GROUND WATER, SURFACE WATER, DEPOSITIONAL DUST, HVAS AND METEOROLOGICAL MONITORING

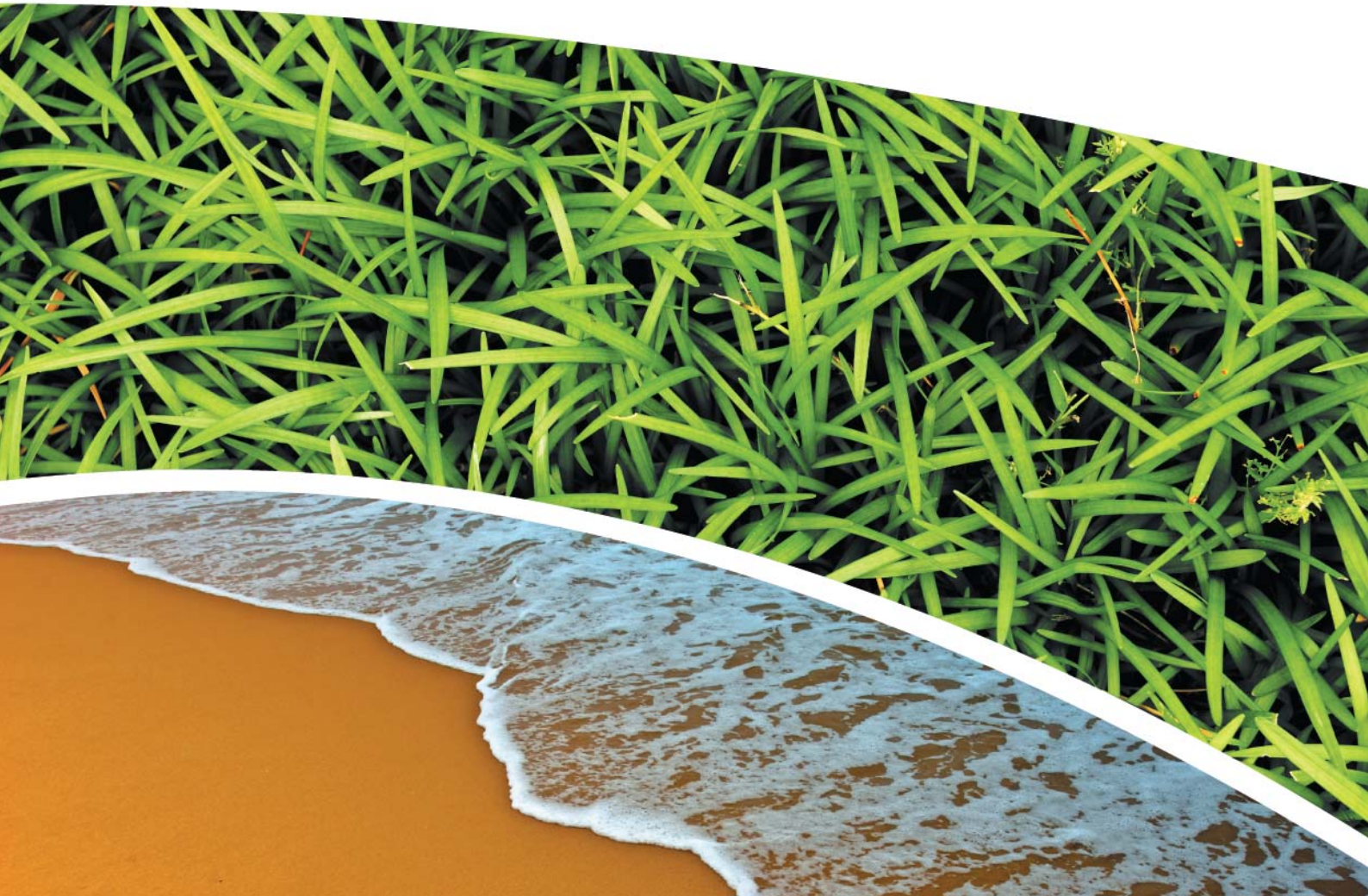
Pine Dale Mine

Prepared for
Pine Dale Mine Community Consultative Committee

RCA Australia

RCA ref 6880-803/0
August 2012

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL



RCA AUSTRALIA
ABN 53 063 515 711

92 Hill Street, CARRINGTON NSW 2294

Telephone: +61 2 4902 9200
Facsimile: +61 2 4902 9299
Email: administrator@rca.com.au
Internet: www.rca.com.au

DOCUMENT STATUS						
Rev No	Comment	Author	Reviewer	Approved for Issue (Project Manager)		
				Name	Signature	Date
/0	Final	K Shaw	K Tripp	K Tripp	KT	4.10.12

DOCUMENT DISTRIBUTION				
Rev No	Copies	Format	Issued to	Date
/0	1	Electronic (email)	Pine Dale Mine – Hilton Goldfinch hilton.a.goldfinch@bigpond.com	4.10.12
/0	1	Electronic (email)	Truenergy- Mark Frewin mark.frewin@truenergy.com.au	4.10.12
/0	1	Electronic (email)	Lithgow City Council – Skye Ellacott Skye.Ellacott@lithgow.nsw.gov.au	4.10.12
/0	1	Bound report	Pine Dale Mine – Hilton Goldfinch PO Box 202, Wallerawang NSW 2845	4.10.12
/0	1	Bound report	RCA – job archive	4.10.12
/0	1	Electronic report	RCA – job archive	4.10.12

RCA LE ref 6880-803/0

4 October 2012

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

AUGUST 2012

Robert Carr & Associates Pty Ltd
T/A RCA Australia ABN 53 063 515 711

92 Hill St, PO Box 175 Carrington NSW 2294
Ph 02 **4902 9200 Fax** 02 **4902 9299**

Email administrator@rca.com.au
Web www.rca.com.au

1 GENERAL COMMENTS

Job Number: 6880.

Date Samples Received: During the month of August 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^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
Total Suspended Solids	ENV-LAB009	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
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 August 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		08126880019	08126880020	08126880010	08126880022	08126880023
Date Sampled	-	30/08/12	30/08/12	30/08/12	30/08/12	30/08/12
Time Sampled	-	13:24	13:18	12:09	12:20	12:25
Standing Water Level	m	5.05	5.80	26.60	7.82	5.87
Standpipe Height	m	0.95	0.66	0.95	1.00	0.90
Relative Standing Water Level*	m	4.10	5.14	25.65	6.82	4.97
pH	pH unit	4.4	4.7	6.8	6.7	6.7
Conductivity	µS/cm	328	597	653	690	777
Bicarbonate Alkalinity	mg/L	<1	<1	174	205	215
Total Alkalinity	mg/L	<1	<1	174	205	215
Sulfate	mg/L	114	236	111	76	36
Chloride	mg/L	11	14	30	62	118
Calcium	mg/L	15	36	65	37	46
Magnesium	mg/L	11	26	28	43	45
Sodium	mg/L	19	26	18	39	42
Potassium	mg/L	5	7	15	8	10
Dissolved Iron	mg/L	0.52	2.13	16.4	2.21	<0.05

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 August 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	-	08126880033	08126880014	08126880034
Date Sampled	-	30/08/2012	30/08/2012	31/08/2012
Time Sampled	-	11:40	13:33	06:43
Temperature	°C	11.0	11.0	7.5
Flow	-	Slow	Moderate	Moderate
pH	pH	7.6	7.4	7.6
Conductivity	µS/cm	572	631	596
Turbidity	NTU	2	3	5
Total Suspended Solids	mg/L	<5	<5	<5
Sulfate	mg/L	200	219	8
Dissolved Iron	mg/L	<0.05	0.5	0.36

3.2.1 Allowable Surface Water Quality

Under requirements outlined in EPL 4911, specific water quality parameters are required to be monitored at EPA Points 4, 5 and 13. These sites require monitoring if under discharge conditions.

During August 2012, Pine Dale Mine was not discharging and therefore Points 4, 5 and 13 were not required to be sampled this month. EPA Points 2, 3 and 14 were sampled this month in accordance with EPL conditions although there are no specific water quality guidelines for these sites.

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_{10} 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
06-Aug-12	15	08126880049	7626657	08-Aug-12	1:30	Client	24.00
12-Aug-12	13	08126880051	8579278	15-Aug-12	10:05	Client	23.98
18-Aug-12	7	08126880053	8579280	22-Aug-12	12:55	Client	24.00
24-Aug-12	14	08126880055	8579282	28-Aug-12	1:25	Client	24.00
30-Aug-12	18	08126880057	8579284	31-Aug-12	9:35	K Hawes	23.97

Table 5 *Suspended Particulate Matter PM_{10} (µg/m^3 0^{o}C 101.3 kPa)*

RUN DATE	PM_{10} (µg/m^3)	SAMPLE NO	FILTER NO	DATE FILTER OFF	TIME FILTER OFF	FIELD TECH	HOURS RUN
06-Aug-12	6	08126880050	8579277	08-Aug-12	1:30	Client	24.00
12-Aug-12	13	08126880052	8579279	15-Aug-12	10:05	Client	24.00
18-Aug-12	4	08126880054	8579281	22-Aug-12	12:55	Client	24.00
24-Aug-12	6	08126880056	8579283	28-Aug-12	1:25	Client	24.00
30-Aug-12	9	08126880058	8579285	31-Aug-12	9:35	C South	24.01

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 September 2011 to August 2012) for the TSP unit is 22.2µg/m^3, which is well below the allowable limit of 90µg/m^3.

4.1.2 Allowable PM_{10} Limits

The EPA 24h Maximum PM_{10} Limit is 50µg/m^3. The EPA Annual Mean PM_{10} limit is 30µg/m^3. All PM_{10} HVAS results during this monitoring period are in compliance with consent conditions, as the *current annual mean* for the PM_{10} unit is 10.8µg/m^3, which is below the allowable limit of 30µg/m^3 and the 24 hour maximum was not exceeded on any run day during the month.

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)
08126880035	D1	30/07/2012	31/08/2012	32	N	0.8	0.5	0.3
08126880036	D2	30/07/2012	31/08/2012	32	I	0.8	0.4	0.4
08126880037	D3	30/07/2012	31/08/2012	32	N	1.1	0.7	0.4
08126880038	D4	30/07/2012	31/08/2012	32	IG	0.4	0.2	0.2
08126880039	D5	30/07/2012	31/08/2012	32	I	0.3	0.1	0.2
08126880040	D6	30/07/2012	31/08/2012	32	I	0.4	0.2	0.2

4.2.1 Glossary of Terms Used in Notes

N No Foreign Matter

I Insects (e.g. Ants, spiders)

IG Insects (e.g. Ants, spiders) & grass and grass seeds

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 0.9g/m^2 per month or less, 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**.

4.3 BLASTING

Table 7 *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)
3/08/2012	NT	NT	113.0	2.69	111.9	2.81
7/08/2012	NT	NT	NT	NT	101.9	0.90
15/08/2012	NT	NT	113.8	0.84	110.6	2.36
22/08/2012	NT	NT	NT	NT	113.0	1.38
2012 Year to Date Information						
Minimum	103.9	0.32	104.7	0.33	101.9	0.32
Average	109.1	2.14	111.3	1.43	111.0	1.96
Maximum	114.6	3.95	114.4	2.69	116.3	4.58
% of Blasts > EPL 95% Compliance Criteria (115dB)	0%	0%	0%	0%	4%	0%
% of Blasts > EPL 100% Compliance Criteria (120dB)	0%	0%	0%	0%	0%	0%

Notes: NT No Trigger

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. Pine Dale Mine's reporting period runs from 1 January 2012- 31 December 2012.

During August 2012, there were nil exceedances of the EPL conditions for both overpressure and vibration levels. Year- to- date, zero blasts have exceeded the 100% compliance conditions of 120dB and 10mm/sec for overpressure and vibration respectively. Overpressure and vibration criteria of 115dB and 5mm/sec, respectively, have not been exceeded for more than 5% of the blasts during the 2012 reporting period. Please note that data for the full reporting period has yet to be collected.

Graphical blasting results from overpressure and vibration are presented in **Appendix 2**.

5 SUMMARY

During the month of August 2012 all sites were found to be in compliance with EPL 4911.

Quarterly surface water sampling was conducted in August 2012. All required sites were sampled during this monitoring round. EPA Points 4, 5 and 13 were not sampled this month because the site was not discharging.

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. There were zero exceedances of the PM_{10} short term impact assessment criteria of 50µg/m^3 over twenty-four hours during August 2012.

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 August there were nil exceedances of the blasting requirements as outlined in Pine Dale Mine's EPL. During the 2012 reporting period to date there are no non-compliances based upon the 95% or 100% limits for either overpressure or vibration levels.

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

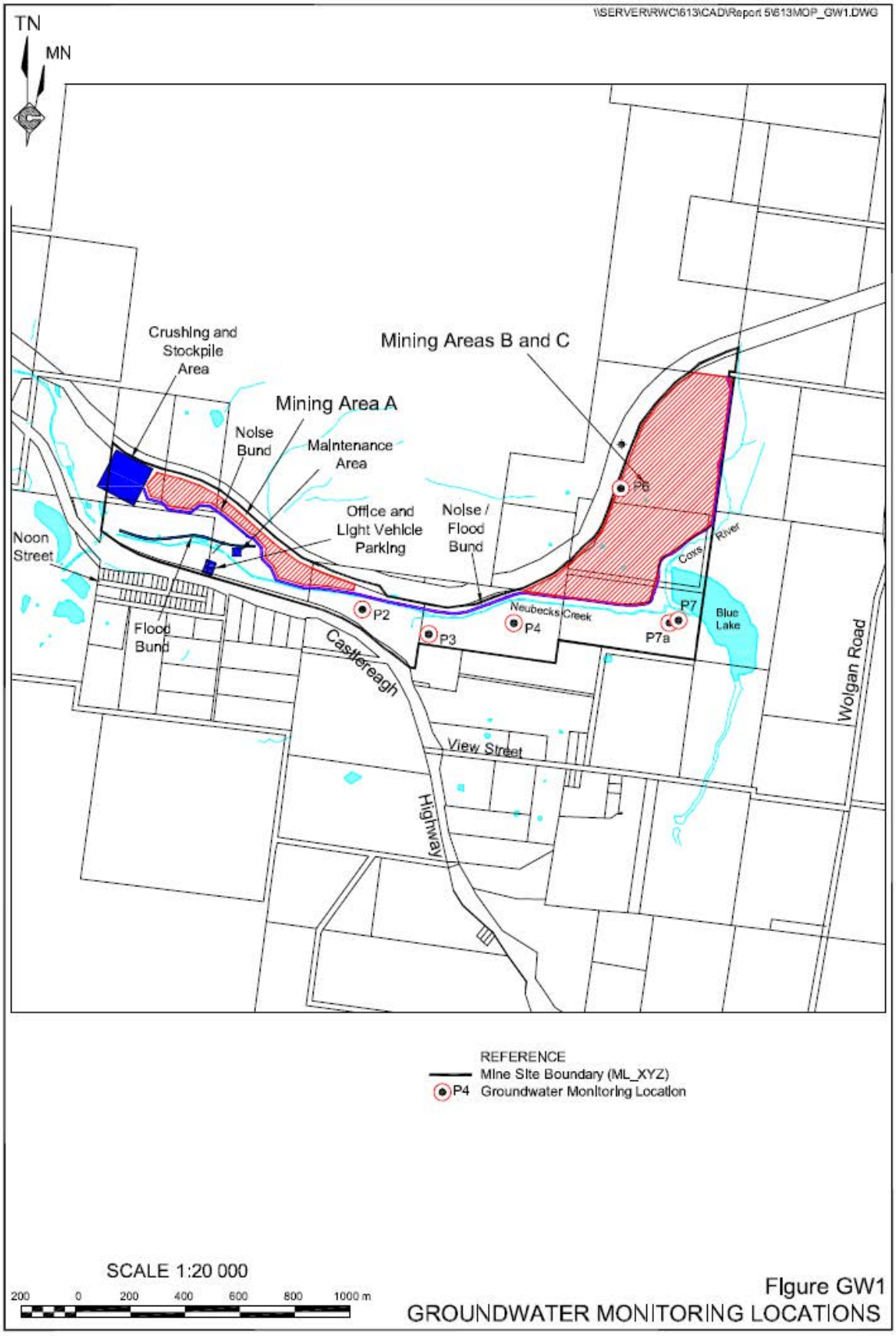


Figure GW1
GROUNDWATER MONITORING LOCATIONS

R.W. CORKERY & CO. PTY. LIMITED

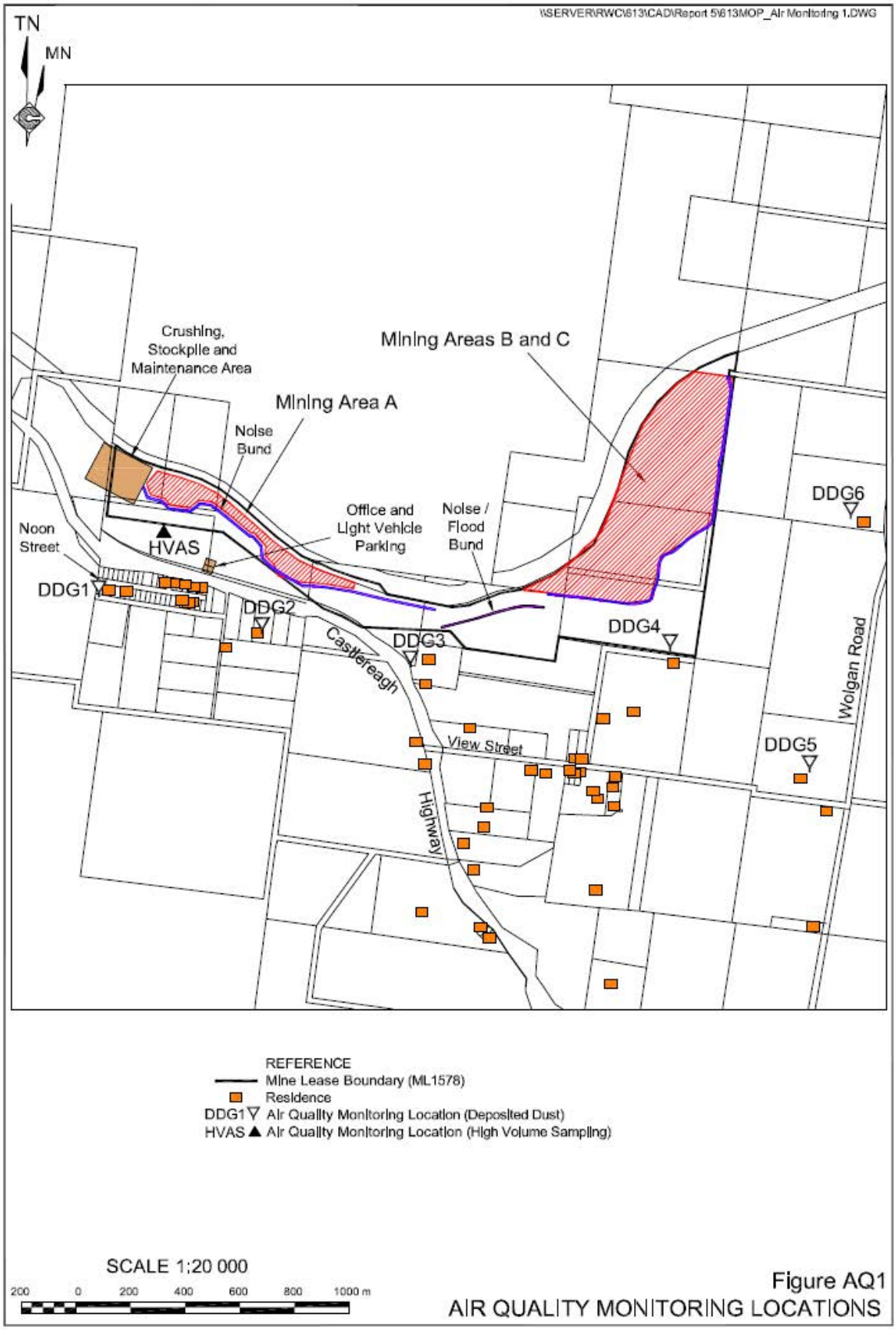
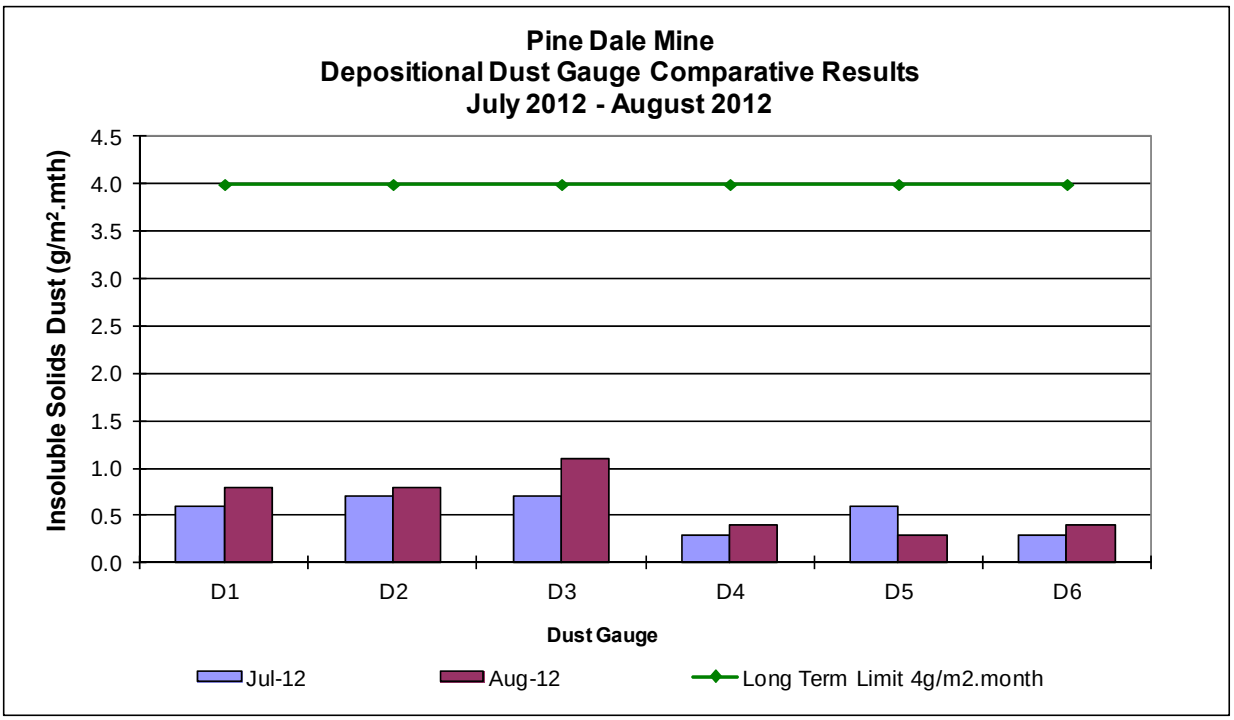


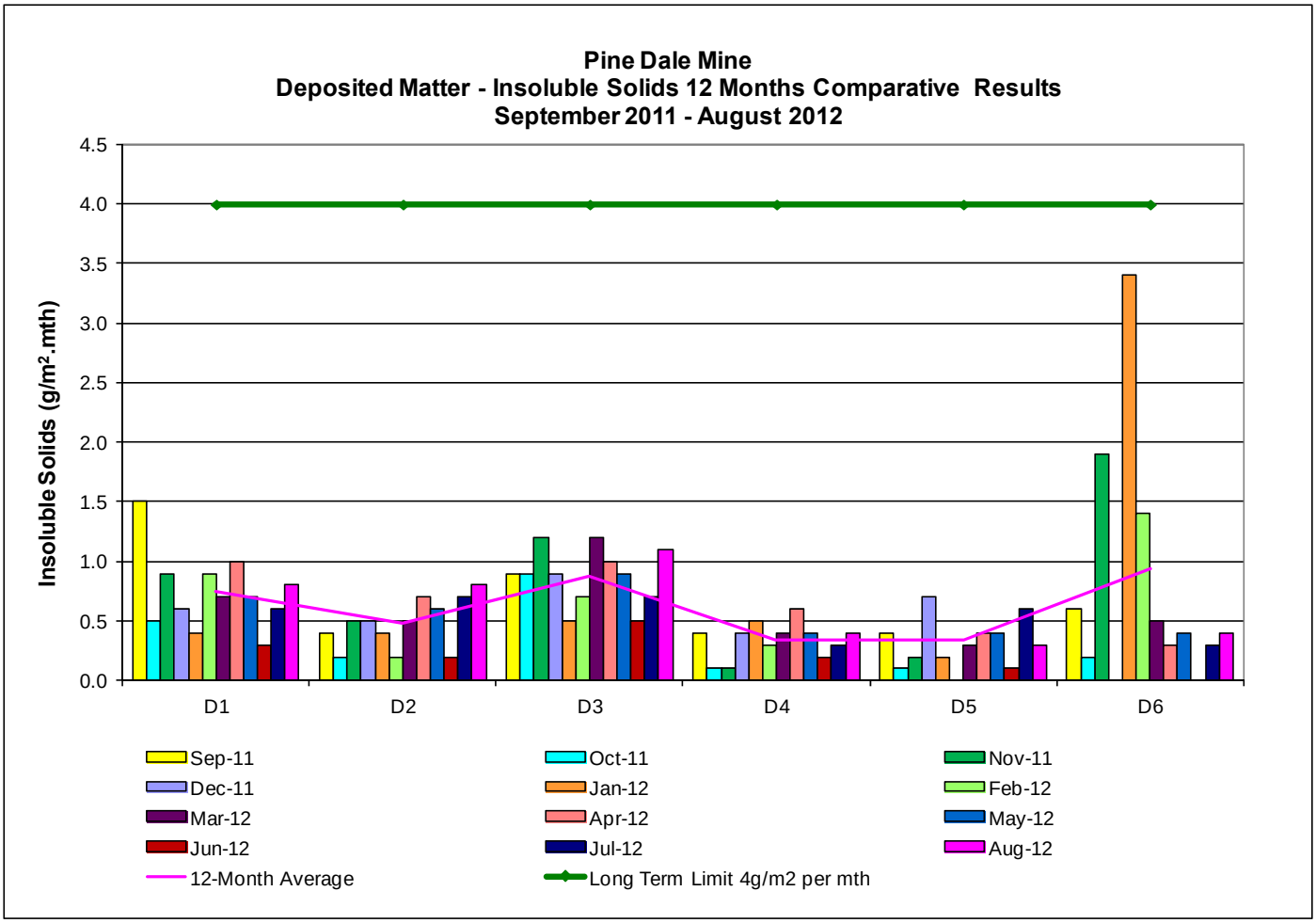
Figure AQ1
AIR QUALITY MONITORING LOCATIONS

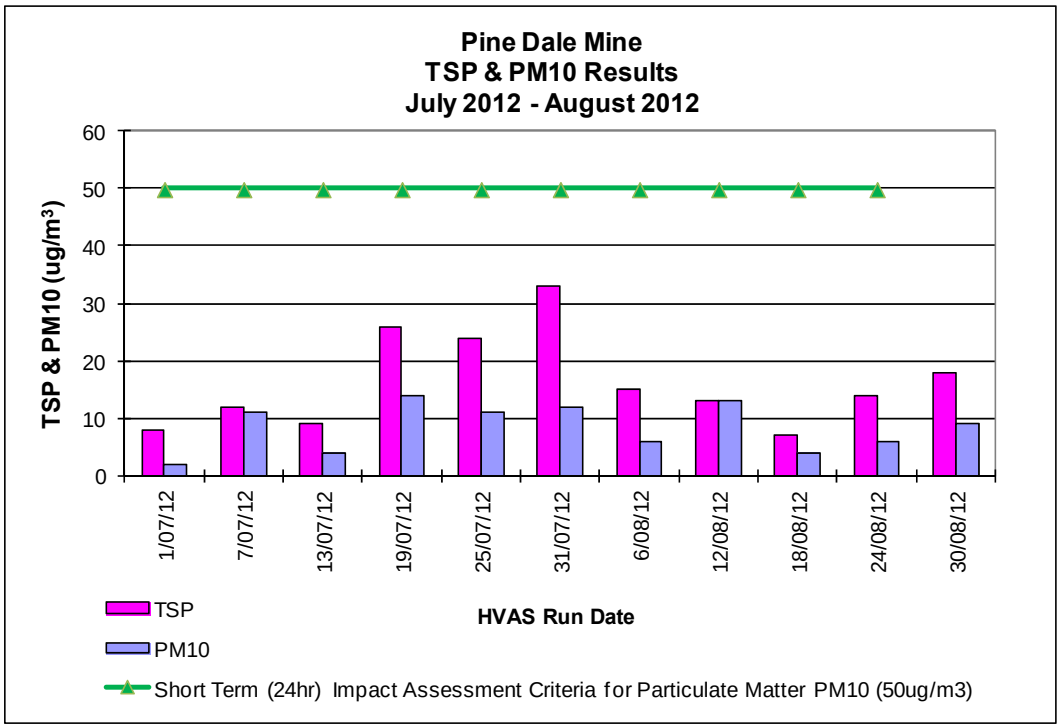
R.W. CORKERY & CO. PTY. LIMITED

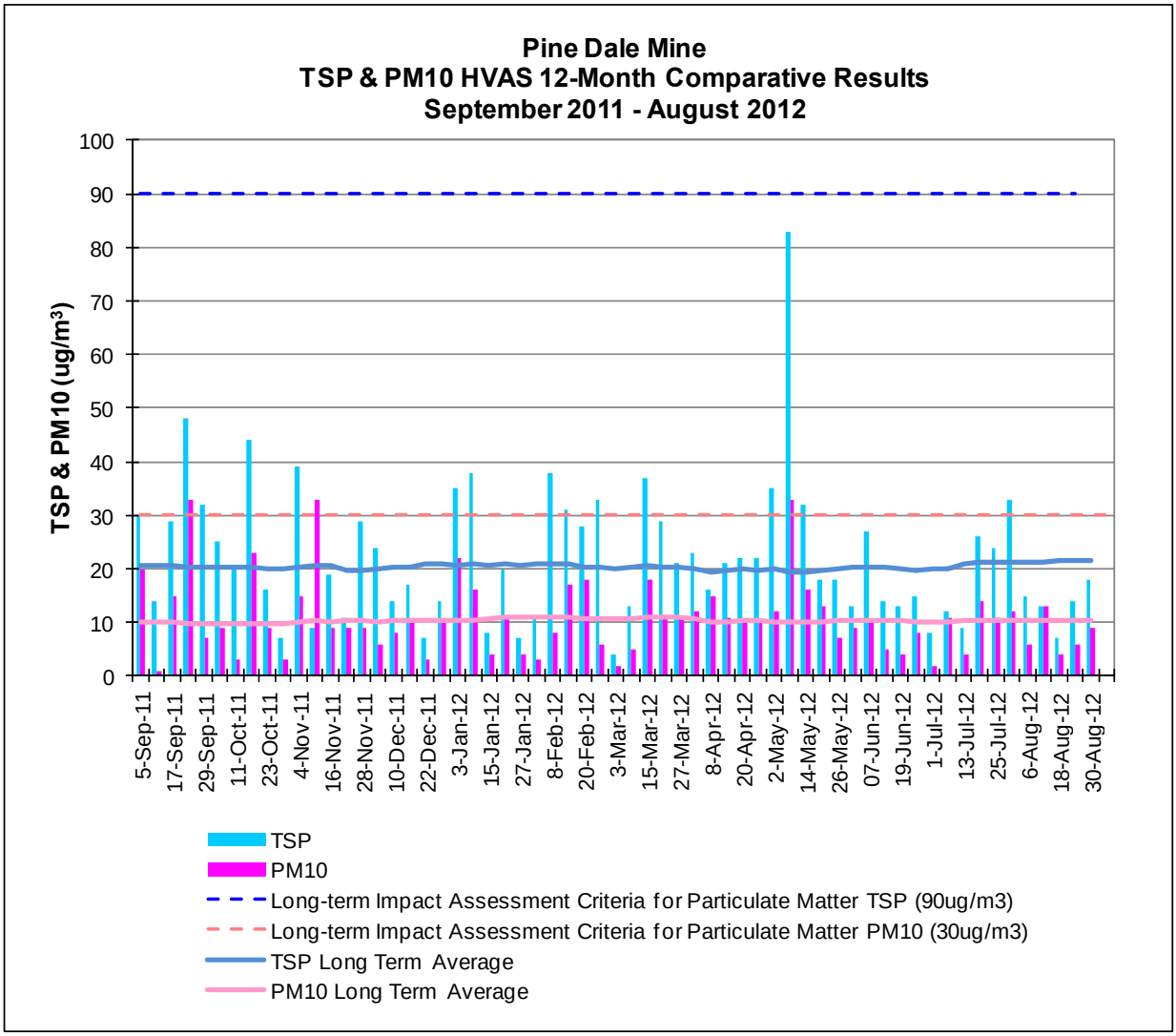
Appendix 2

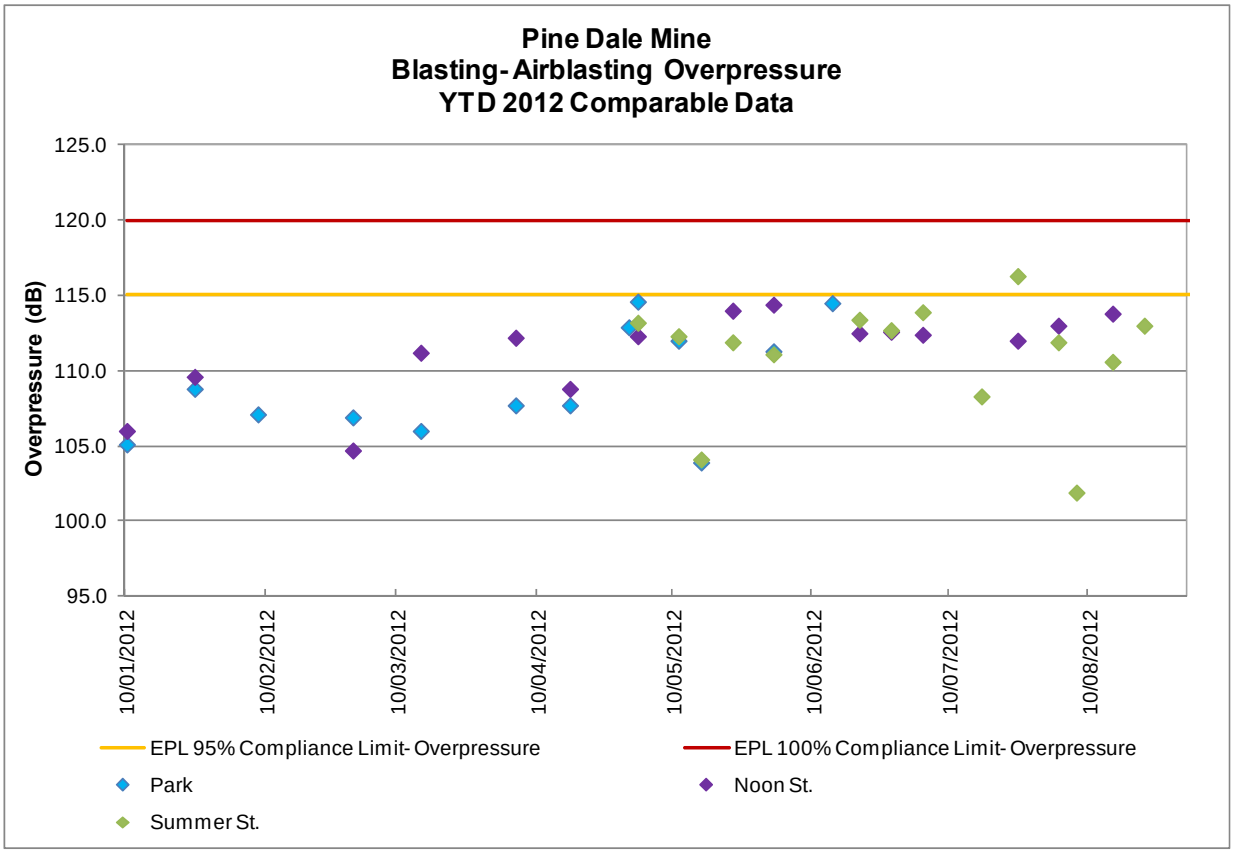
Depositional Dust, HVAS & Blast Result Graphs

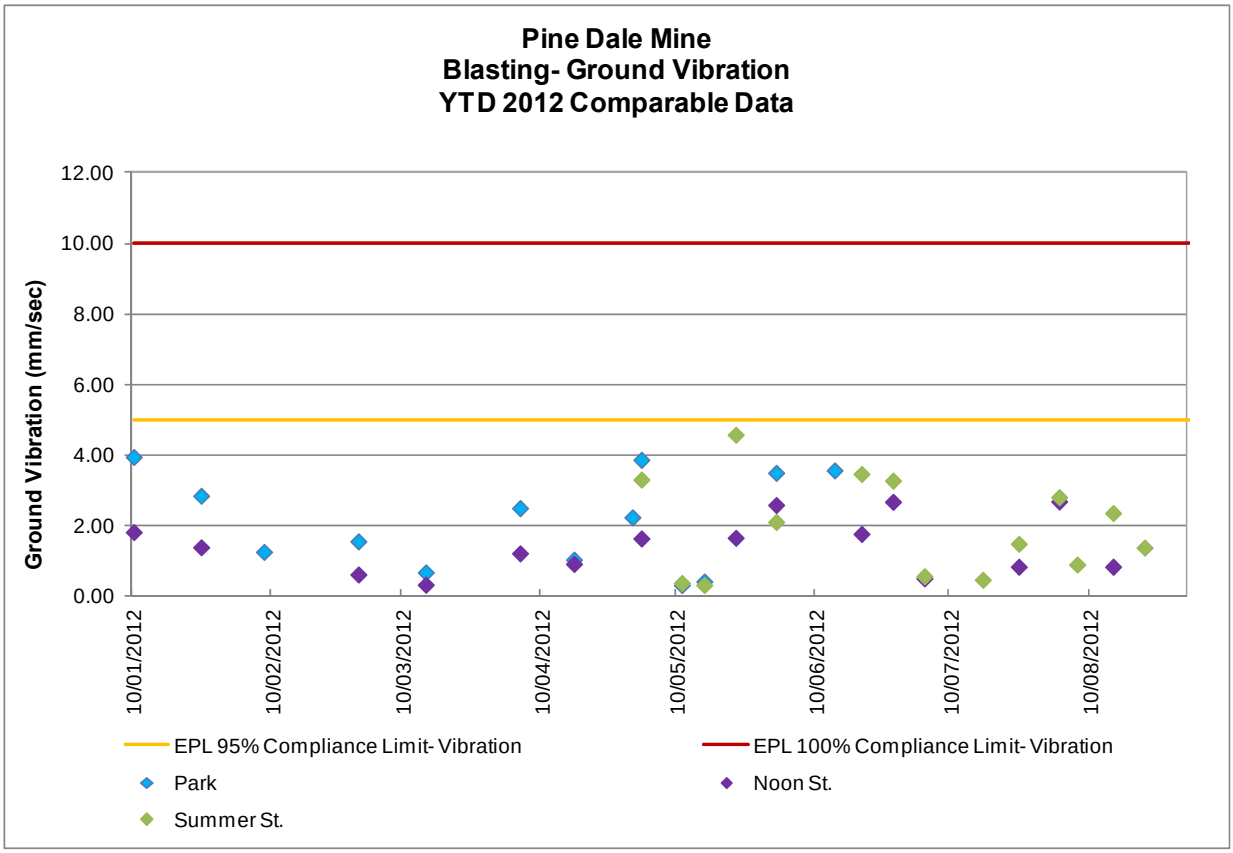

Pine Dale Mine
Depositional Dust Gauge Comparative Results
July 2012 - August 2012
Insoluble Solids Dust (g/m².mth)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
D1
D2
D3
D4
D5
D6
Dust Gauge
Jul-12
Aug-12
Long Term Limit 4g/m2.month


Pine Dale Mine
Deposited Matter - Insoluble Solids 12 Months Comparative Results
September 2011 - August 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
Sep-11
Oct-11
Nov-11
Dec-11
Jan-12
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
12-Month Average
Long Term Limit 4g/m2 per mth


Pine Dale Mine
TSP & PM10 Results
July 2012 - August 2012
TSP & PM10 (ug/m³)
60
50
40
30
20
10
0
1/07/12
7/07/12
13/07/12
19/07/12
25/07/12
31/07/12
6/08/12
12/08/12
18/08/12
24/08/12
30/08/12
HVAS Run Date
TSP
PM10
Short Term (24hr) Impact Assessment Criteria for Particulate Matter PM10 (50ug/m3)

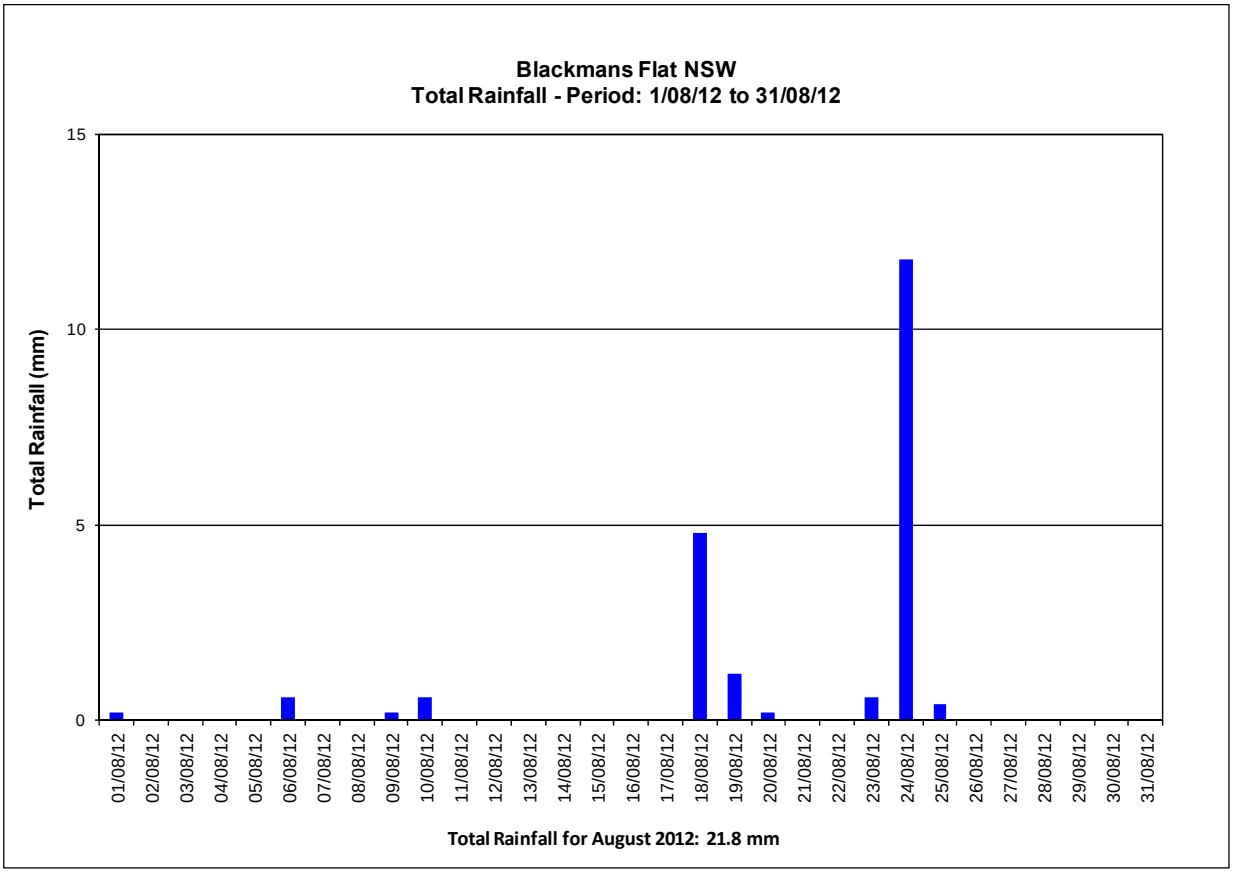

Pine Dale Mine
TSP & PM10 HVAS 12-Month Comparative Results
September 2011 - August 2012
TSP & PM10 (ug/m³)
100
90
80
70
60
50
40
30
20
10
0
5-Sep-11
17-Sep-11
29-Sep-11
11-Oct-11
23-Oct-11
4-Nov-11
16-Nov-11
28-Nov-11
10-Dec-11
22-Dec-11
3-Jan-12
15-Jan-12
27-Jan-12
8-Feb-12
20-Feb-12
3-Mar-12
15-Mar-12
27-Mar-12
8-Apr-12
20-Apr-12
2-May-12
14-May-12
26-May-12
07-Jun-12
19-Jun-12
1-Jul-12
13-Jul-12
25-Jul-12
6-Aug-12
18-Aug-12
30-Aug-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

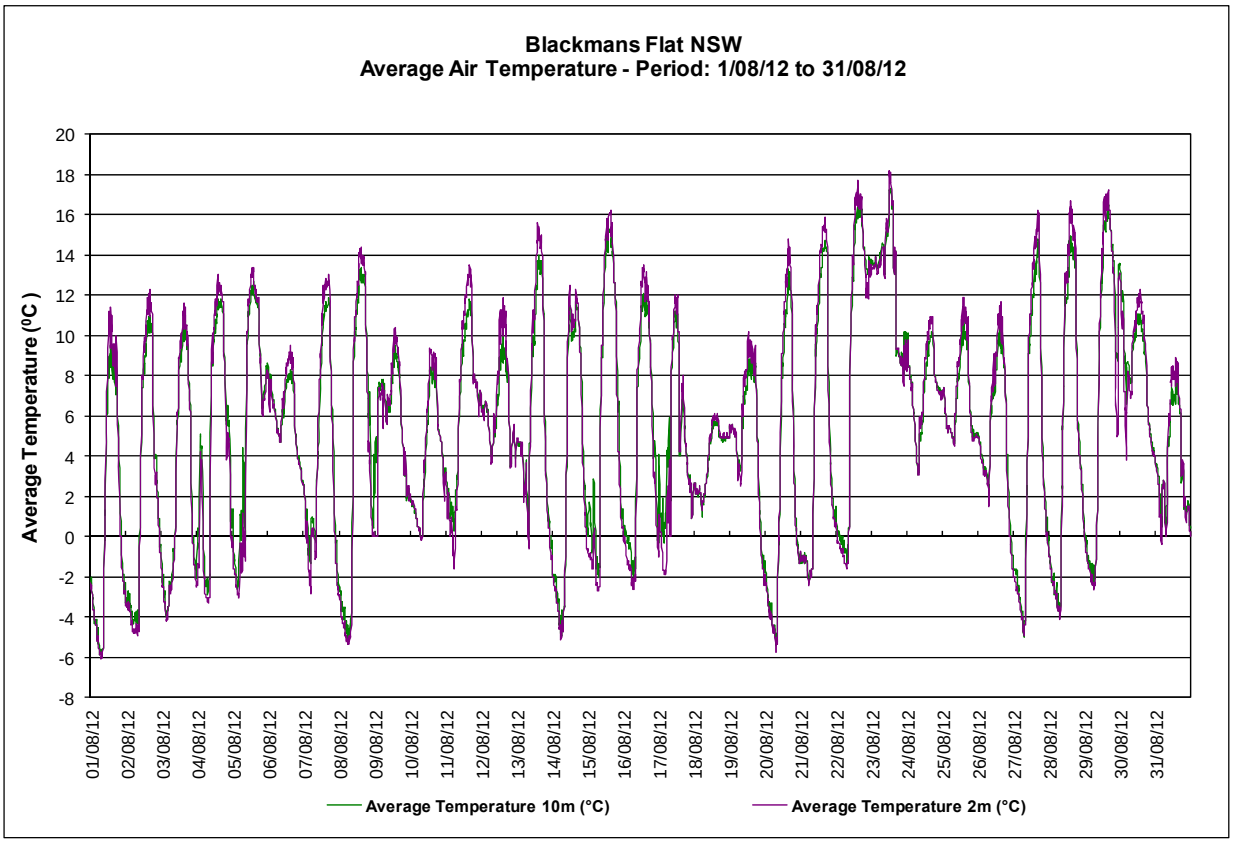

Pine Dale Mine
Blasting- Airblasting Overpressure
YTD 2012 Comparable Data
Overpressure (dB)
125.0
120.0
115.0
110.0
105.0
100.0
95.0
10/01/2012
10/02/2012
10/03/2012
10/04/2012
10/05/2012
10/06/2012
10/07/2012
10/08/2012
EPL 95% Compliance Limit- Overpressure
EPL 100% Compliance Limit- Overpressure
Park
Noon St.
Summer St.

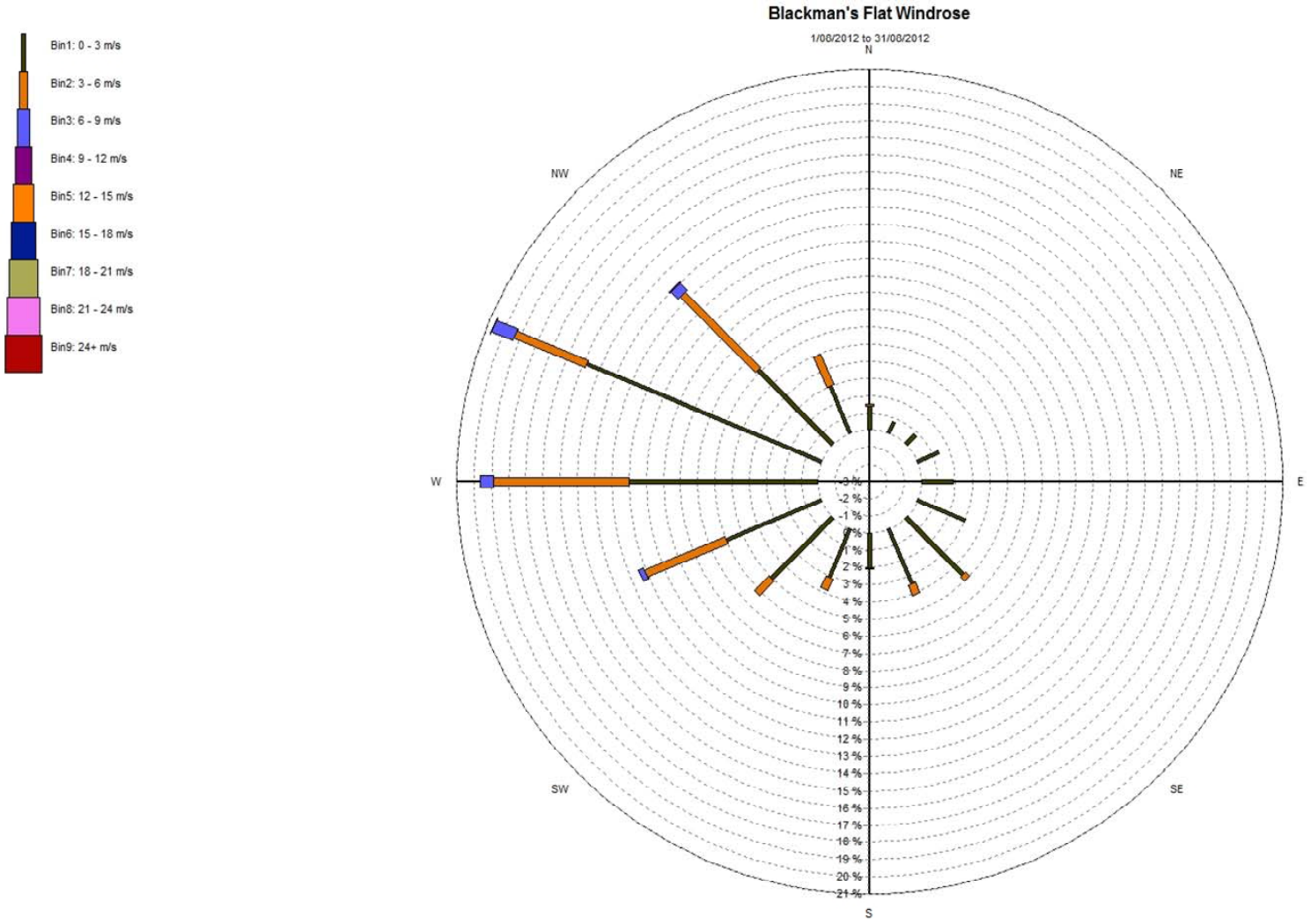

Pine Dale Mine
Blasting- Ground Vibration
YTD 2012 Comparable Data
Ground Vibration (mm/sec)
12.00
10.00
8.00
6.00
4.00
2.00
0.00
10/01/2012
10/02/2012
10/03/2012
10/04/2012
10/05/2012
10/06/2012
10/07/2012
10/08/2012
EPL 95% Compliance Limit- Vibration
EPL 100% Compliance Limit- Vibration
Park
Noon St.
Summer St.

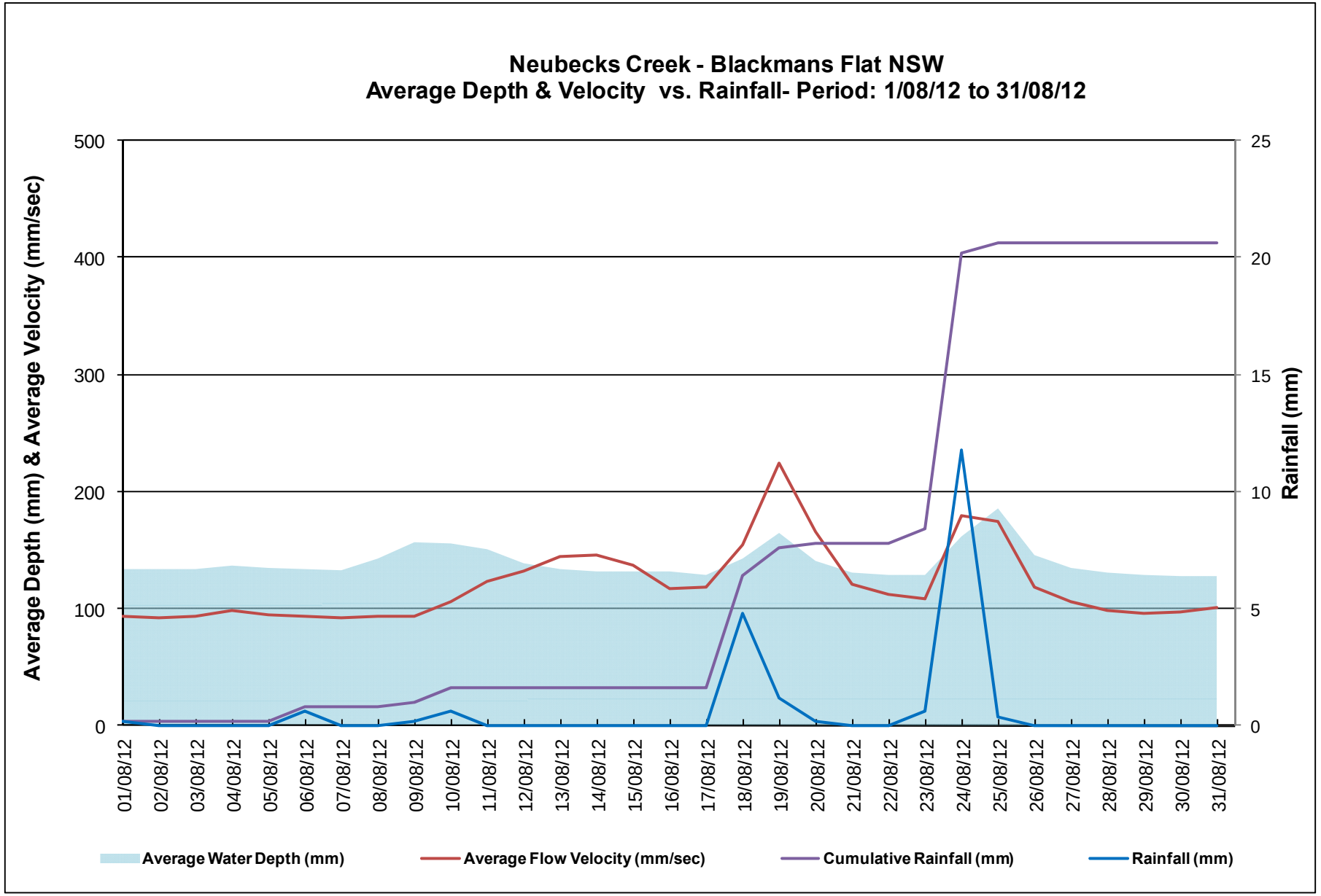
Appendix 3

Meteorological Data


Blackmans Flat NSW
Total Rainfall - Period: 1/08/12 to 31/08/12
Total Rainfall (mm)
15
10
5
0
01/08/12
02/08/12
03/08/12
04/08/12
05/08/12
06/08/12
07/08/12
08/08/12
09/08/12
10/08/12
11/08/12
12/08/12
13/08/12
14/08/12
15/08/12
16/08/12
17/08/12
18/08/12
19/08/12
20/08/12
21/08/12
22/08/12
23/08/12
24/08/12
25/08/12
26/08/12
27/08/12
28/08/12
29/08/12
30/08/12
31/08/12
Total Rainfall for August 2012: 21.8 mm


Blackmans Flat NSW
Average Air Temperature - Period: 1/08/12 to 31/08/12
Average Temperature (ºC)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
01/08/12
02/08/12
03/08/12
04/08/12
05/08/12
06/08/12
07/08/12
08/08/12
09/08/12
10/08/12
11/08/12
12/08/12
13/08/12
14/08/12
15/08/12
16/08/12
17/08/12
18/08/12
19/08/12
20/08/12
21/08/12
22/08/12
23/08/12
24/08/12
25/08/12
26/08/12
27/08/12
28/08/12
29/08/12
30/08/12
31/08/12
Average Temperature 10m (°C)
Average Temperature 2m (°C)


Blackman's Flat Windrose
1/08/2012 to 31/08/2012
N
NE
E
SE
S
SW
W
NW
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
-3 %
-2 %
-1 %
0 %
1 %
2 %
3 %
4 %
5 %
6 %
7 %
8 %
9 %
10 %
11 %
12 %
13 %
14 %
15 %
16 %
17 %
18 %
19 %
20 %
21 %


Neubecks Creek - Blackmans Flat NSW
Average Depth & Velocity vs. Rainfall- Period: 1/08/12 to 31/08/12
Average Depth (mm) & Average Velocity (mm/sec)
Rainfall (mm)
500
400
300
200
100
0
25
20
15
10
5
0
01/08/12
02/08/12
03/08/12
04/08/12
05/08/12
06/08/12
07/08/12
08/08/12
09/08/12
10/08/12
11/08/12
12/08/12
13/08/12
14/08/12
15/08/12
16/08/12
17/08/12
18/08/12
19/08/12
20/08/12
21/08/12
22/08/12
23/08/12
24/08/12
25/08/12
26/08/12
27/08/12
28/08/12
29/08/12
30/08/12
31/08/12
Average Water Depth (mm)
Average Flow Velocity (mm/sec)
Cumulative Rainfall (mm)
Rainfall (mm)