

Monthly Environmental Data February 2016

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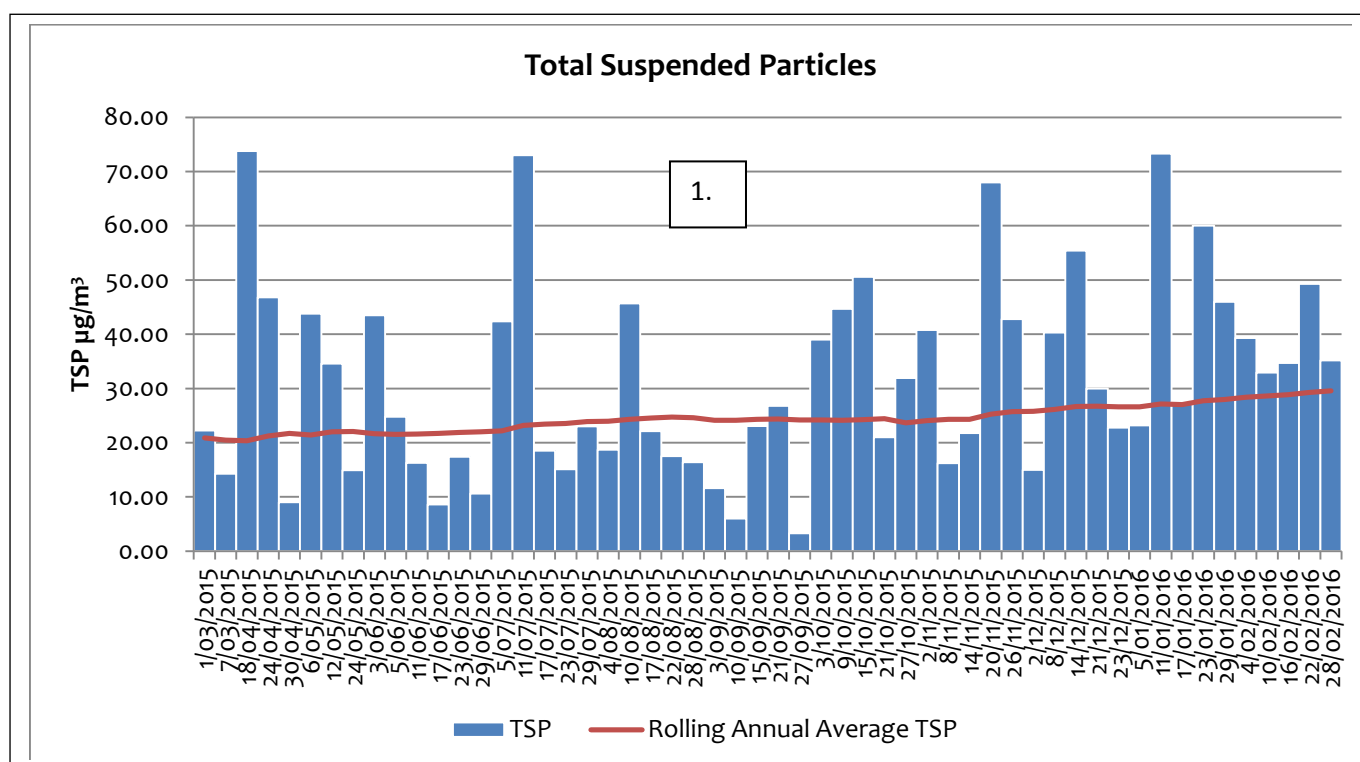
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1 Air Quality

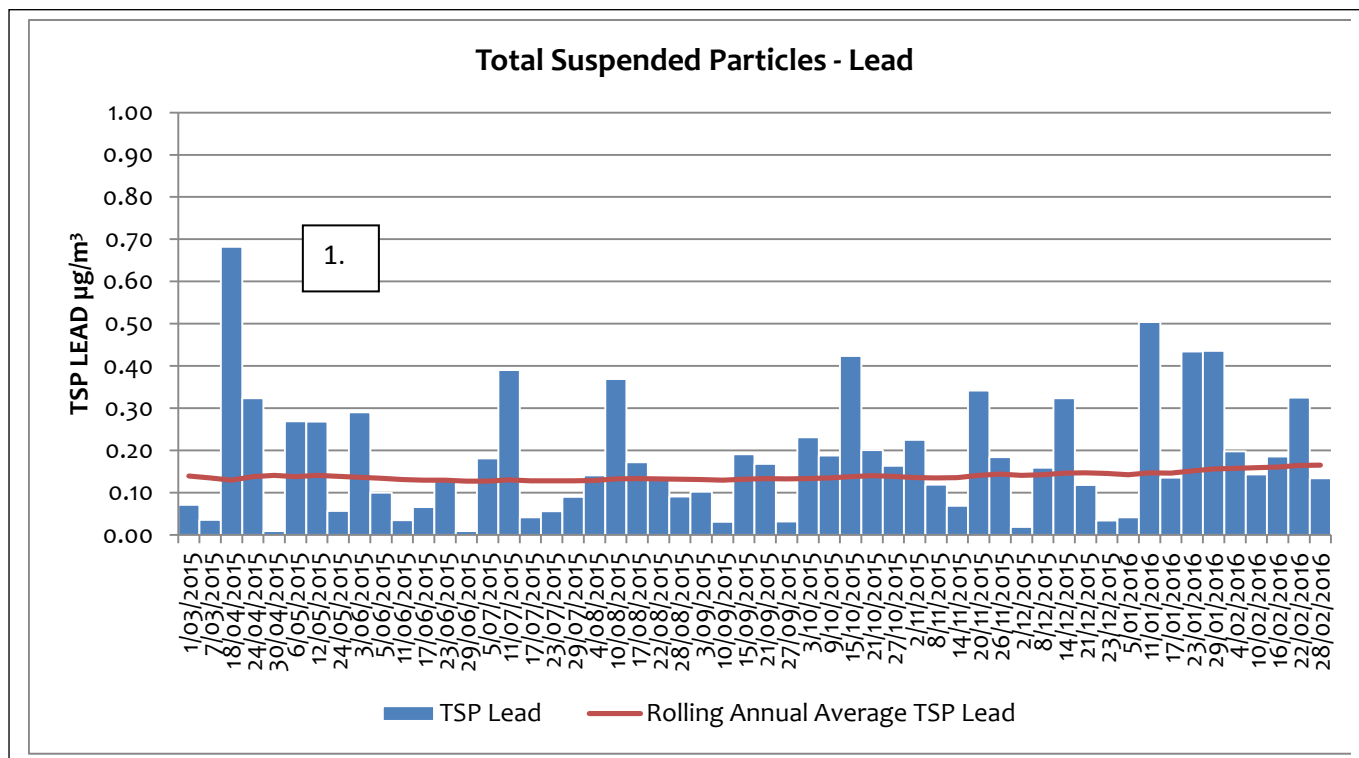
1.1 High Volume Air Samplers

EPL10 - SILVER TANK - ON SITE

DATE	TSP ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
4/02/2016	39.30	0.20
10/02/2016	32.90	0.14
16/02/2016	34.70	0.19
22/02/2016	49.30	0.33
28/02/2016	35.20	0.13



1. Spike on the 18th April 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. The spike on the 11th July also occurred when conditions were considered normal with 15km/h winds from a SE direction. Lab QC was okay, this may have been due to earthmoving activity (grading) in the local area. The spike on the 20th November coincides with 70kmh gusts coming from a westerly direction. On the 11th January gusts were recorded up to 65km/h in a WSW direction.

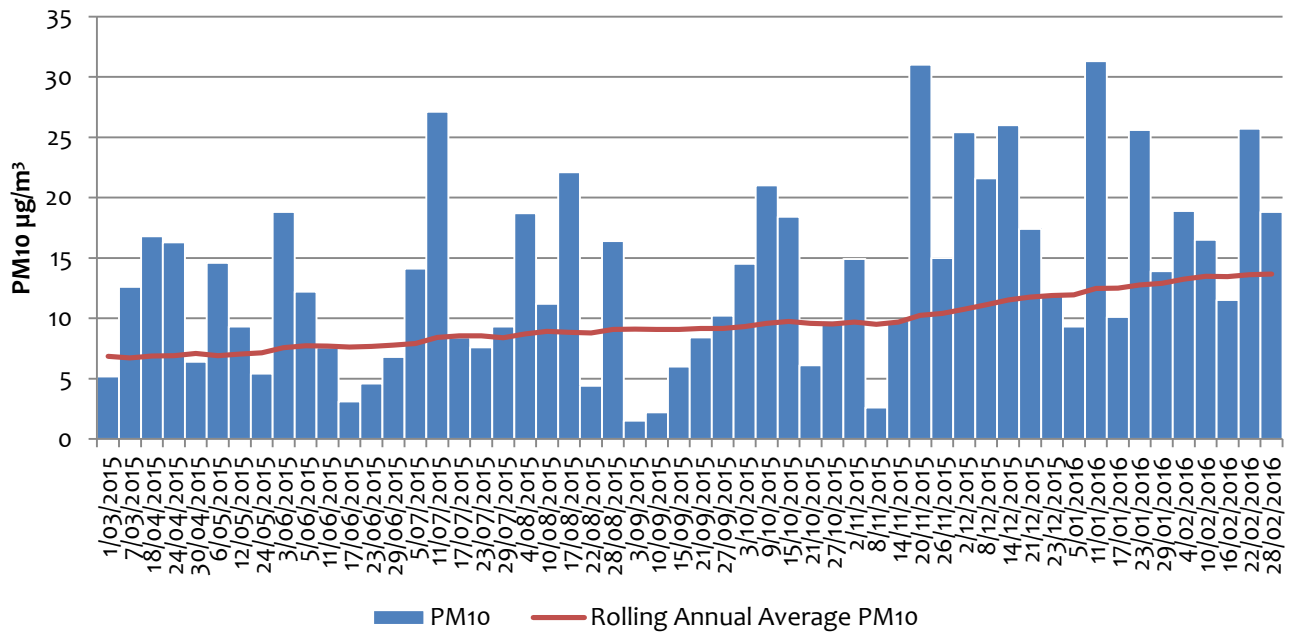


2. Spike on the 18th April was investigated. Lab QC was okay with no evidence of lab contamination. Wind conditions were not extraordinary and it rained. Field sampling methods have been checked to prevent any sample contamination.

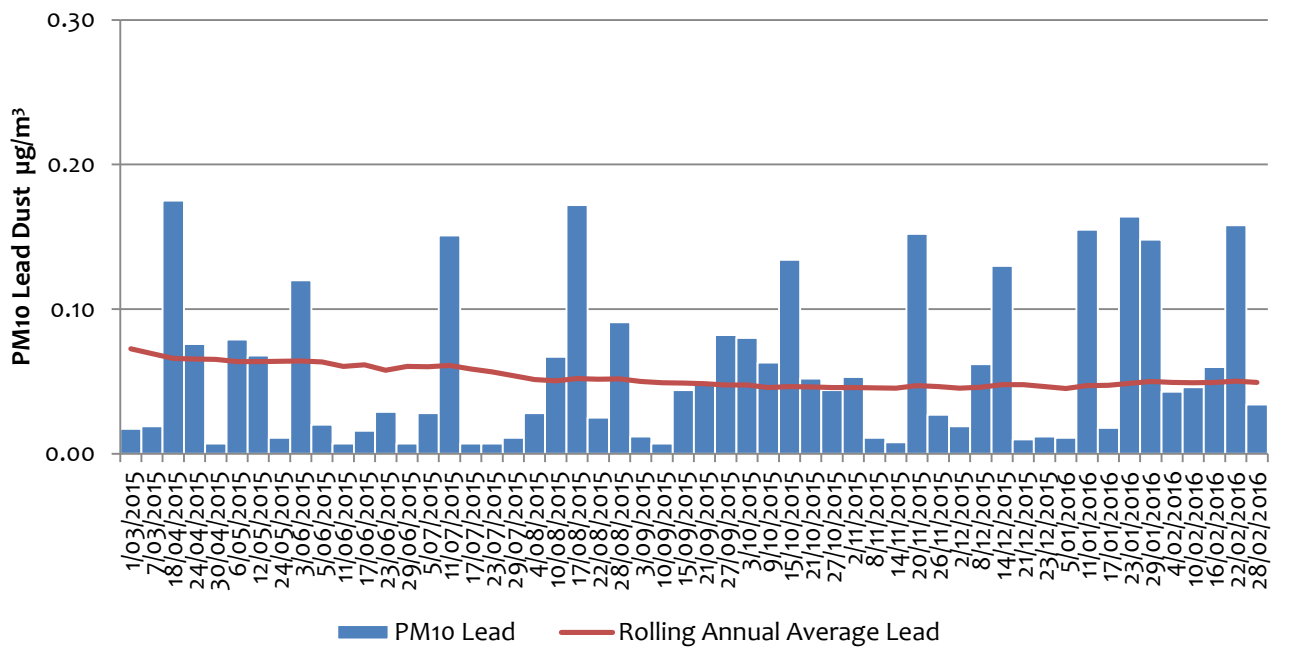
EPL11 - Silver Tank - On Site

DATE	PM10 (µg/m ³)	Lead (µg/m ³)
4/02/2016	18.90	0.04
10/02/2016	16.50	0.05
16/02/2016	11.50	0.06
22/02/2016	25.70	0.16
28/02/2016	18.80	0.03

PM10

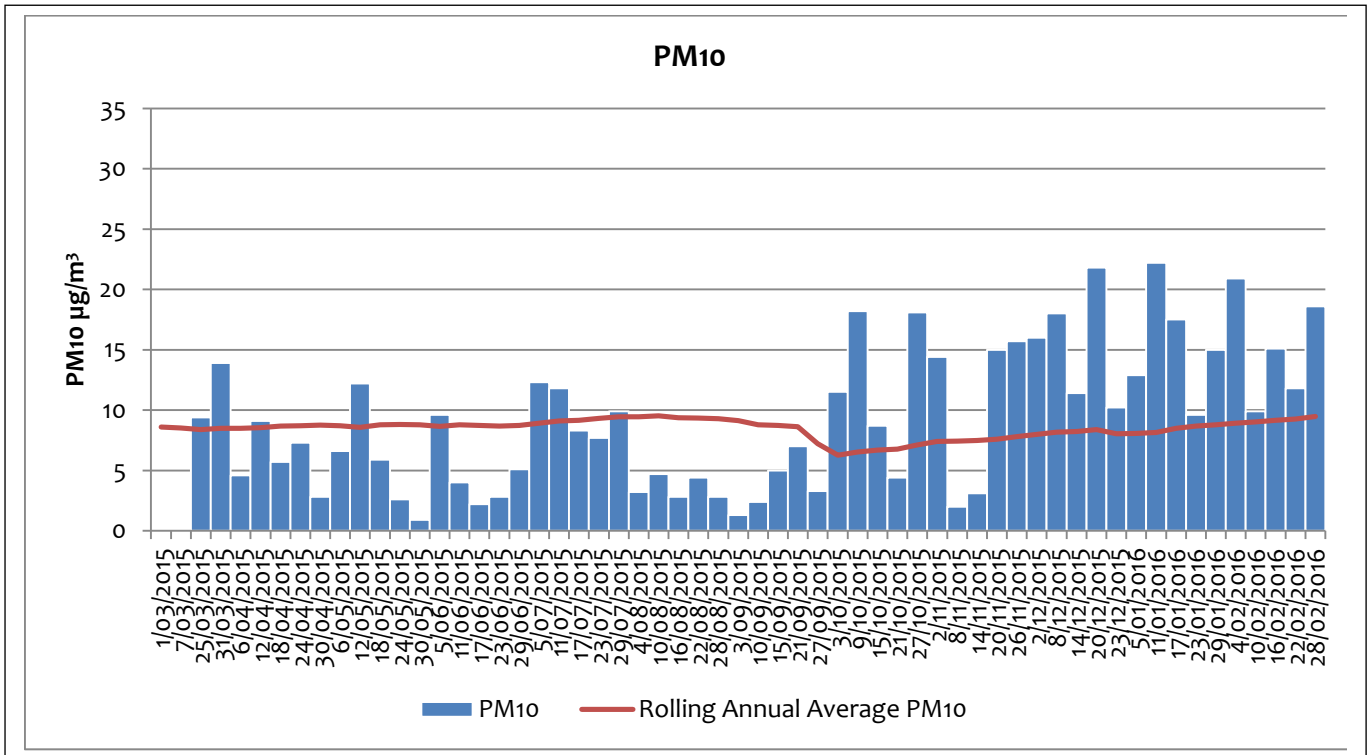


PM10 Lead

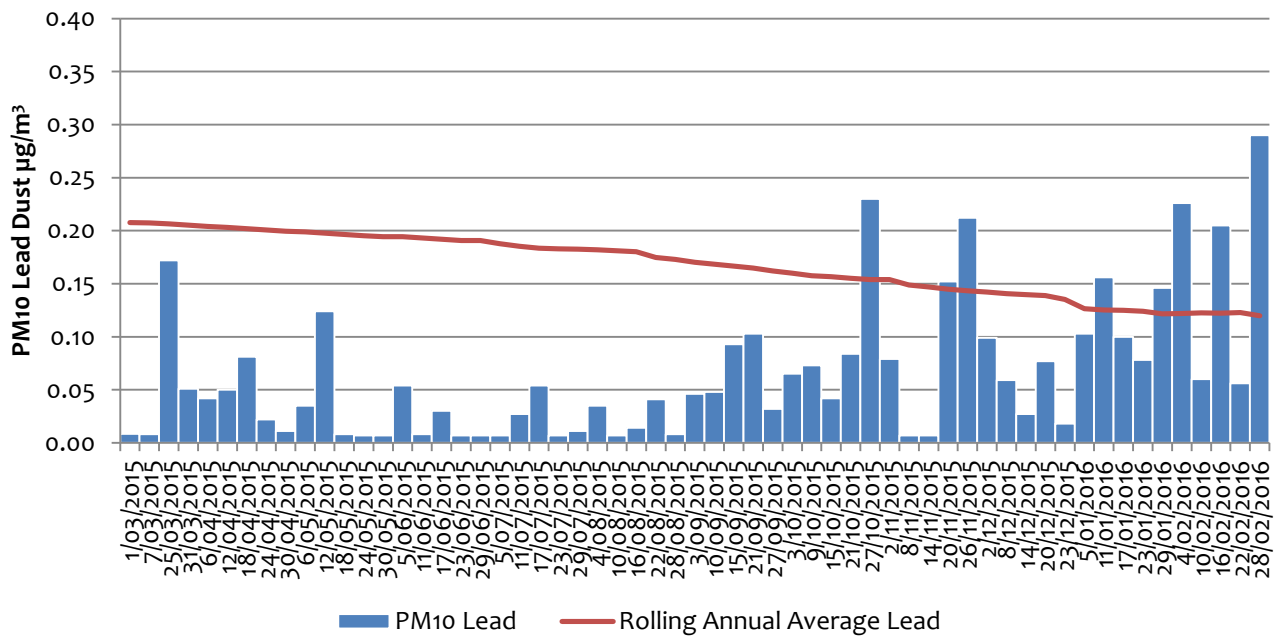


EPL12 - Blackwoods Pit – On Site

DATE	PM10 ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
4/02/2016	20.90	0.23
10/02/2016	9.90	0.06
16/02/2016	15.10	0.21
22/02/2016	11.80	0.06
28/02/2016	18.60	0.29



PM10 Lead

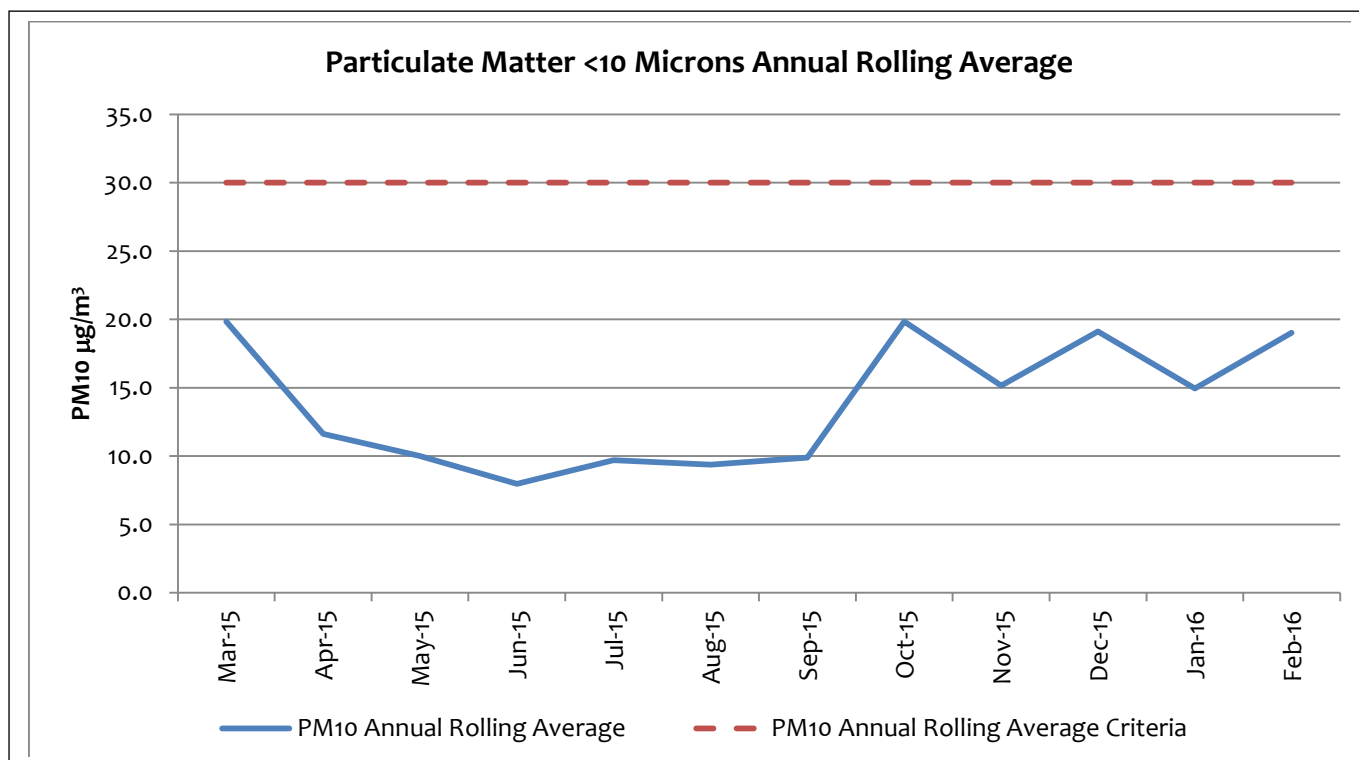
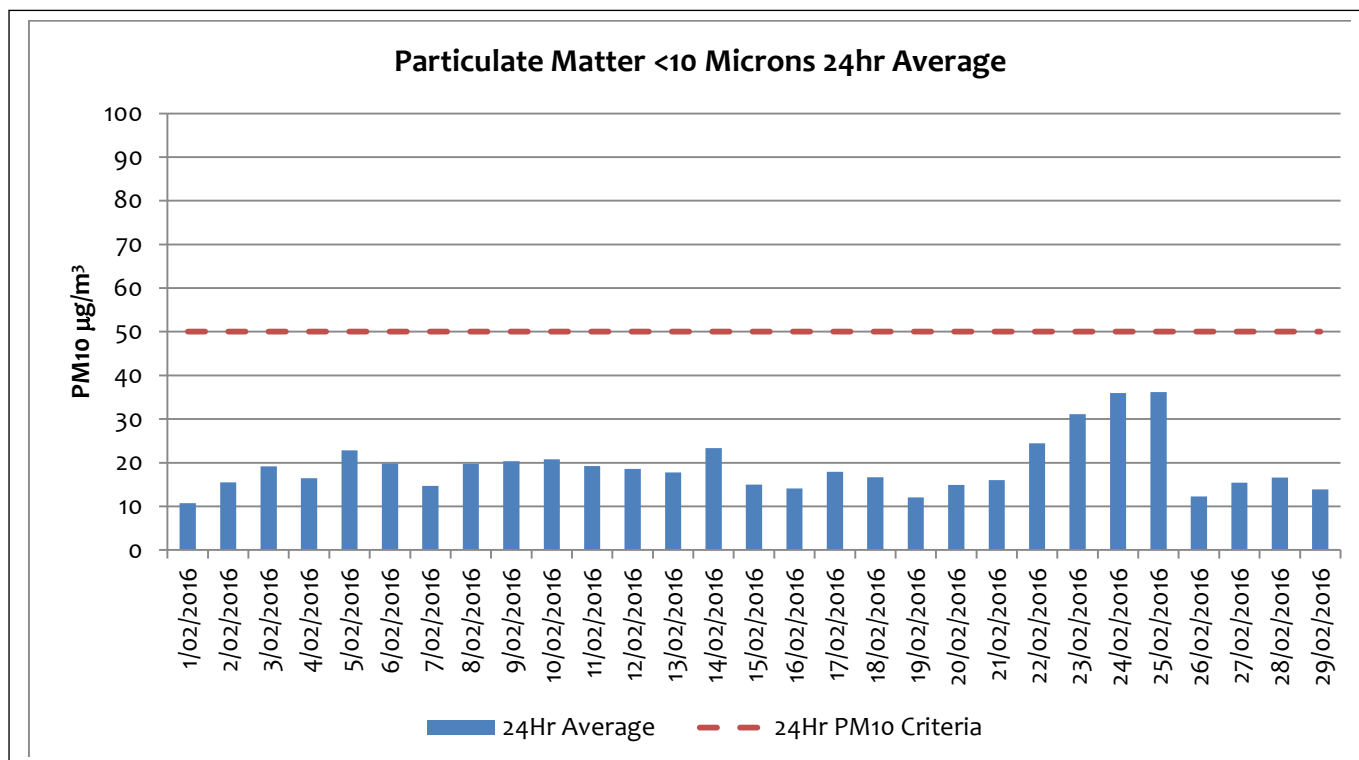


1.2 Tapered Element Oscillating Microbalance Sampling (TEOM)

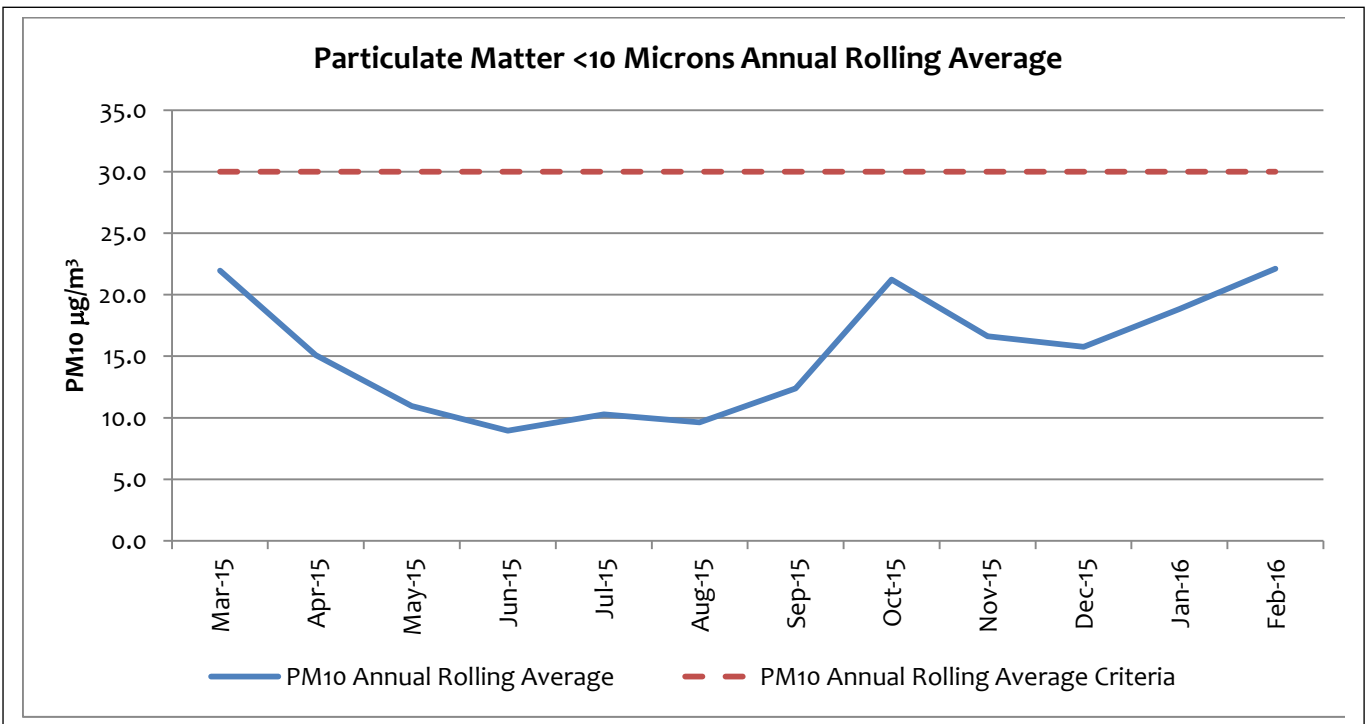
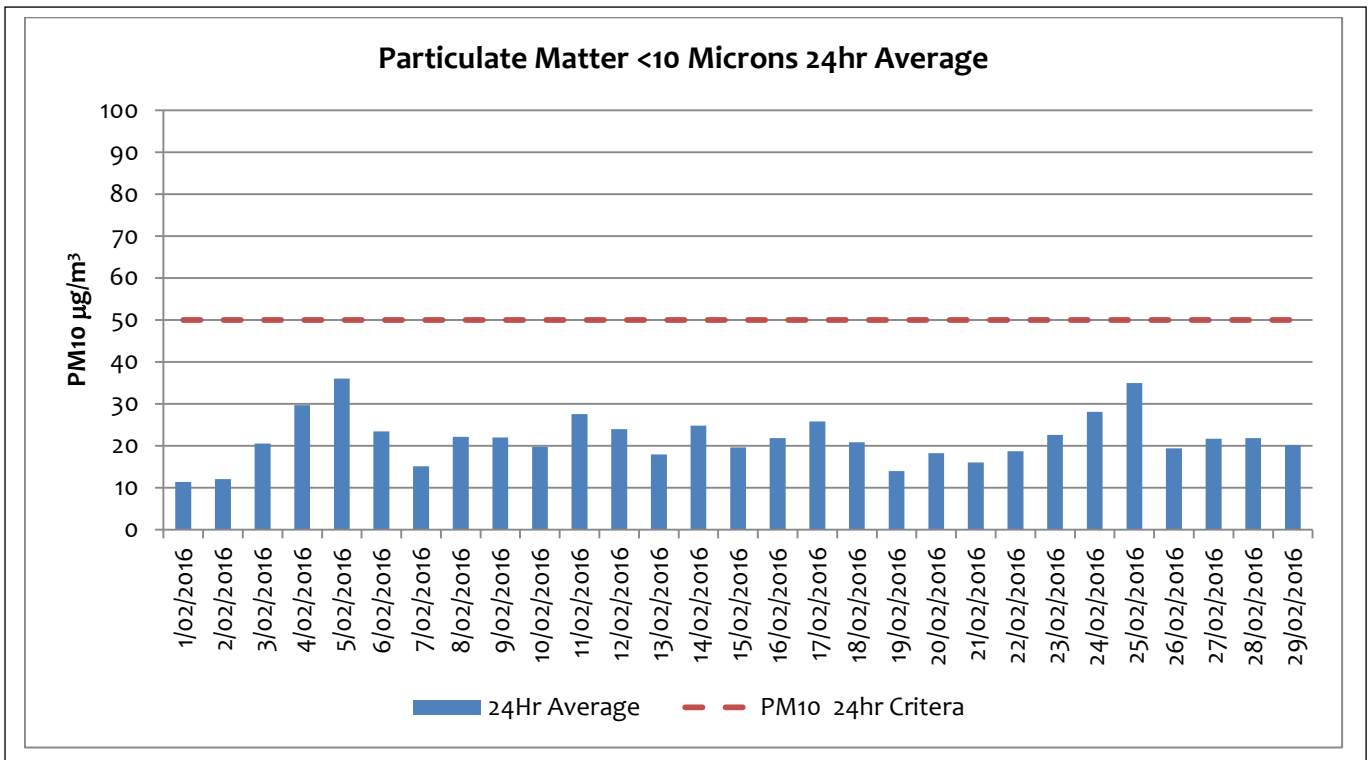
Particulate Matter <10 Microns 24Hr Average		
Date	TEOM 1 - EPL 13 ($\mu\text{g}/\text{m}^3$) Essential Water – Off Site	TEOM 2 – EPL 14 ($\mu\text{g}/\text{m}^3$) Blackwoods Pit – On Site
1/02/16	10.76	11.39
2/02/16	15.51	12.12
3/02/16	19.19	20.55
4/02/16	16.48	29.74
5/02/16	22.84	36.00
6/02/16	19.80	23.46
7/02/16	14.72	15.11
8/02/16	19.77	22.12
9/02/16	20.33	21.98
10/02/16	20.77	19.79
11/02/16	19.20	27.56
12/02/16	18.59	24.00
13/02/16	17.77	17.96
14/02/16	23.33	24.84
15/02/16	14.99	19.65
16/02/16	14.12	21.87
17/02/16	17.93	25.80
18/02/16	16.66	20.83
19/02/16	12.05	13.97
20/02/16	14.93	18.24
21/02/16	16.01	16.04
22/02/16	24.46	18.74
23/02/16	31.14	22.62
24/02/16	35.94	28.12
25/02/16	36.14	35.00
26/02/16	12.25	19.41
27/02/16	15.42	21.72
28/02/16	16.60	21.84
29/02/16	13.90	20.19

PM10 $\mu\text{g}/\text{m}^3$ 12 Month Rolling Average												
	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16
TEOM 1 EPL13 Essential Water Off Site	19.8	11.6	10.0	8.0	9.7	9.4	9.9	19.8	15.2	19.1	15.0	19.0
TEOM 2 EPL14 Blackwoods Pit On Site	22.0	15.1	10.9	9.0	10.3	9.6	12.4	21.2	16.6	15.8	18.8	22.1

EPL13 – Essential Water – Off Site

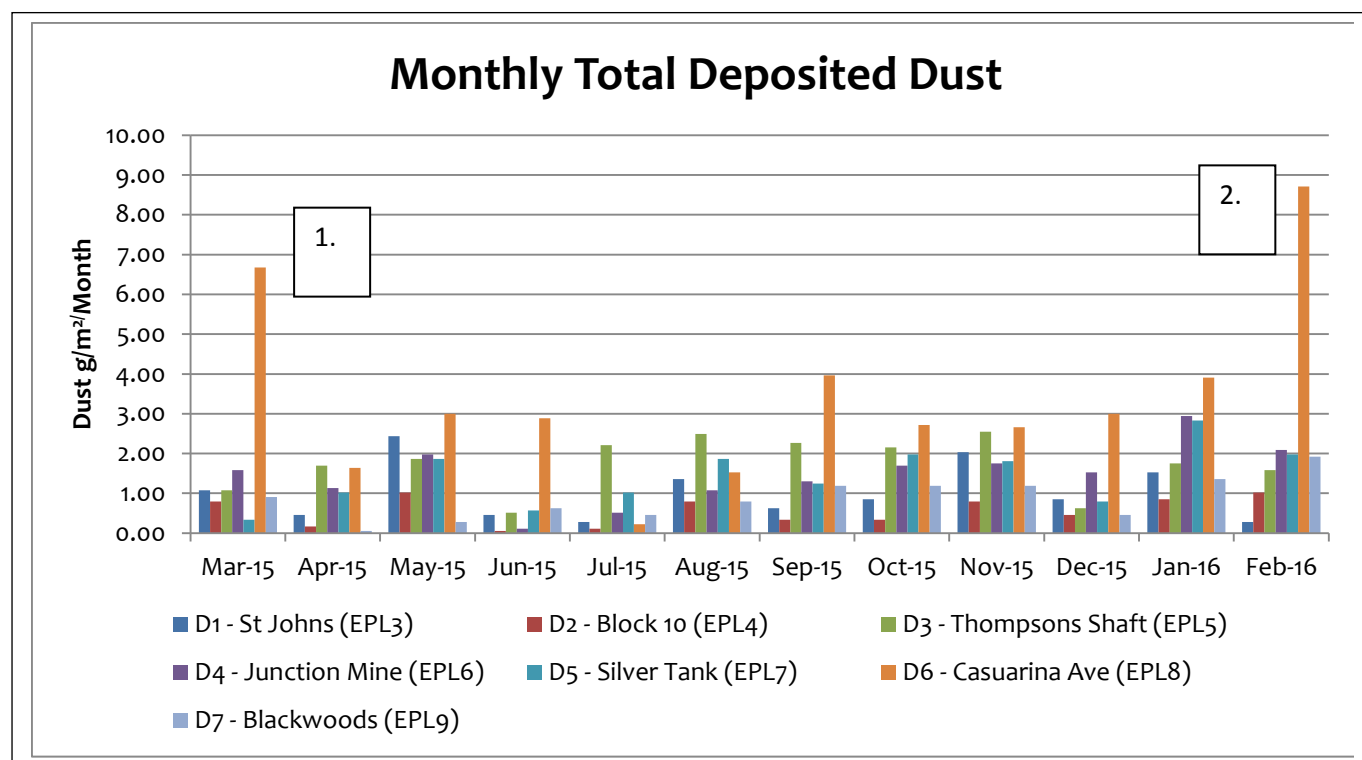


EPL14 – Blackwoods Pit – On Site



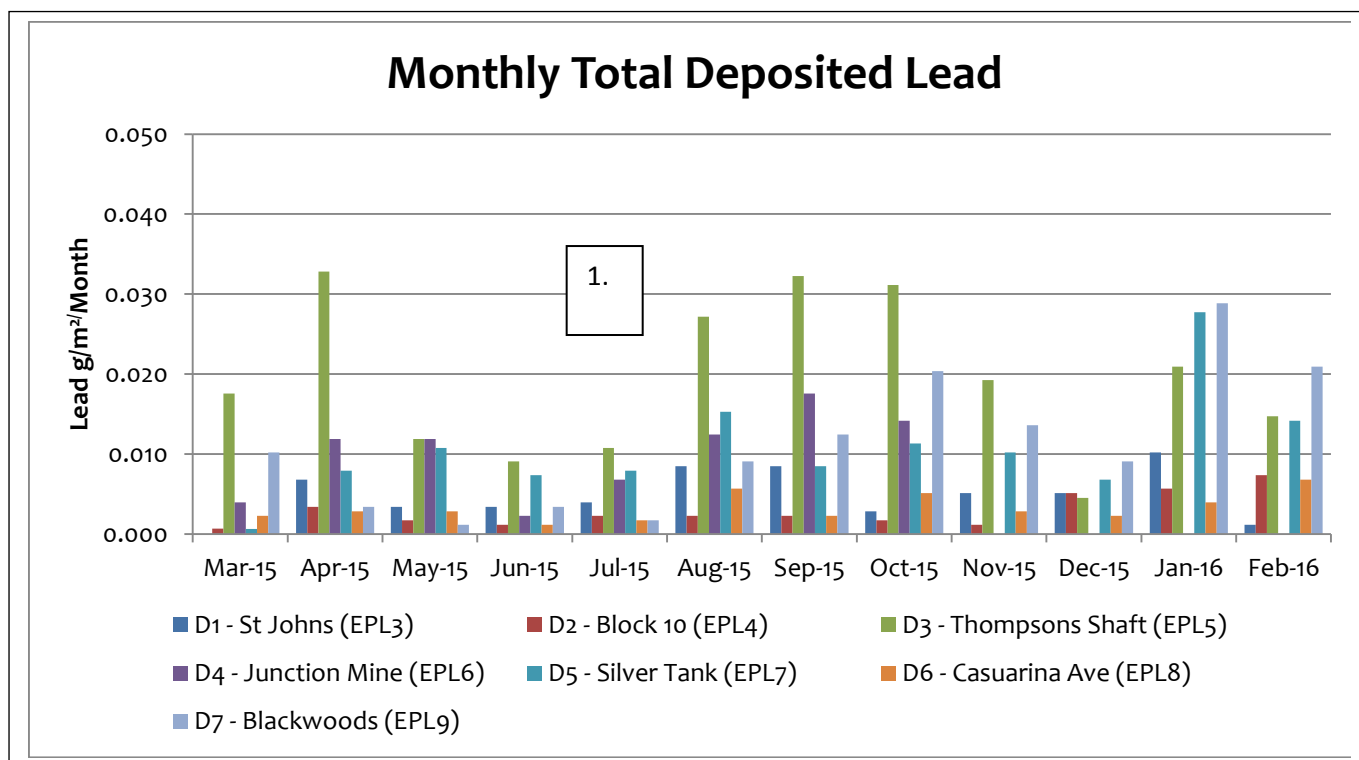
1.3 Dust Deposition Sampling

Total Deposited Dust (g/m ² /Month)							
Date	D1 (off site)	D2	D3	D4	D5	D6 (off site)	D7
Feb 2016	0.28	1.02	1.58	2.09	1.98	8.71	1.92
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 March 2015. This sample had a large volume of water present when collected.
2. When the sample was picked up the sample stand had been relocated within the back yard of the residence. The resident was asked to move the stand back to its original location. Contamination from a nearby greenhouse is suspected.

Total Deposited Lead (g/m ² /Month)							
Date	D1 (Off Site)	D2	D3	D4	D5	D6 (Off Site)	D7
Feb 2016	0.001	0.007	0.015	0.000	0.014	0.007	0.021
Background Average	0.0000	0.001	0.0018	0.0040	0.0010	0.0020	0.0100



1. Samples at Thompson's shaft spiked in lead concentration in April, August and September. Nearby vegetation and buildings have been identified as potential sources. Nearby vegetation was removed in September and October. A clean up of the haul road adjacent Thompsons shaft was carried out in September. The haul road will continue to be monitored. Further investigation is required with regard to nearby buildings, it is suspected the paint on the buildings contains lead and is in poor condition. There is also exposed remnant ore body at the surface in this location which may also contribute as a slightly higher than background influence. The dust bottle location was moved approximately 10m away from the buildings and has delivered a lower total deposited lead reading for December however levels are slightly higher again in January. Notably Silver Tank and Blackwood's were higher than normal. Essential Water were performing earth works near the western boundary of the site during January which may have contributed in some way. Additionally some lead containers were cleaned during January at the rail load out. This not an activity normally conducted on site and involves breaking up of consolidated concentrate in the bottom of the lead containers. This has probably contributed to both the higher levels at Blackwoods and Thompson's shaft.

2 Blasting (Vibration and Overpressure)

Note: *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 2016, therefore no calculation on percentage of blasts over 5mm/sec can be given (it is based on an annual calculation).

February Summary Block 7, Zinc Lode:

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

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

- 8 production firings
- 111 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 115dBL
- 0 Blasts recorded an over pressure above 120dBL

12 Month Summary Rest of Mine, Western Mineralisation and Main Lode:

- % of all blasts over 5mm/sec = **0.39%** (licence requirement <5%) calculated from 1st March 2015 until February 29, 2016.

3 Noise

Quarterly noise monitoring is now complete as per the Pollution Reduction Program (PRP) on EPL 12559. Four noise assessments have been undertaken since November 2014. EMGA Mitchell McLennan Pty Limited (EMM) completed the analysis for all assessments.

A final summary report was produced by EMM for submission to the EPA. A licence variation was been sought from the EPA and the PRP was removed from the licence on 18/3/2016.

Future noise monitoring will be undertaken as per the NSW Industrial Noise Policy.

4.2 Surface Water

Insufficient rainfall for opportunistic surface water sampling during December 2015

Surface Water Table Nov 2015 to Nov 2016

EPA Identification Number	Frequency	Comment
EPL29	2 x Per year when contains water	No sample - dry
EPL30	2 x Per year when contains water	No sample - dry
EPL31	2 x Per year when contains water	No sample - dry
EPL32	2 x Per year when contains water	No sample - dry
EPL33 Horwood Dam	2 x Per year when contains water	No sample – low water
EPL34 Upstream	2 x Per year when contains water	No sample - dry
EPL35 Downstream	2 x Per year when contains water	No sample - dry

5 Weather Data

BHOP – Automatic Weather Station was unavailable for June. The new weather station was installed on June 15. The weather station continuously monitors the following parameters as per point 55 of the Environmental Protection Licence.

POINT 55

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Temperature at 10 metres	AM-4	degrees Celsius	15 minutes	Continuous
Wind Direction at 10 metres	AM-4	Degrees in a clockwise direction from True North	15 minutes	Continuous
Wind Speed at 10 metres	AM-4	metres per second	15 minutes	Continuous
Rainfall	AM-4	millimetres	1 hour	Continuous
Sigma theta	AM-2 & AM-4	Degrees	15 minutes	Continuous

The continuous data can be viewed at any time at the following web site using the username and password.

www.loggermonitor.com/login

user: CBHAdmin

pass: brokenhill

Summary reports for all licence parameters are available from the website however due to the 15 minute data being very large daily summary data was also obtained from the Bureau of Meteorology Broken Hill on the following page:

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am					3 pm						
		Min	Max				Dir	Spd	Time	Temp	RH	Clid	Dir	Spd	MSLP	Temp	RH	Clid	Dir	Spd	MSLP
		°C	°C					km/h	local	°C	%	g th		km/h	hPa	°C	%	g th		km/h	hPa
1	Mo						SW	43	14:13				NNE	4	1006.7				WSW	28	1003.7
2	Tu						NNE	61	07:59				NNE	39	1001.4				NW	37	998.7
3	We						SSW	69	07:37				SSW	46	1007.9				SSW	41	1008.7
4	Th						S	57	14:53				S	39	1014.2				S	33	1011.1
5	Fr						SE	63	12:03				SE	30	1013.1				SE	33	1010.2
6	Sa						SE	39	12:40				E	26	1012.6				ESE	24	1010.1
7	Su						S	50	15:21				SSW	15	1014.8				SE	22	1012.9
8	Mo						SSE	50	16:47				SSW	26	1018.3				S	26	1015.3
9	Tu						ESE	35	14:07				S	22	1017.2				SSE	20	1013.7
10	We						SSW	41	13:19				N	9	1013.0				SW	24	1009.5
11	Th						S	39	10:31				S	20	1011.6				E	13	1008.8
12	Fr						S	35	17:42				SSW	20	1012.9				ESE	9	1009.3
13	Sa						S	48	21:42				SSW	11	1010.9				SSW	22	1007.9
14	Su						S	48	00:28				SSE	26	1012.9				S	33	1010.2
15	Mo						SW	43	14:01				S	26	1014.7				SW	22	1011.9
16	Tu						S	70	13:54				SSW	31	1016.2				SSW	31	1013.9
17	We						SSW	52	15:45				SSE	26	1016.5				S	26	1012.8
18	Th						SSW	33	13:40				S	19	1012.2				W	11	1008.9
19	Fr						SSE	41	21:49				S	19	1012.7				NW	20	1010.4
20	Sa						SSE	44	09:30				SSE	31	1019.0				SE	20	1017.3
21	Su						E	39	08:21				E	24	1020.7				E	9	1017.1
22	Mo						N	43	11:01				NE	26	1018.6				N	17	1015.8
23	Tu						N	48	08:21				N	26	1014.8				N	17	1011.6
24	We						NNW	56	14:58				NNW	9	1010.2				NNW	33	1006.8
25	Th						SSW	52	20:01				S	20	1012.3				SW	17	1011.3
26	Fr						S	50	01:53				S	33	1019.1				SSW	26	1016.5
27	Sa						SSE	41	11:03				S	28	1019.9				SSE	24	1016.4
28	Su						SSE	54	12:59				S	30	1019.0				SSE	30	1016.0
29	Mo						SSE	39	10:52				S	24	1019.0				SSE	22	1015.7
Statistics for February 2016																					
Mean														24	1014.2					23	1011.5
Lowest													NNE	4	1001.4				#	9	998.7
Highest							S	70					SSW	46	1020.7				SSW	41	1017.3
Total																					

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	2/3/2016	1/3/2016	24/3/2016
TEOM	Real time	-	24/3/2016
Dust Deposition	11/3/2016	18/3/2016	24/3/2016
Water	11/2/2016 & 25/2/2016	17/2/2016 & 2/3/2016	24/3/2016
Blast Vibration and overpressure	Real Time	-	24/3/2016

7 Correction Log January 2016

There are no data corrections for January 2016.

8 Attachments

Field monitoring data and notes for February groundwater sampling

Enter

Temp

Peizo	date	depth	cond	TDS	pH	ORP mV	
GW01	10/2/16	7.90	10602	7384	5.10	226.1	
GW02	"	DRY					
GW03	"	3.70	17548	10972	6.87	171.1 95.9	27.1
GW04	"	2.96	8697 15990	5544 10535	7.01 6.80	92.5 85.2	
GW05	"	3.72	18393	11888	6.31	144.5 95.7	
GW06	"	2.90	14977	9776	6.74	242.5	25.7
GW07	"	2.78	14737	9365	6.39	225.8	
GW08	10/2/16	2.17	11826	7650	5.67	286.7	25.3
GW09	"		12743	7858	7.28	229.7	27.8
GW10	"	1.86	15846	9769	6.69	240.2	29.4
GW11	"	10.27	4980	3432	7.02	81.9	
GW12	"	36.46	14487	9841	5.97	278.1	22.8
GW13	"	DRY					
GW14	"	DRY					
GW15	"	DRY					
GW16	"	DRY					
Horwoods	"	—	19911 12824	12831	6.62	200.2	25.2
Shaft 7	10/2/16	—	13591	8723	6.20	271	25.7
UG Feed	"	No	water	not	pumping	mg	