Monthly Environmental Data May 2015

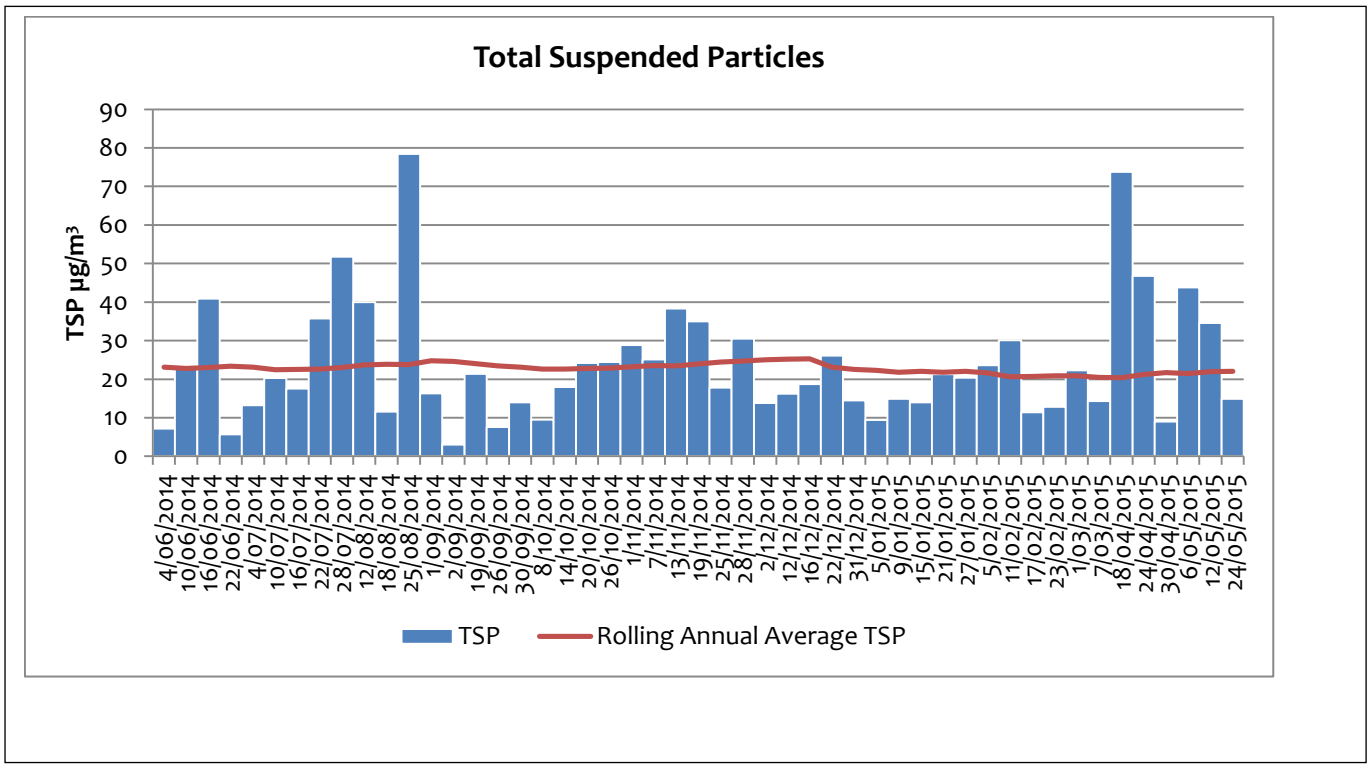
Contents

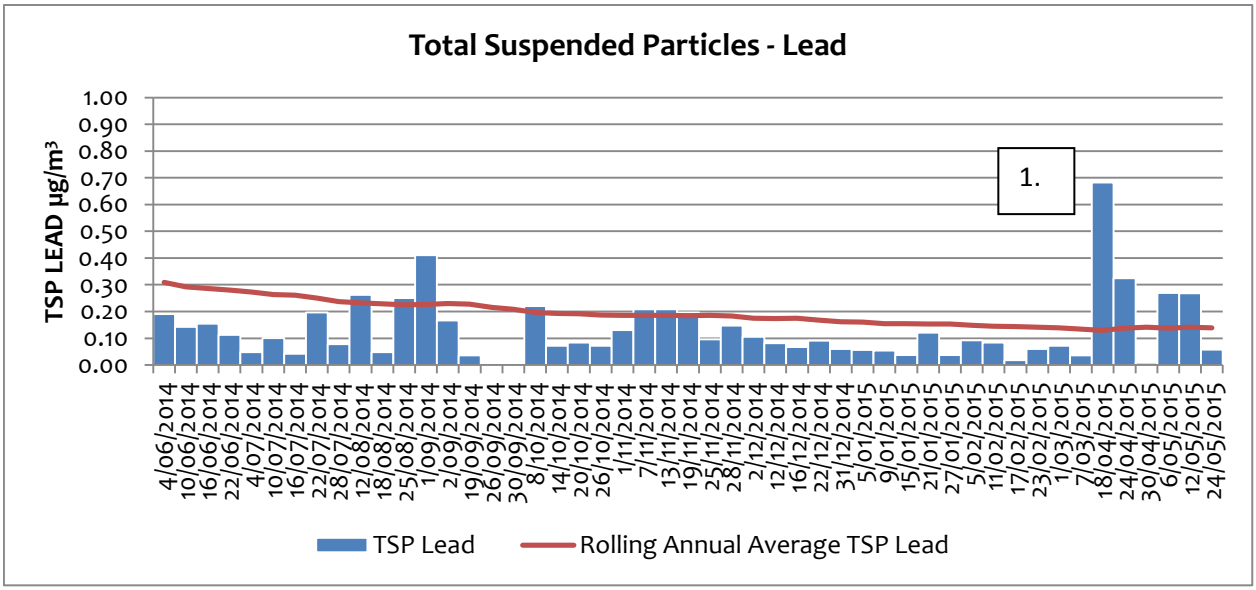
1 Air Quality

1.1 High Volume Air Samplers

EPL10 - SILVER TANK - ON SITE

DATE	TSP (µg/m^3)	Lead (µg/m^3)
6/05/2015	43.80	0.27
12/05/2015	34.60	0.27
24/05/2015	14.90	0.06
HVA1 had a power failure on 18th May and missed a scheduled sample. Power failures were due to offsite grid maintenance being conducted by Essential Energy.		

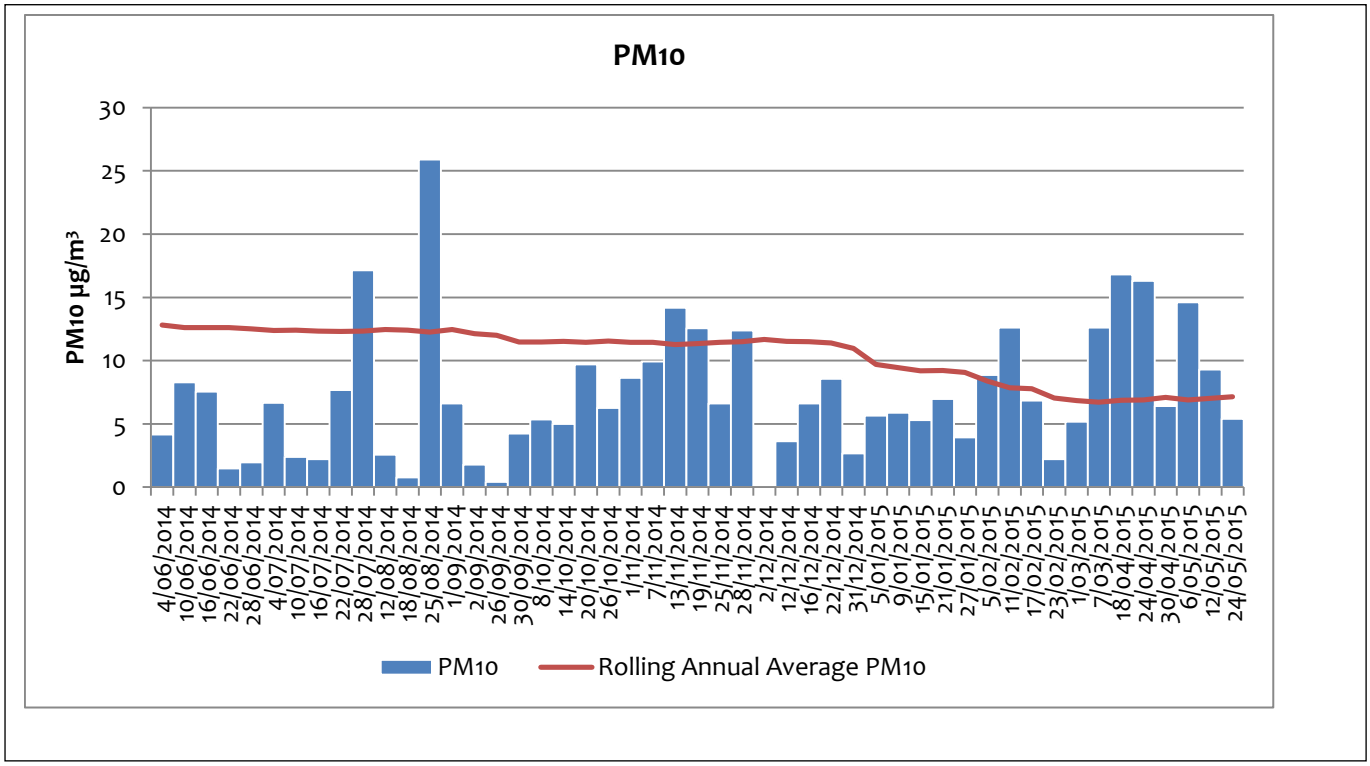


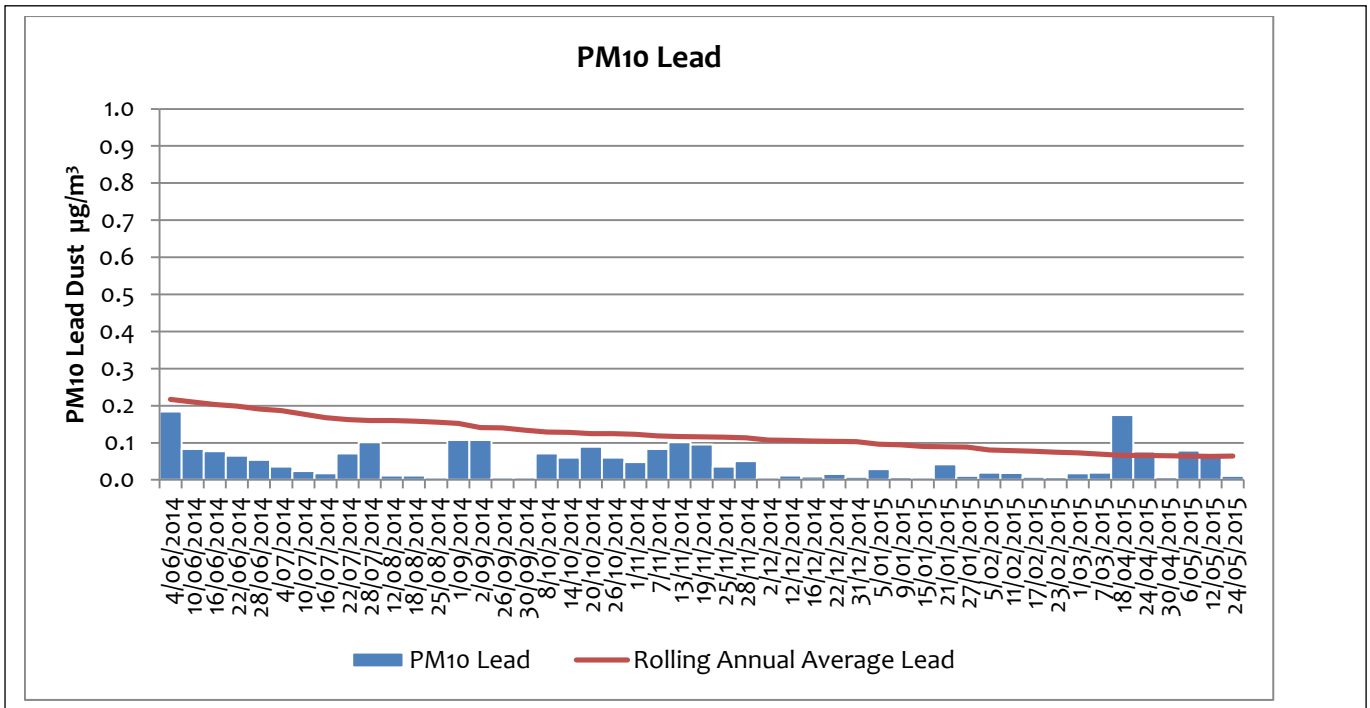


1. Spike on the 18th was investigated. Lab QC was okay with no evidence of lab contamination. Wind conditions were not extraordinary and it rained. Field sampling methods have been checked to prevent any sample contamination.

EPL11 - Silver Tank - On Site

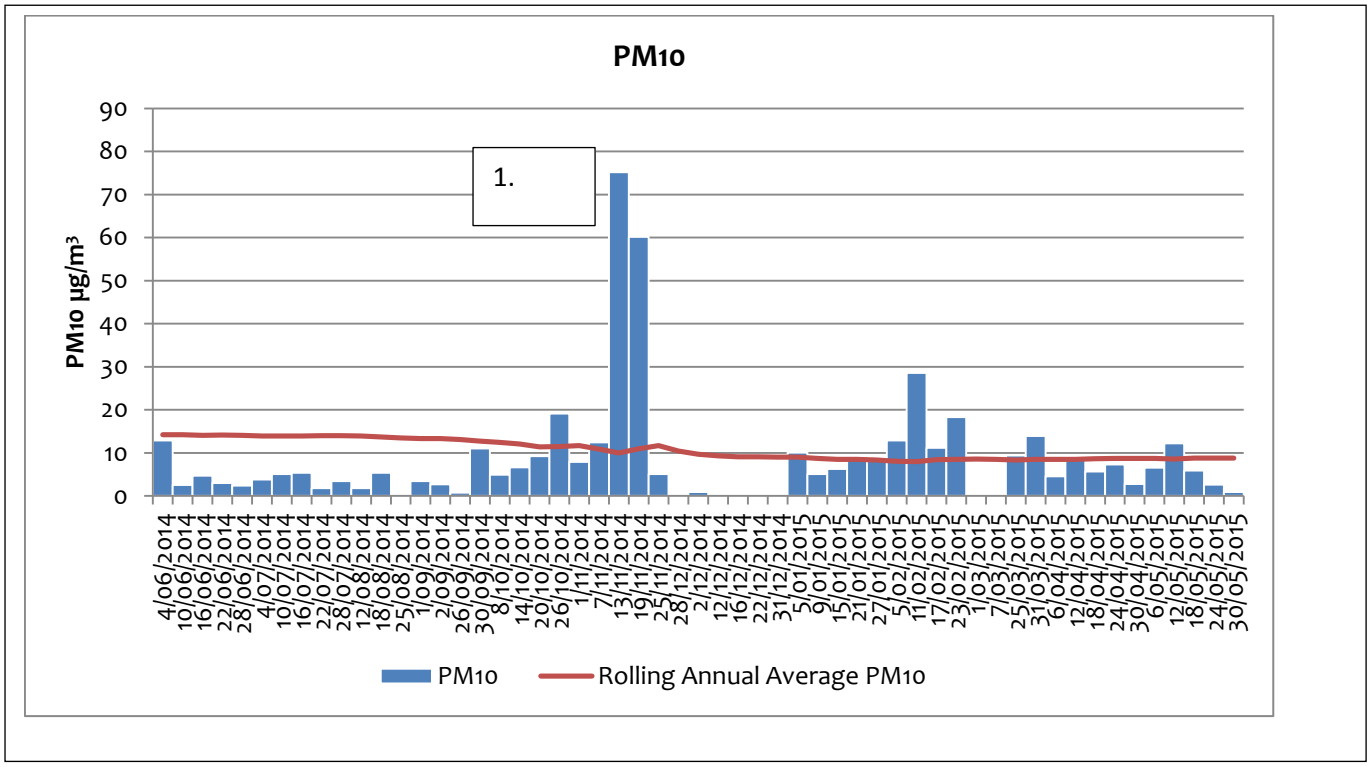
DATE	PM10 (µg/m³)	Lead (µg/m³)
6/05/2015	14.60	0.08
12/05/2015	9.30	0.07
24/05/2015	5.40	0.01
HVA2 had a power failure on May 18th and missed a scheduled sample. Power failures were due to offsite grid maintenance being conducted by Essential Energy.		


PM10
PM10 µg/m³
30
25
20
15
10
5
0
4/06/2014
10/06/2014
16/06/2014
22/06/2014
28/06/2014
4/07/2014
10/07/2014
16/07/2014
22/07/2014
28/07/2014
12/08/2014
18/08/2014
25/08/2014
1/09/2014
2/09/2014
26/09/2014
30/09/2014
8/10/2014
14/10/2014
20/10/2014
26/10/2014
1/11/2014
7/11/2014
13/11/2014
19/11/2014
25/11/2014
28/11/2014
2/12/2014
12/12/2014
16/12/2014
22/12/2014
31/12/2014
5/01/2015
9/01/2015
15/01/2015
21/01/2015
27/01/2015
5/02/2015
11/02/2015
17/02/2015
23/02/2015
1/03/2015
7/03/2015
18/04/2015
24/04/2015
30/04/2015
6/05/2015
12/05/2015
24/05/2015
PM10
Rolling Annual Average PM10

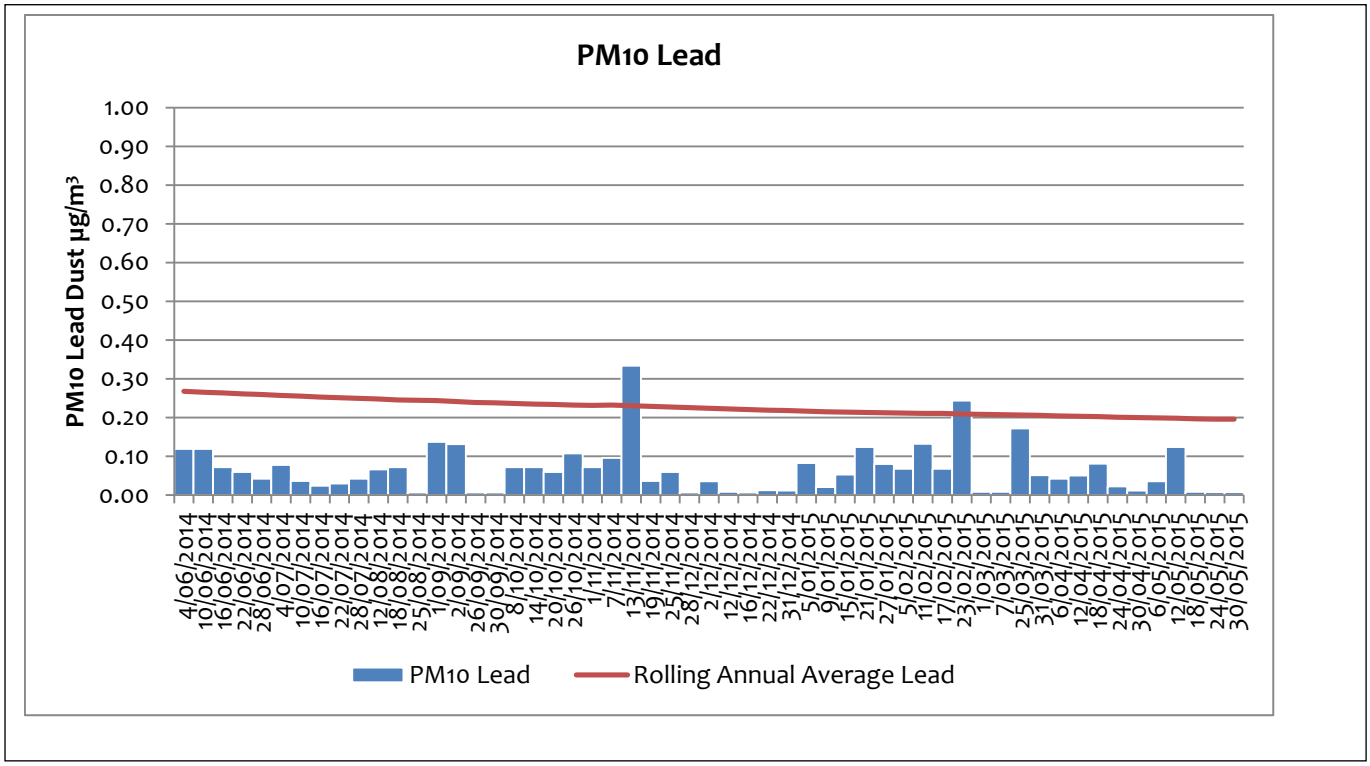

PM10 Lead
PM10 Lead Dust µg/m³
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
4/06/2014
10/06/2014
16/06/2014
22/06/2014
28/06/2014
4/07/2014
10/07/2014
16/07/2014
22/07/2014
28/07/2014
12/08/2014
18/08/2014
25/08/2014
1/09/2014
2/09/2014
26/09/2014
30/09/2014
8/10/2014
14/10/2014
20/10/2014
26/10/2014
1/11/2014
7/11/2014
13/11/2014
19/11/2014
25/11/2014
28/11/2014
2/12/2014
12/12/2014
16/12/2014
22/12/2014
31/12/2014
5/01/2015
9/01/2015
15/01/2015
21/01/2015
27/01/2015
5/02/2015
11/02/2015
17/02/2015
23/02/2015
1/03/2015
7/03/2015
18/04/2015
24/04/2015
30/04/2015
6/05/2015
12/05/2015
24/05/2015
PM10 Lead
Rolling Annual Average Lead

EPL12 - Blackwoods Pit – On Site

DATE	PM10 (µg/m^3)	Lead (µg/m^3)
6/05/2015	6.6	0.035
12/05/2015	12.2	0.124
18/05/2015	5.9	0.008
24/05/2015	2.6	0.007
30/05/2015	0.9	0.007



1. High dust values in November coincide with road works that were carried out by Broken Hill City Council on Federation Way in the vicinity of Blackwoods Pit.

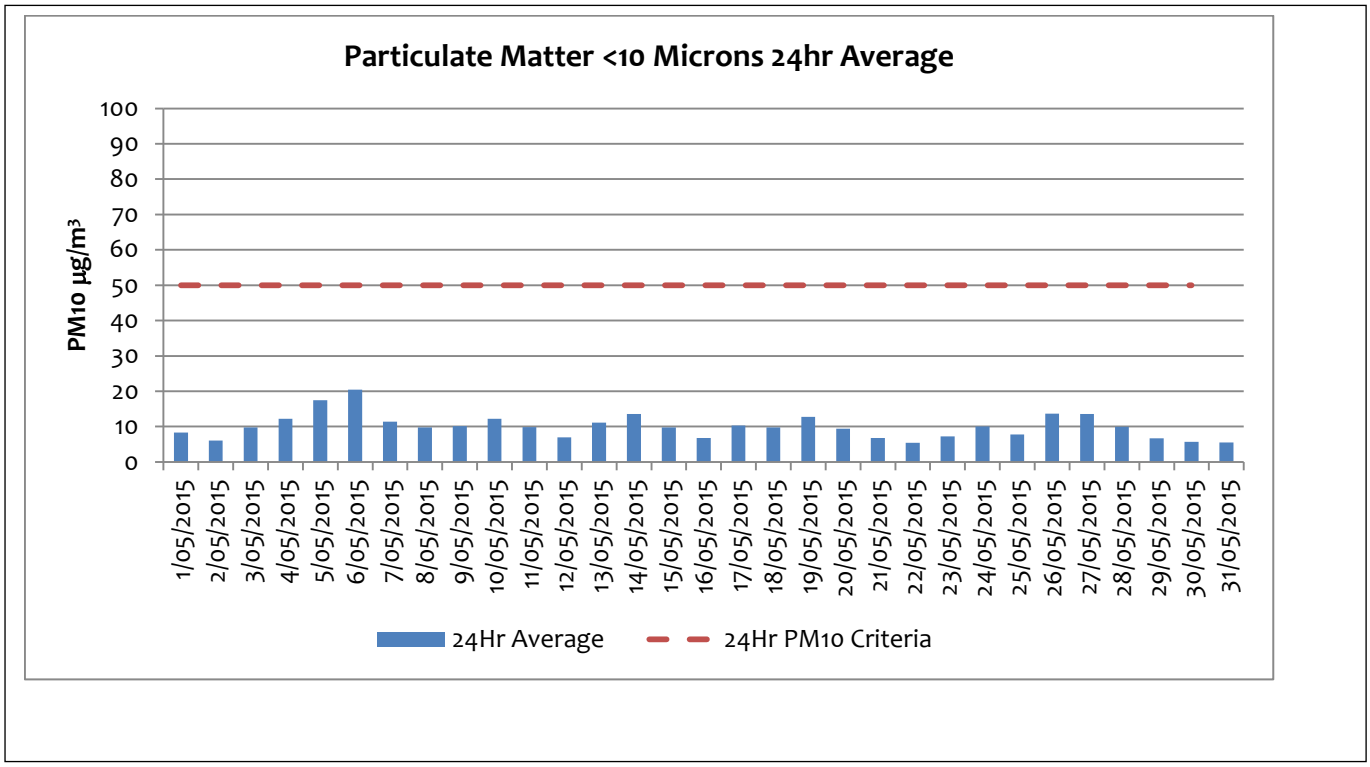

PM10 Lead
PM10 Lead Dust µg/m³
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
4/06/2014
10/06/2014
16/06/2014
22/06/2014
28/06/2014
4/07/2014
10/07/2014
16/07/2014
22/07/2014
28/07/2014
12/08/2014
18/08/2014
25/08/2014
1/09/2014
2/09/2014
26/09/2014
30/09/2014
8/10/2014
14/10/2014
20/10/2014
26/10/2014
1/11/2014
7/11/2014
13/11/2014
19/11/2014
25/11/2014
28/12/2014
2/12/2014
12/12/2014
16/12/2014
22/12/2014
31/12/2014
5/01/2015
9/01/2015
15/01/2015
21/01/2015
27/01/2015
5/02/2015
11/02/2015
17/02/2015
23/02/2015
1/03/2015
7/03/2015
25/03/2015
31/03/2015
6/04/2015
12/04/2015
18/04/2015
24/04/2015
30/04/2015
6/05/2015
12/05/2015
18/05/2015
24/05/2015
30/05/2015
PM10 Lead
Rolling Annual Average Lead

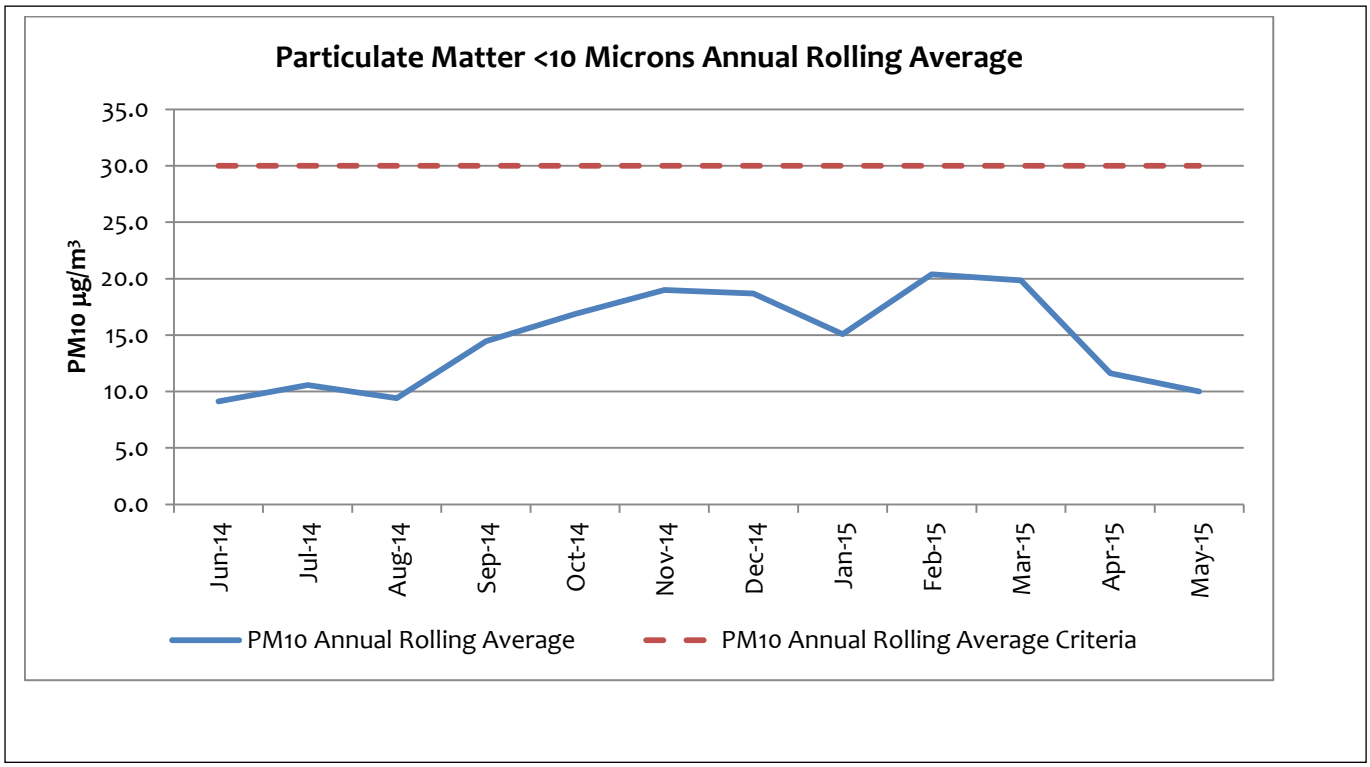
1.2 Tapered Element Oscillating Microbalance Sampling (TEOM)

Particulate Matter <10 Microns 24Hr Average		
Date	TEOM 1 - EPL 13 (μg/m^3) Essential Water – Off Site	TEOM 2 – EPL 14 (μg/m^3) Blackwoods Pit – On Site
1/05/15	8.35	8.88
2/05/15	6.02	6.50
3/05/15	9.78	10.83
4/05/15	12.24	11.62
5/05/15	17.43	14.72
6/05/15	20.41	19.86
7/05/15	11.41	12.69
8/05/15	9.75	11.24
9/05/15	10.09	11.00
10/05/15	12.16	11.09
11/05/15	9.85	8.99
12/05/15	6.92	7.10
13/05/15	11.13	17.21
14/05/15	13.58	22.12
15/05/15	9.77	14.94
16/05/15	6.75	9.22
17/05/15	10.31	11.24
18/05/15	9.79	9.61
19/05/15	12.71	10.68
20/05/15	9.41	9.88
21/05/15	6.76	8.35
22/05/15	5.44	8.60
23/05/15	7.25	9.86
24/05/15	10.05	10.43
25/05/15	7.76	7.04
26/05/15	13.70	11.16
27/05/15	13.59	13.16
28/05/15	9.95	10.22
29/05/15	6.65	7.11
30/05/15	5.64	6.13
31/05/15	5.54	5.58

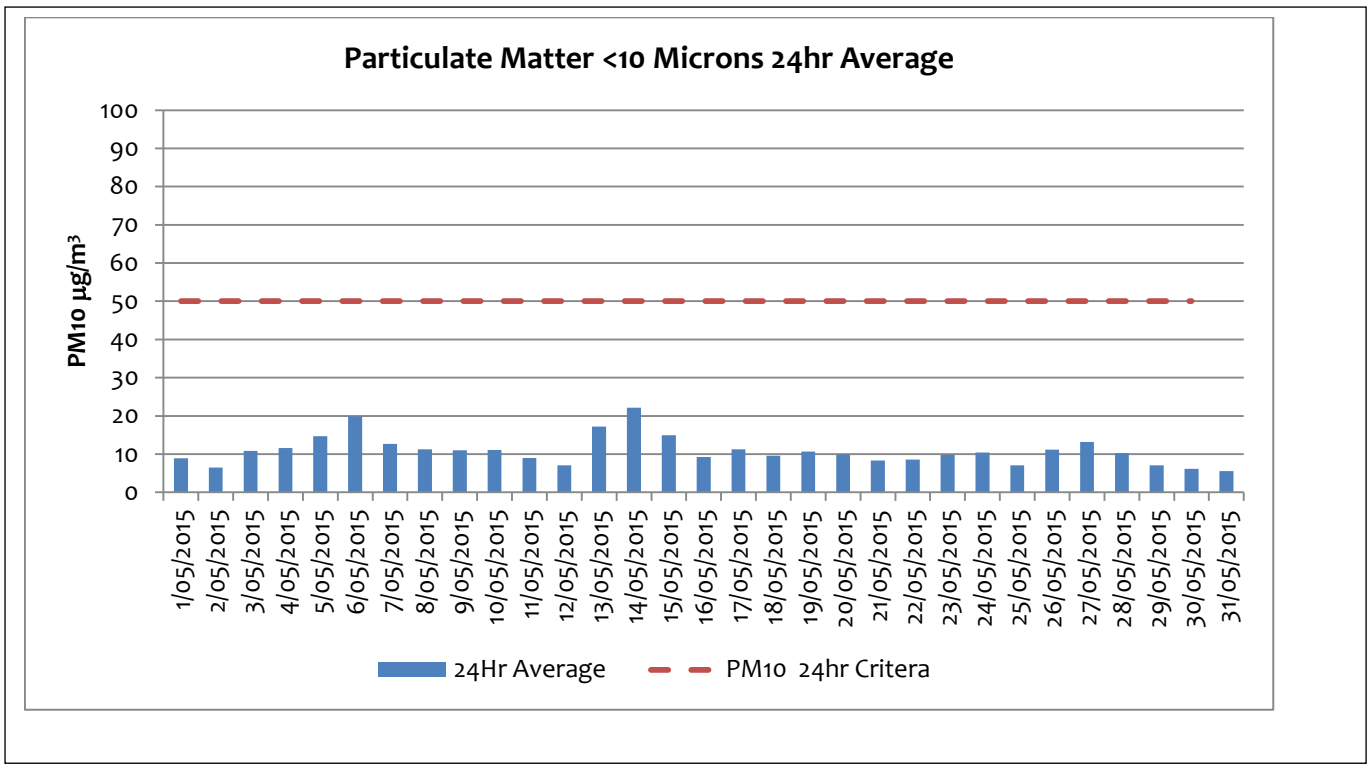
PM10 μg/m^3 12 Month Rolling Average												
	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15
TEOM 1 EPL13 Essential Water Off Site	9.1	10.6	9.4	14.4	16.9	19.0	18.7	15.1	20.4	19.8	11.6	10.0
TEOM 2 EPL14 Blackwoods Pit On Site	9.3	11.5	12.4	27.2	15.7	20.8	27.4	16.5	21.6	22.0	15.1	10.9

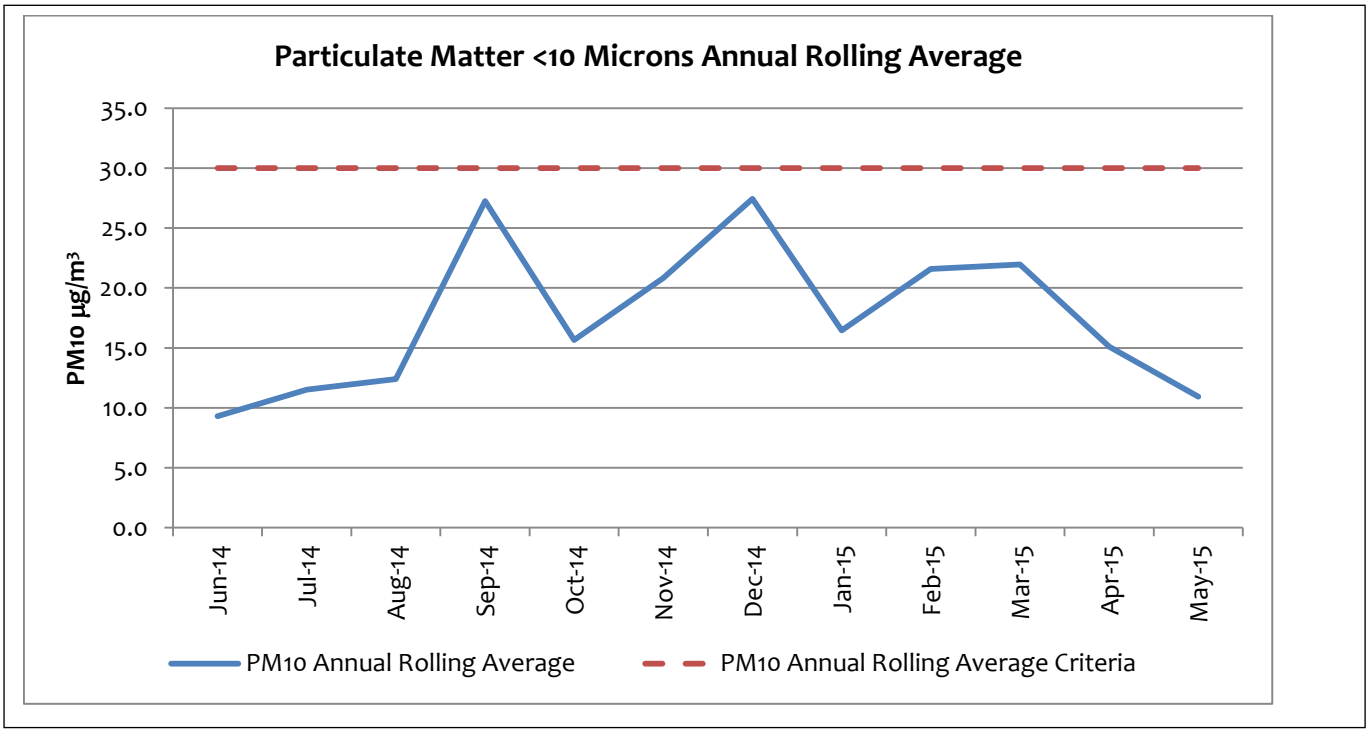
EPL13 – Essential Water – Off Site





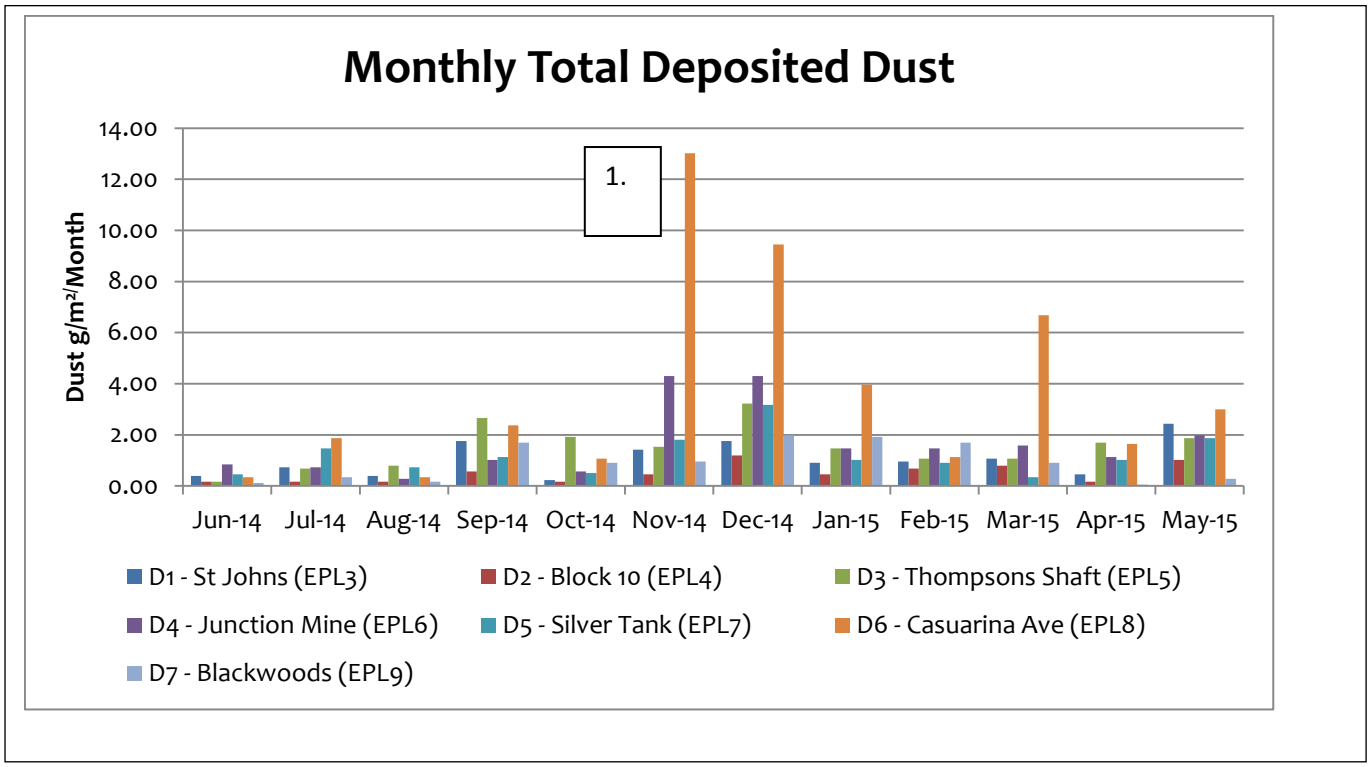
EPL14 – Blackwoods Pit – On Site





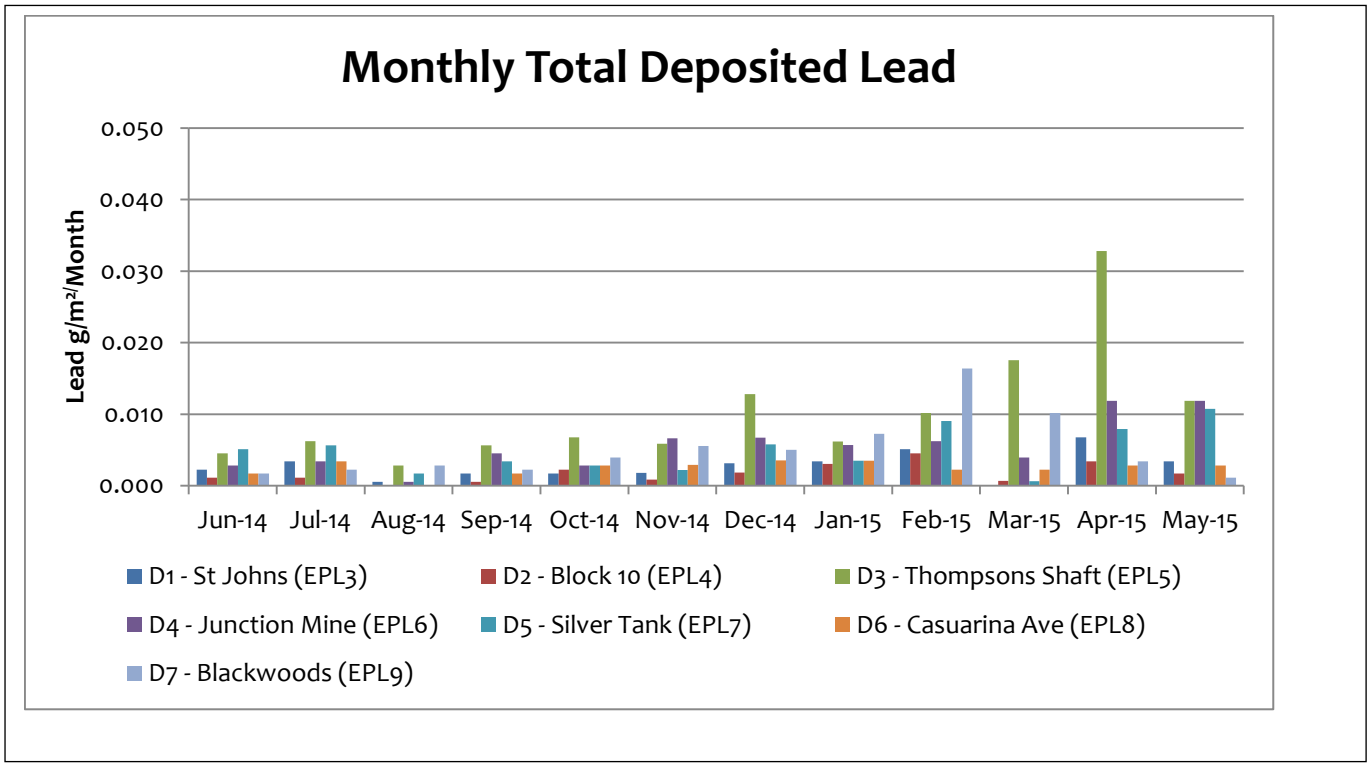
1.3 Dust Deposition Sampling

Total Deposited Dust (g/m$^{2/}$Month)							
Date	D1 (off site)	D2	D3	D4	D5	D6 (off site)	D7
May 2015	2.43	1.02	1.87	1.98	1.87	3.00	0.28
Background Average	4.0	3.1	4.3	5.7	n/a	5.8	n/a



1. Samples at Casuarina Ave appear to have been tampered with in November and December 2014 as well as March 2015. These jars when picked up had large volumes of water present.

Total Deposited Lead (g/m$^{2/}$Month)							
Date	D1 (Off Site)	D2	D3	D4	D5	D6 (Off Site)	D7
May 2015	0.003	0.002	0.012	0.012	0.011	0.003	0.001
Background Average	0.0000	0.001	0.0018	0.0040	0.0010	0.0020	0.0100



2 Blasting (Vibration and Overpressure)

<u>Note:</u> Vibration is recorded in Peak Particle Velocity (ppv), Overpressure is recorded in Decibels (dBL)

Block 7 will not have 12 months of data until May next year, therefore no calculation on percentage of blasts over 5mm/sec can be given.

May Summary Block 7, Zinc Lode:

- 0 production firings
- 49 development firings
- 2 Blasts recorded a ppv of >3mm/s
- 0 Blasts recorded a ppv of >10mm/s
- 0 Blasts recorded an over pressure level over 115 (dBL)
- 0 Blasts recorded an over pressure above 120 (dBL)

May Summary Rest of Mine, Western Mineralisation and Main Lode:

- 13 production firings
- 130 development firings
- 0 Blasts recorded a ppv of >5mm/s
- 0 Blasts recorded a ppv of >10mm/s
- 0 Blasts recorded an over pressure level over 115 (dBL)
- 0 Blasts recorded an over pressure above 120 (dBL)
- % of all blasts over 5mm/sec **0.39%** (licence requirement <5%) calculated from 1st July 2014 until June17, 2015.

3 Noise

Quarterly noise monitoring is continuing as per the Pollution Reduction Program on EPL 12559. Two noise assessments have been undertaken since November last year. EMGA Mitchell McLennan Pty Limited (EMM) completed the analysis for both assessments. The latest report concluded as follows:

"EMM has completed a noise monitoring assessment of operational noise from RASP Mine activities as per the site's EPL (12559). The monitoring assessment for this second quarterly survey found that noise limits were inapplicable due to meteorological conditions, notwithstanding noise from RASP Mine operations (including the crushing plant) were below the noise limits at most locations, and for most measurements. Subsequent additional attended measurements identified site noise to be below the relevant noise limits hence reaffirming compliance at all locations."

The report is published in full on the CBH website. The next monitoring round is scheduled for July.

4 Water

4.1 Ground Water Sampled 13/05/2015

		UG FEED	GW03	GW04	GW05	GW06	GW07	HORWOODS DAM	GW09	GW10	GW11	GW12	SHAFT 7
pH Value	pH Unit	6.3	6.41	6.9	6.25	6.22	6.22	6.57	7.46	6.93	7.22	6.15	6.45
Electrical Conductivity @ 25°C	µS/cm	10300	15000	14400	16900	13800	13100	16500	10700	12800	3360	13500	11800
Total Dissolved Solids @180°C	mg/L	7850	12500	10900	14800	11600	11300	14800	8720	10300	2040	12900	10000
Hydroxide Alkalinity as CaCO3	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	mg/L	12	33	217	169	49	26	9	340	200	105	86	28
Total Alkalinity as CaCO3	mg/L	12	33	217	169	49	26	9	340	200	105	86	28
Sulfate as SO4 - Turbidimetric	mg/L	5480	5840	4660	7240	4980	4700	7850	3280	4290	1400	6110	5960
Chloride	mg/L	1260	3350	2880	3040	2710	2500	2910	2260	2370	365	1940	1560
Calcium	mg/L	489	606	607	557	564	569	582	792	570	118	495	527
Magnesium	mg/L	246	446	558	813	540	440	561	522	490	121	656	342
Sodium	mg/L	1220	2420	2450	2970	2280	2170	2550	1190	2070	470	2360	1540
Cadmium	mg/L	2.43	1.59	0.326	0.942	0.803	3.71	3.66	0.0229	0.436	0.0143	1.41	1.79
Lead	mg/L	0.221	0.632	0.107	0.445	0.094	0.911	1.65	<0.001	<0.001	0.002	0.075	2.01
Manganese	mg/L	420	364	93.2	377	336	419	738	0.568	35.2	21.6	74	522
Zinc	mg/L	1250	312	46.5	316	206	261	1390	1.78	55.7	25	217	1110
Iron	mg/L	2	1.15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.05	<0.05	<0.05	<0.10	0.13

4.2 Surface Water

Insufficient rainfall for opportunistic surface water sampling during May 2015

Surface Water Table Nov 2014 to Nov 2015

EPA Identification Number	Frequency	Comment
EPL29	2 x Per year when contains water	Insufficient water for sample
EPL30	2 x Per year when contains water	Insufficient water for sample
EPL31	2 x Per year when contains water	Sampled during January
EPL32	2 x Per year when contains water	Insufficient water for sample
EPL33 Horwood Dam	2 x Per year when contains water	Sampled in May
EPL34 Upstream	2 x Per year when contains water	Insufficient water for sample
EPL35 Downstream	2 x Per year when contains water	Insufficient water for sample

5 Weather Data

BHOP – Automatic Weather Station was unavailable for the month of April. Currently a new weather station is planned for June 2015.

The following data was obtained from the Bureau of Meteorology Broken Hill

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
1	Fr	6.7	21.2	1.0			ENE	31	08:14	14.8	86	1	ENE	19	1023.7	19.7	58	7	NE	20	1020.7
2	Sa	11.5	24.7	0			WSW	31	12:04	16.3	72	6	NW	7	1020.9	24.0	37	2	SW	17	1017.0
3	Su	9.5	23.5	0			SW	28	15:22	13.2	72	0	SE	19	1021.5	21.8	39	1	WSW	15	1018.4
4	Mo	11.2	25.8	0			N	46	22:26	16.5	54	0	NNE	17	1016.7	25.4	27	1	NNW	22	1012.1
5	Tu	15.5	20.6	0			WSW	65	11:42	16.3	40	1	W	41	1012.2	20.1	34	1	W	39	1012.3
6	We	8.1	19.1	0			WSW	39	14:43	12.1	67	1	WSW	24	1022.5	18.3	39	1	WSW	28	1020.6
7	Th	9.3	16.9	0			SW	39	10:39	13.3	70	1	SSW	20	1026.3	16.2	49	6	SW	26	1024.9
8	Fr	6.7	18.4	0			SW	30	14:51	11.0	77	1	SW	7	1026.8	16.7	48	2	SSW	20	1022.7
9	Sa	8.2	19.3	0			W	43	13:16	12.9	66	1	WNW	13	1023.5	18.2	41	1	WNW	26	1019.4
10	Su	9.3	20.7	0			WNW	57	10:31	12.9	59	1	NW	31	1017.9	19.9	49	6	W	39	1015.9
11	Mo	10.6	21.8	0			W	41	13:17	14.9	73	1	W	22	1021.7	21.2	46	1	WSW	24	1019.7
12	Tu	9.9	19.4	0			SW	61	23:16	13.6	73	7	WSW	22	1021.5	18.0	52	4	SW	19	1019.4
13	We	5.6	13.3	0			SSW	61	01:30	7.5	70	0	SSW	35	1029.4	13.0	33	1	S	33	1029.5
14	Th	3.8	15.3	0			SSE	46	11:53	7.6	87	0	S	24	1036.7	14.6	46	1	SSW	28	1034.1
15	Fr	7.7	16.0	0			S	44	14:06	10.0	84	2	SSE	24	1036.3	15.2	56	1	S	30	1032.1
16	Sa	4.4	19.8	0.2			E	30	13:54	7.9	95	1	S	9	1034.2	19.3	41	1	ESE	17	1029.8
17	Su	7.9	23.8	0			NE	35	10:23	14.8	59	2	NE	20	1031.4	21.8	39	3	ENE	17	1027.5
18	Mo	10.9	23.8	0			NNE	37	10:19	15.7	57	1	NE	20	1026.4	23.2	41	7	N	13	1021.2
19	Tu	15.6	24.0	0			NW	67	13:39	18.6	55	3	NNW	24	1015.1	19.9	78	6	WNW	24	1011.9
20	We	10.8	17.3	5.2			WSW	30	17:51	11.6	94	8	W	13	1018.3	16.4	61	7	SW	13	1017.9
21	Th	7.7	12.2	1.2			SSW	44	14:39	8.7	99	8	SSW	22	1023.9	11.8	69	7	SSW	33	1023.9
22	Fr	7.6	14.4	0.2			SSW	43	08:52	8.7	93	8	SSW	33	1028.8	13.4	70	5	S	26	1027.5
23	Sa	4.9	15.9	0.2			ESE	26	02:56	5.9	100	2	ESE	9	1031.7	14.9	50	6	SE	15	1028.5
24	Su	6.1	18.3	0			NE	28	10:45	10.0	73	7	ENE	11	1029.8	17.2	52	7	ENE	13	1027.9
25	Mo	9.8		0			NE	26	09:40	12.0	82	7	NE	17	1030.0	19.7	45	7	NE	7	1026.2
26	Tu						N	20	10:44				NNE	9	1027.0				NNE	11	1022.6
27	We		22.6	2.8			NW	35	05:10				N	11	1023.4	20.4	65	7	WNW	15	1020.3
28	Th	11.9	21.0	1.6			NW	31	14:02	14.6	90	8	Calm		1021.3	16.2	86	8	NW	17	1019.4
29	Fr	12.0	14.3	1.6			WNW	28	00:12	12.6	87	8	SSE	13	1025.0	14.3	81	7	ESE	11	1023.9
30	Sa	11.5	12.8	1.4			NE	19	06:15	11.7	100	8	ENE	13	1024.4	12.3	96	8	E	7	1021.3
31	Su	8.2	17.3	2.6			WSW	35	13:16	9.9	93	2	SSW	11	1021.6	16.5	52	1	WSW	20	1018.4
Statistics for May 2015																					
Mean		9.1	19.1							12.3	76	3		18	1024.8	18.0	52	4		20	1022.2
Lowest		3.8	12.2	0						5.9	40	0	Calm		1012.2	11.8	27	1	#	7	1011.9
Highest		15.6	25.8	5.2			NW	67		18.6	100	8	W	41	1036.7	25.4	96	8	W	39	1034.1
Total				18.0																	

IDCJDW2020.201505. Prepared at 13:36 EST on Wednesday 17 June 2015.

Legend

Dir = Direction, **Spd**=Wind Speed, **Temp**=Temperature, **RH**=Relative Humidity, **CLD**=Cloud, **MSLP**=Mean Sea Level Pressure

6 Data Log

Sample	Date sent to lab	Result Received	Date Published
Hi Volume Samples	4/6/2015	11/6/2015	24/6/2015
TEOM	Real time	-	24/6/2015
Dust Deposition	3/6/2015	15/6/2015	24/6/2015
Water	15/5/2015	22/5/2015	24/6/2015
Blast Vibration and overpressure	Real Time	-	24/6/2015

A foam box containing dust deposition jars was lost by the courier during April. They were reported missing by the lab and eventually recovered and processed.

7 Correction Log May 2015

There are no data corrections for May 2015. However there have been some improvements in the reported data. Concentrations of dust and lead as a component of dust in the hi vol analysis are now NATA accredited. Concentration was previously calculated in house from reported totals on the filter papers.