GROUND WATER DEPOSITIONAL DUST HVAS AND METEOROLOGICAL MONITORING

PINE DALE MINE

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

- Geotechnical Engineering
- Engineering Geology
- Hydrogeology
- Contaminated Site Assessment
- Construction Materials Testing
- Environmental Monitoring

Prepared for
PINE DALE MINE COMMUNITY CONSULTATIVE COMMITTEE

Prepared by
RCA AUSTRALIA

RCA-LE ref 6880-789/0

February 2012

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RCA LE ref 6880-789/0

5 April 2012

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Attention: Mr Hilton Goldfinch

REPORT COMPILED FOR

PINE DALE MINE COMMUNITY CONSULTATIVE COMMITTEE

DETAILING

GROUND WATER, DEPOSITIONAL DUST
HVAS AND METEOROLOGICAL MONITORING

FEBRUARY 2012

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1 GENERAL COMMENTS

Job Number: 6880.

Date Samples Received: During the month of February 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	$\mu g/m^3$	RCA Laboratories - Environmental	NATA Analysis
Determination of Particulate 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

3 WATER ANALYSIS RESULTS

3.1 GROUNDWATER

A total of 5 groundwater samples were collected during the month of February 2012. No sample was collected from groundwater monitoring location P4 as the bore contained insufficient 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		02126880021	02126880022	0212688011	02126880024	02126880025
Date Sampled	-	06/03/12	06/03/12	06/03/12	06/03/12	06/03/12
Relative Standing Water Level*	m	2.20	2.26	27.35	6.33	4.90
Temperature	°C	17.0	16.0	16.0	16.0	15.0
pH	pH unit	5.1	5.2	6.9	6.6	6.6
Conductivity	µS/cm	121	212	643	649	741

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 4**; PM10 Suspended Particulate Matter results are shown in **Table 5**.

Table 4 *Total Suspended Particulates (µg/m³ 0°C 101.3 kPa)*

RUN DATE	TSP (µg/m^3)	SAMPLE NO	FILTER NO	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
02-Feb-12	11	01126880056	8524830	06-Feb-12	9:05	Client	24.00
08-Feb-12	38	02126880050	8524831	10-Feb-12	13:10	Client	24.29
14-Feb-12	31	02126880052	8524833	17-Feb-12	7:50	Client	24.00
20-Feb-12	28	02126880054	8524835	23-Feb-12	11:50	Client	24.00
26-Feb-12	33	02126880056	8524837	28-Feb-12	8:30	Client	24.00

Table 5 *Suspended Particulate Matter PM10 (µg/m^3 0^{o}C 101.3 kPa)*

RUN DATE	PM10 (µg/m^3)	SAMPLE NO	FILTER NO	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
02-Feb-12	3	01126880057	8524829	06-Feb-12	9:05	Client	24.00
08-Feb-12	8	02126880051	8524832	10-Feb-12	13:10	Client	24.17
14-Feb-12	17	02126880053	8524834	17-Feb-12	7:50	Client	24.00
20-Feb-12	18	02126880055	8524836	23-Feb-12	11:50	Client	24.00
26-Feb-12	6	02126880057	8565884	28-Feb-12	8:30	Client	24.00

4.1.1 Allowable TSP Limits

The EPA Annual Mean TSP limit is 90µg/m^3. All TSP HVAS results during this monitoring period are in compliance with consent conditions, as the *current annual mean* (from March 2011 to February 2012) for the TSP unit is 20.0µg/m^3, which is well below the required limit of 90µg/m^3.

4.1.2 Allowable PM10 Limits

The EPA 24h Maximum PM10 Limit is 50µg/m^3. The EPA Annual Mean PM10 limit is 30µg/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 10.2µg/m^3, which is below the required limit of 30µg/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 6**.

Table 6 *Deposited Matter (g/m^2/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)
02126880037	6880-D1	7/02/2012	6/03/2012	28	I	0.9	0.4	0.5
02126880038	6880-D2	7/02/2012	6/03/2012	28	N	0.2	<0.1	0.2
02126880039	6880-D3	7/02/2012	6/03/2012	28	I	0.7	0.4	0.3
02126880040	6880-D4	7/02/2012	6/03/2012	28	I	0.3	<0.1	0.3
02126880041	6880-D5	7/02/2012	6/03/2012	28	RN	-	-	-
02126880042	6880-D6	7/02/2012	6/03/2012	28	I	1.4	0.5	0.9

4.2.1 Glossary of Terms Used in Notes

I Insects
N No foreign matter
RN Crucible broken during analysis; no result for this sample

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 all are all less than 0.9 g/m^2 per month, which is below the required 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**.

Please contact the undersigned if you have any queries.

Yours sincerely,

Karen Tripp
Senior Environmental Scientist / Hygienist
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

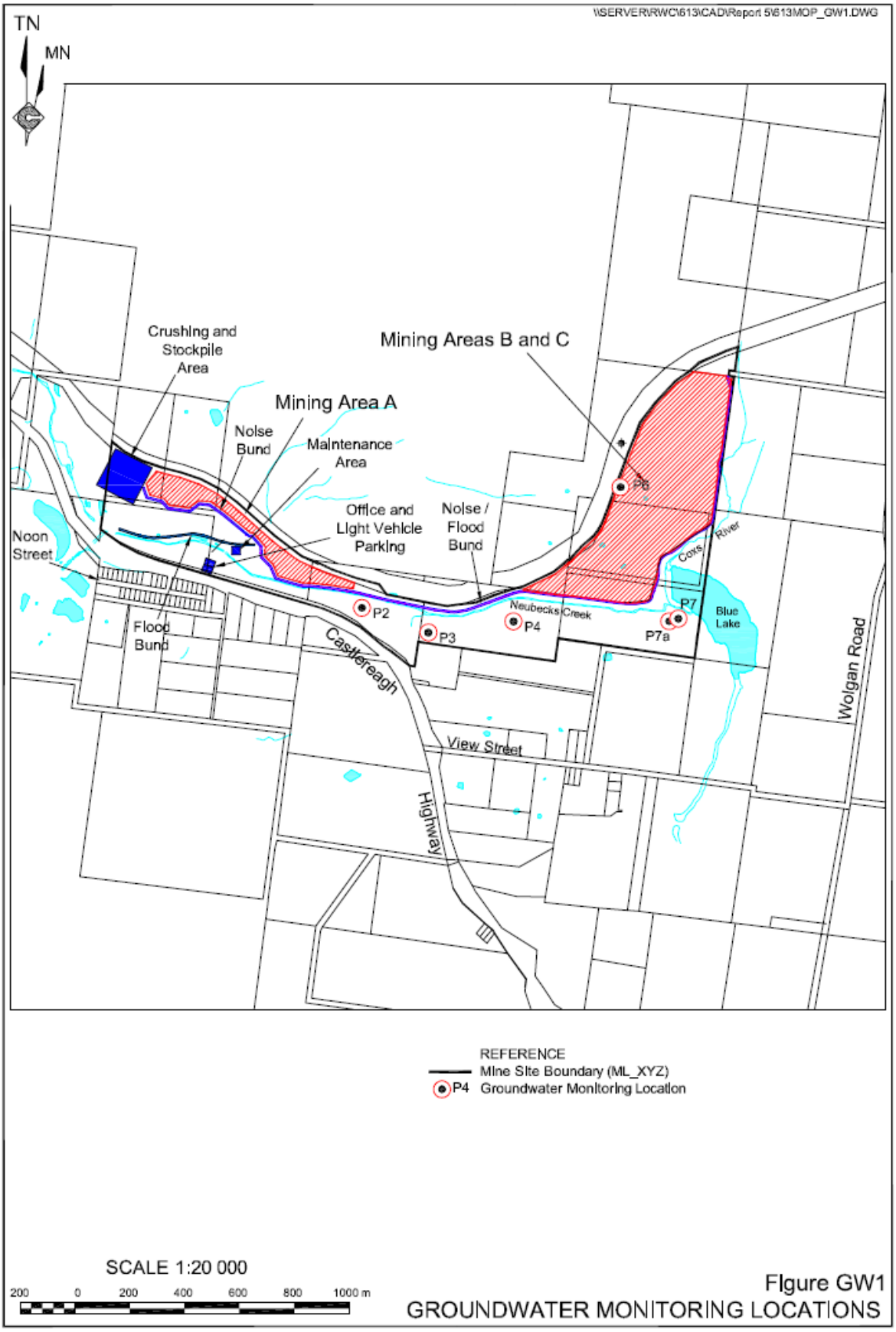

Figure GW1
GROUNDWATER MONITORING LOCATIONS

R.W. CORKERY & CO. PTY. LIMITED

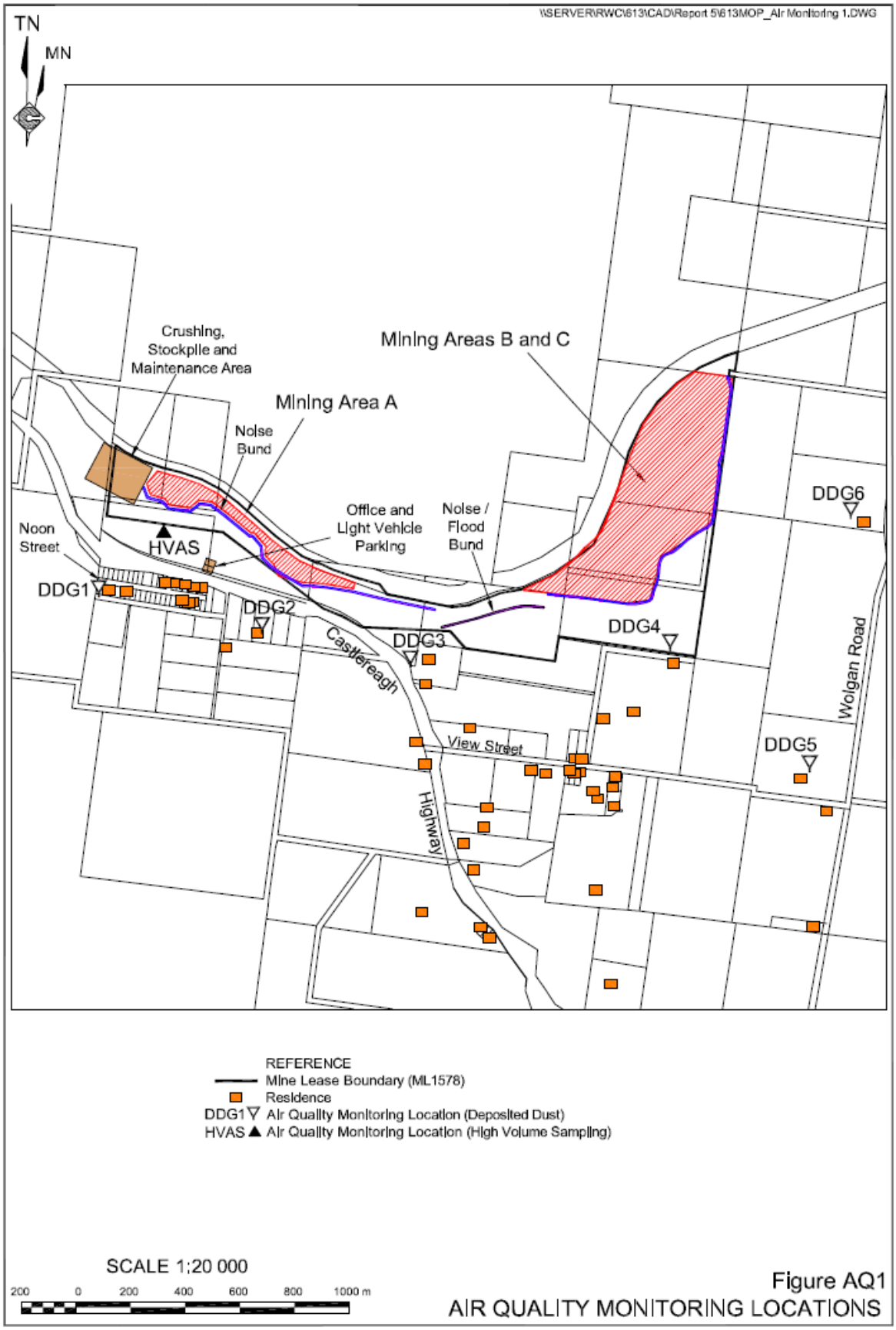

Figure AQ1
AIR QUALITY MONITORING LOCATIONS

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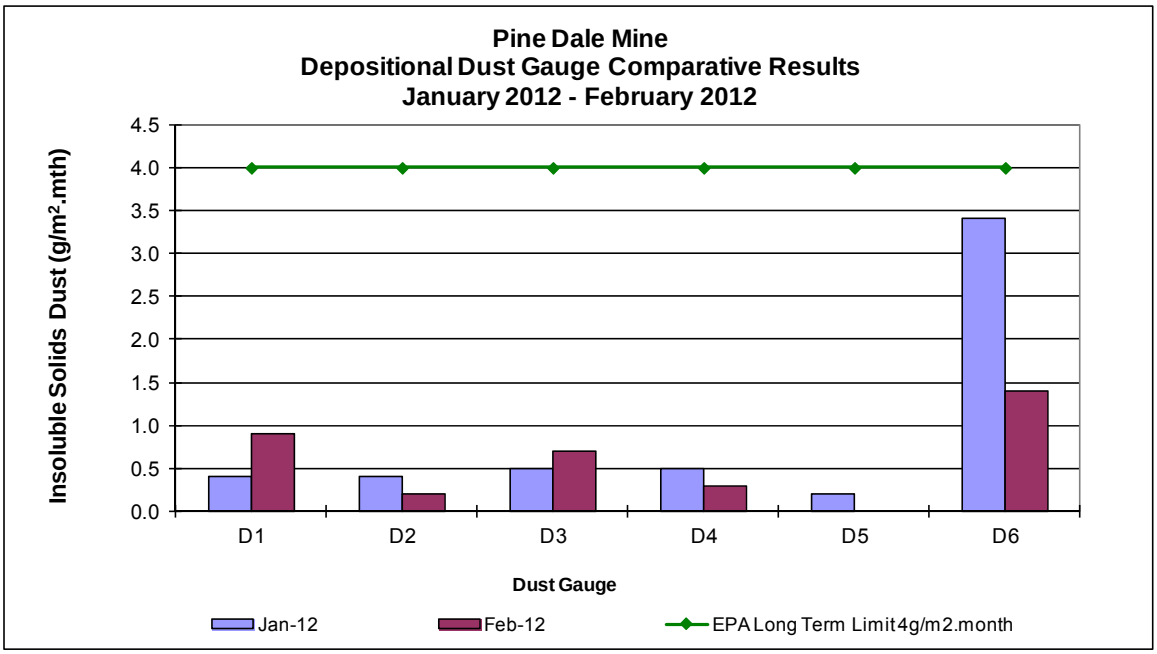
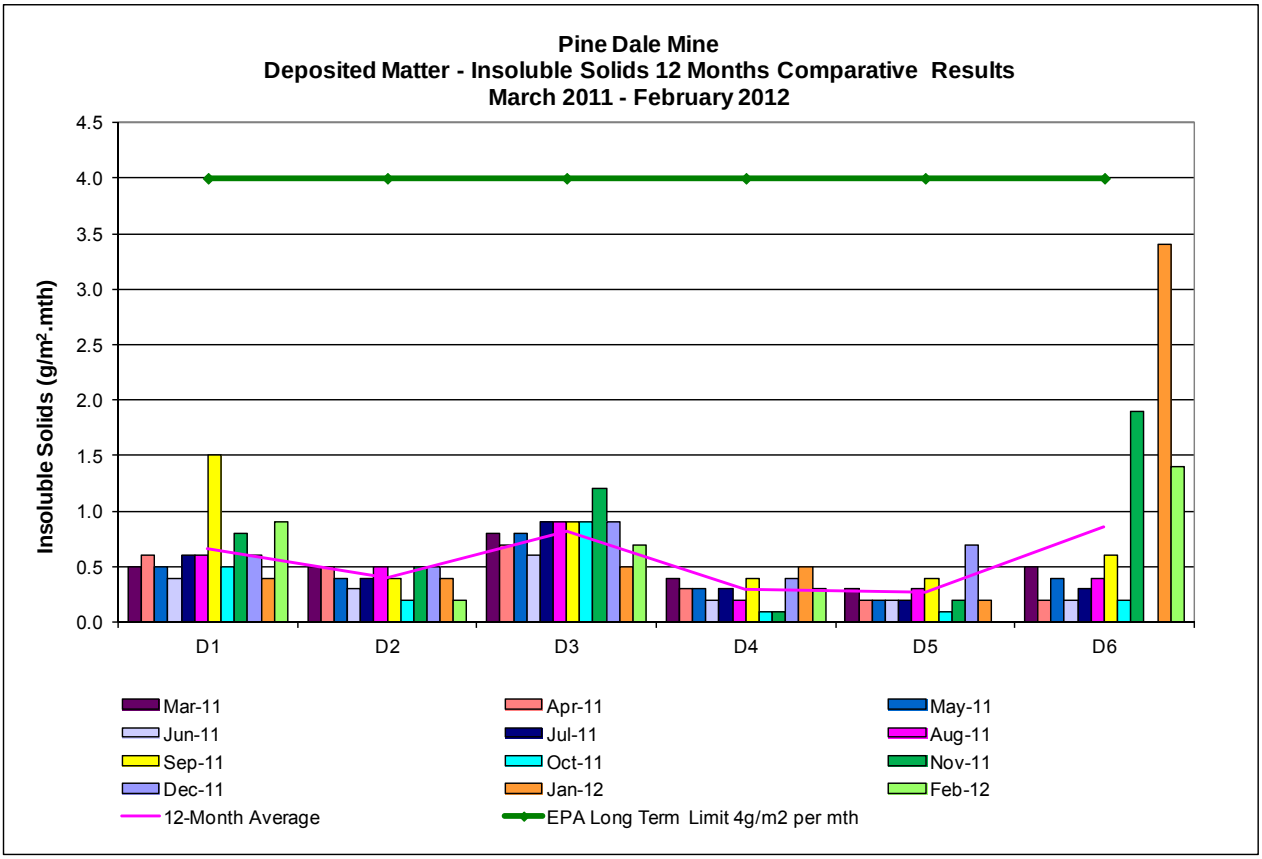
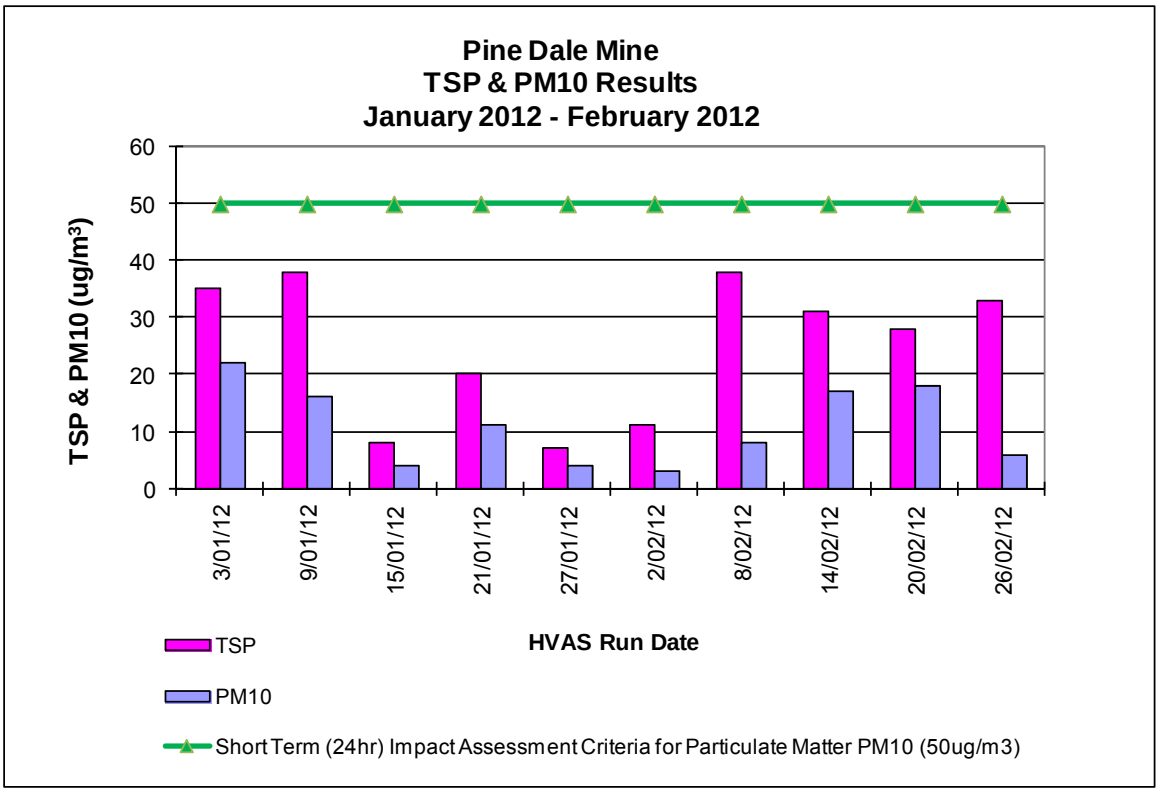
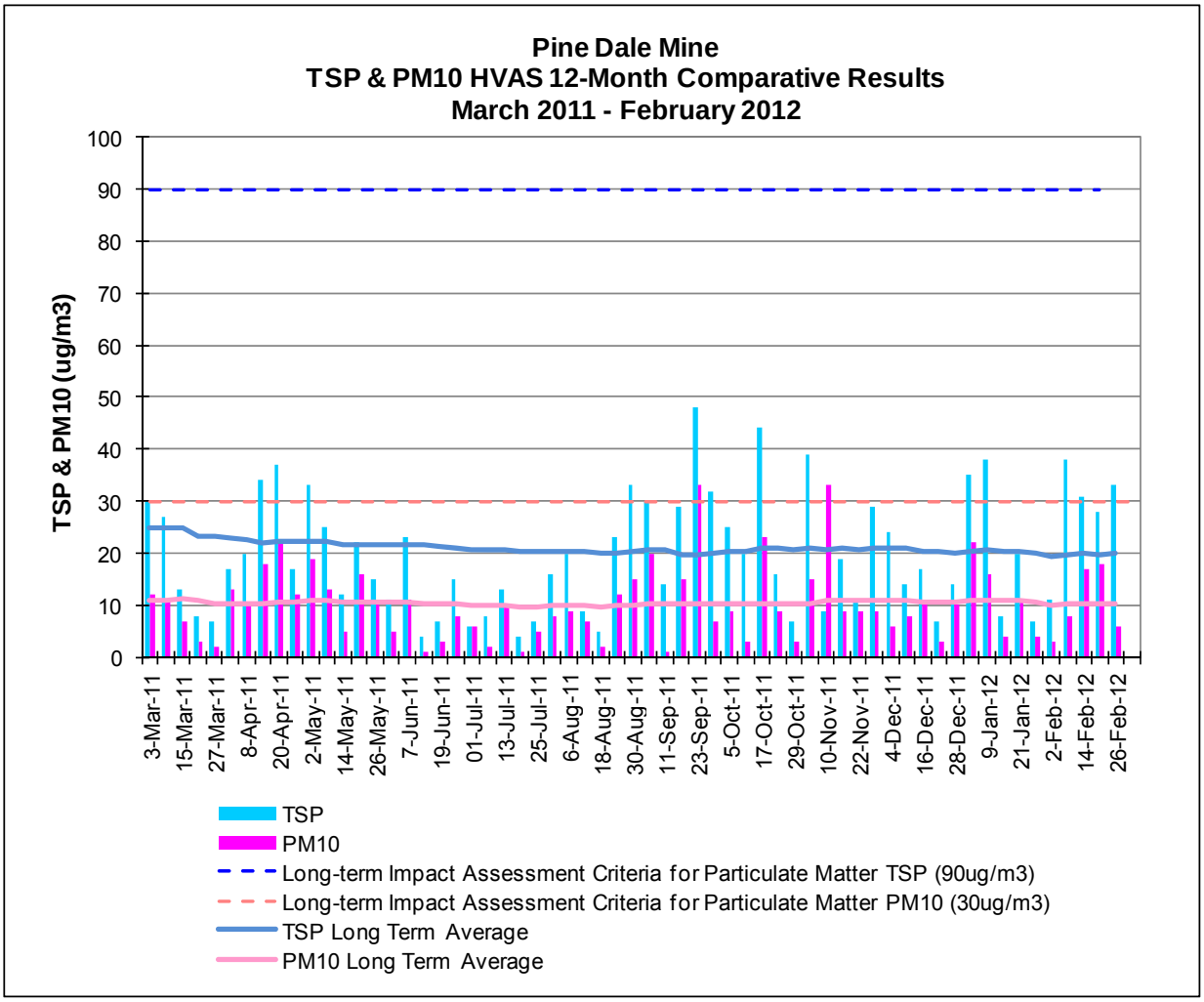
Appendix 2

Depositional Dust and HVAS Result Graphs


Pine Dale Mine
Depositional Dust Gauge Comparative Results
January 2012 - February 2012
Insoluble Solids Dust (g/m².mth)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
D1
D2
D3
D4
D5
D6
Dust Gauge
Jan-12
Feb-12
EPA Long Term Limit4g/m2.month


Pine Dale Mine
Deposited Matter - Insoluble Solids 12 Months Comparative Results
March 2011 - February 2012
Insoluble Solids (g/m².mth)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
D1
D2
D3
D4
D5
D6
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Jan-12
Feb-12
12-Month Average
EPA Long Term Limit 4g/m2 per mth


Pine Dale Mine
TSP & PM10 Results
January 2012 - February 2012
TSP & PM10 (ug/m³)
60
50
40
30
20
10
0
3/01/12
9/01/12
15/01/12
21/01/12
27/01/12
2/02/12
8/02/12
14/02/12
20/02/12
26/02/12
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
March 2011 - February 2012
TSP & PM10 (ug/m3)
100
90
80
70
60
50
40
30
20
10
0
3-Mar-11
15-Mar-11
27-Mar-11
8-Apr-11
20-Apr-11
2-May-11
14-May-11
26-May-11
7-Jun-11
19-Jun-11
01-Jul-11
13-Jul-11
25-Jul-11
6-Aug-11
18-Aug-11
30-Aug-11
11-Sep-11
23-Sep-11
5-Oct-11
17-Oct-11
29-Oct-11
10-Nov-11
22-Nov-11
4-Dec-11
16-Dec-11
28-Dec-11
9-Jan-12
21-Jan-12
2-Feb-12
14-Feb-12
26-Feb-12
TSP
PM10
Long-term Impact Assessment Criteria for Particulate Matter TSP (90ug/m3)
Long-term Impact Assessment Criteria for Particulate Matter PM10 (30ug/m3)
TSP Long Term Average
PM10 Long Term Average