO	FILTER NO	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
3-Mar-12	4	02126880058	8565885	7-Mar-12	9:40	Client	24.00
9-Mar-12	13	03126880048	8565887	12-Mar-12	11:30	Client	24.00
15-Mar-12	37	03126880050	8565889	19-Mar-12	13:10	Client	24.00
21-Mar-12	29	03126880052	8565891	23-Mar-12	10:05	Client	24.00
27-Mar-12	21	03126880054	8565802	29-Mar-12	13:05	Client	24.00

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 NO	FILTER NO	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
3-Mar-12	2	02126880059	8565886	7-Mar-12	9:40	Client	24.00
9-Mar-12	5	03126880049	8565888	12-Mar-12	11:30	Client	24.00
15-Mar-12	18	03126880051	8565890	19-Mar-12	13:10	Client	24.00
21-Mar-12	11	03126880053	8565892	23-Mar-12	10:05	Client	24.00
27-Mar-12	11	03126880055	8565893	29-Mar-12	13:05	Client	24.00

4.1.1 Allowable TSP Limits

The EPA Annual Mean TSP limit is $90\mu\text{g}/\text{m}^3$. All TSP HVAS results during this monitoring period are in compliance with consent conditions, as the *current annual mean* (from April 2011 to March 2012) for the TSP unit is $20.3\mu\text{g}/\text{m}^3$, 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 Limit is $50\mu\text{g}/\text{m}^3$. The EPA Annual Mean PM10 limit is $30\mu\text{g}/\text{m}^3$. All PM₁₀ HVAS results during this monitoring period are in compliance with consent conditions, as the *current annual mean* for the PM₁₀ unit is $10.4\mu\text{g}/\text{m}^3$, which is below the allowable limit of $30\mu\text{g}/\text{m}^3$ and the 24 hour maximum was not exceeded on any run this month.

4.1.3 Comments

High Volume Air Sampler calibrations were performed on the 03/04/2012.

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 5**.

Table 5 *Deposited Matter (g/m²/month)*

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)
03126880035	6880-D1	6/03/2012	3/04/2012	28	I	0.7	0.4	0.3
03126880036	6880-D2	6/03/2012	3/04/2012	28	I	0.5	0.2	0.3
03126880037	6880-D3	6/03/2012	3/04/2012	28	I	1.2	0.7	0.5
03126880038	6880-D4	6/03/2012	3/04/2012	28	I	0.4	<0.1	0.4
03126880039	6880-D5	6/03/2012	3/04/2012	28	I	0.3	<0.1	0.3
03126880040	6880-D6	6/03/2012	3/04/2012	28	I	0.5	0.2	0.3

4.2.1 Glossary of Terms Used in Notes

FB Invalid sample: Broken Funnel

I Insects (e.g. Ants, spiders)

IT Insects (e.g. Ants, spiders) & Tree litter

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 all are all less than 0.9g/m² per month, which is below the required 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**.

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Please contact the undersigned if you have any queries.

Yours sincerely



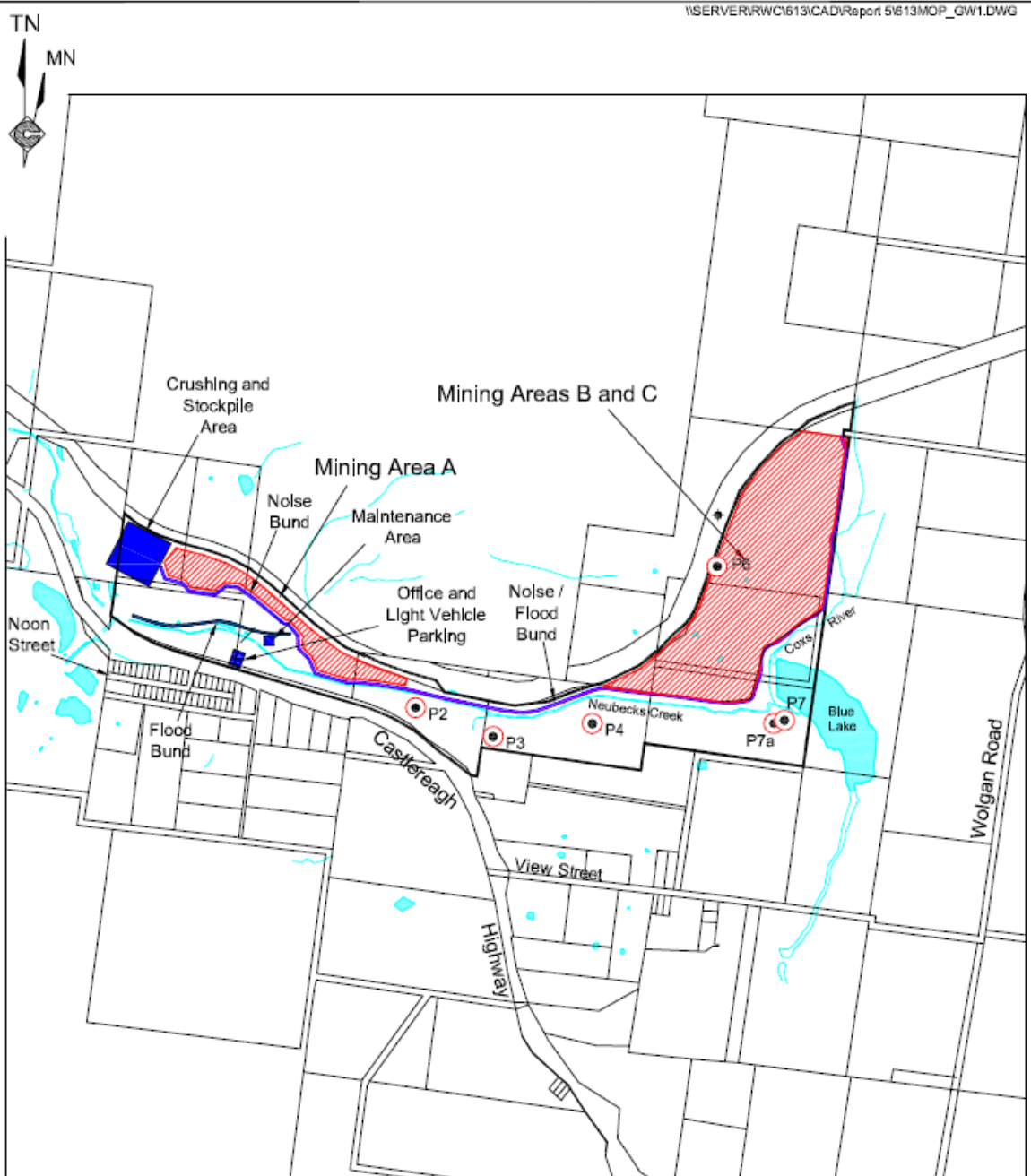
Katy Shaw
Environmental Scientist
RCA Australia Pty Ltd trading as
RCA Laboratories – Environmental



Geoff Mason
Environmental Services Manager
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

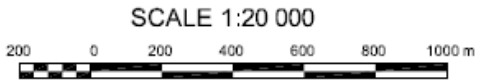
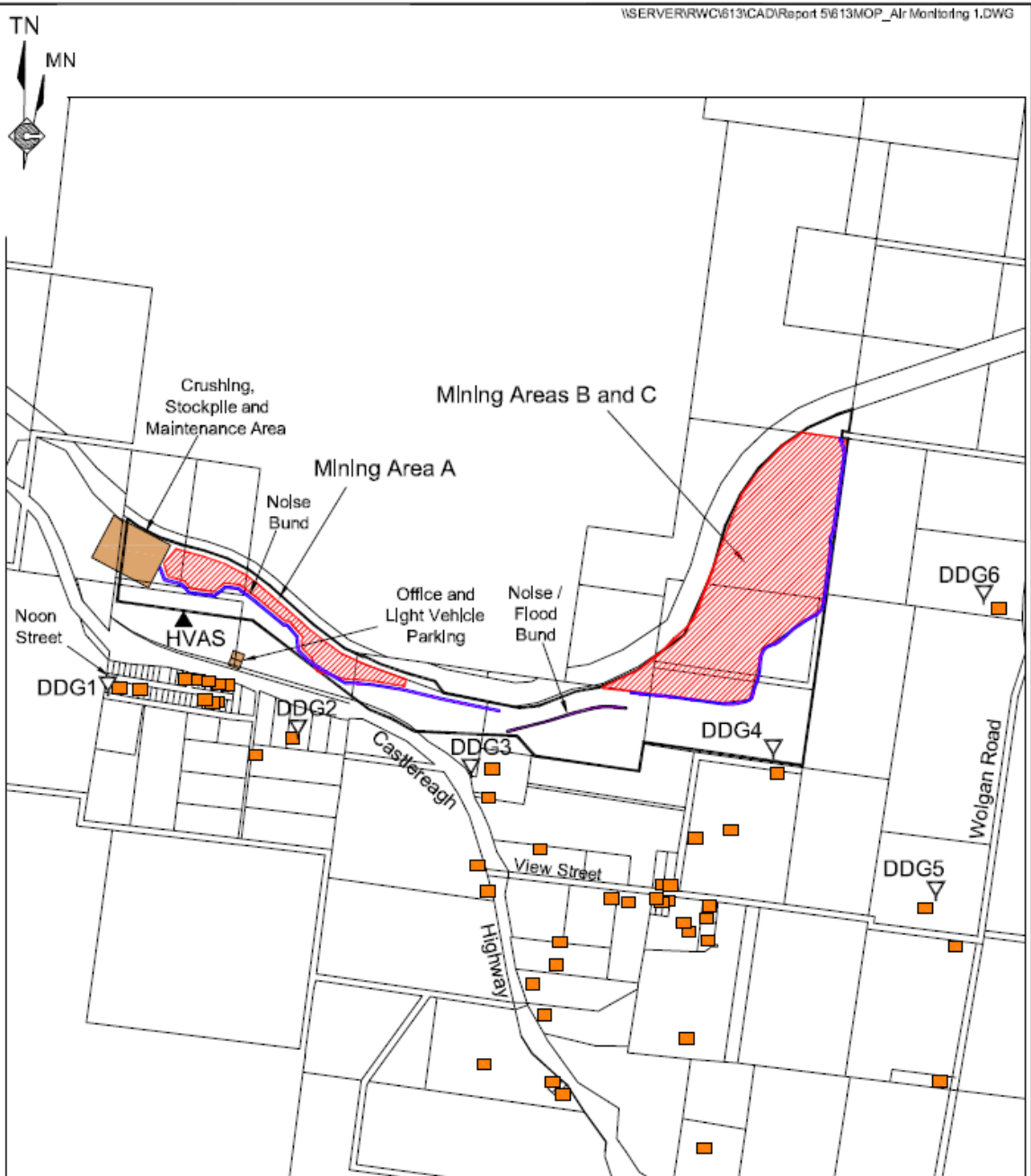


Figure GW1
 GROUNDWATER MONITORING LOCATIONS



- 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

200 0 200 400 600 800 1000 m



Figure AQ1
AIR QUALITY MONITORING LOCATIONS



Appendix 2

Depositional Dust and HVAS Result Graphs

