

Monthly Environmental Data April 2016

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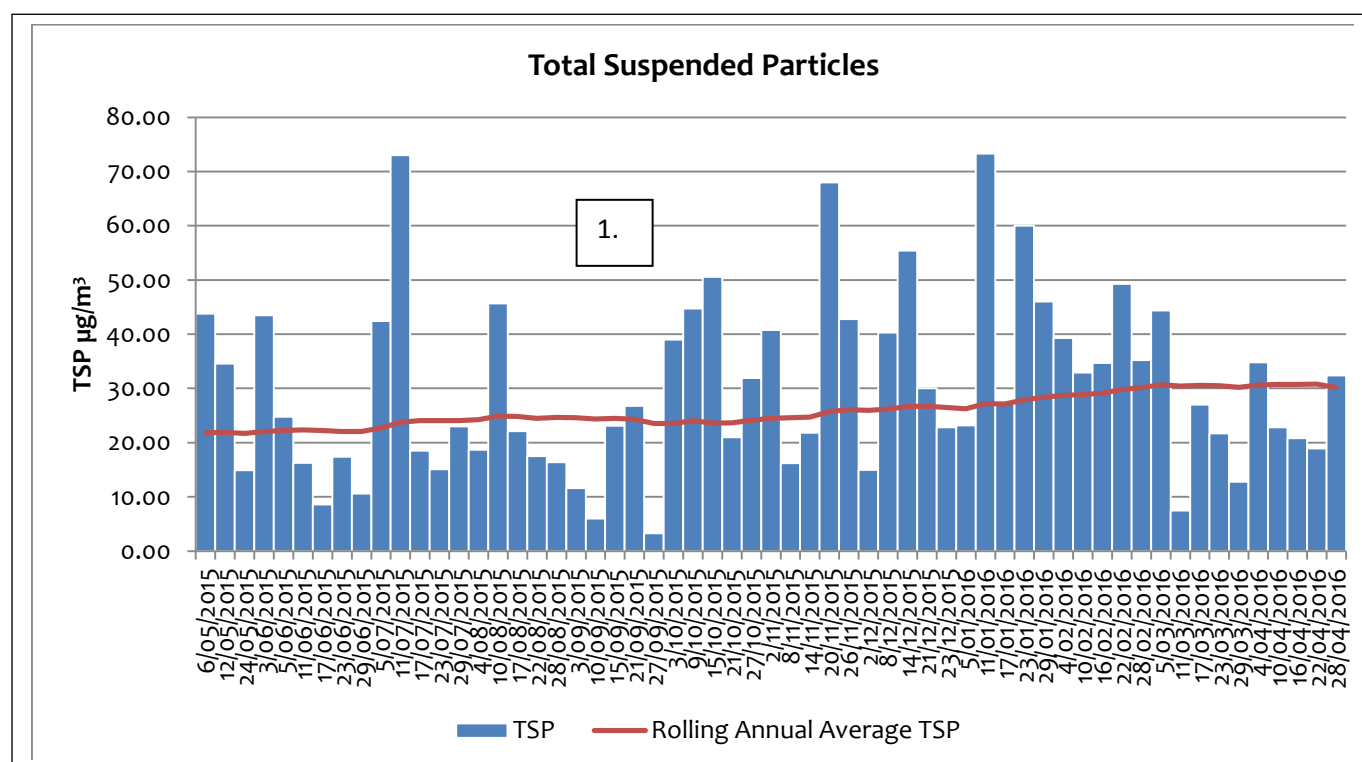
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1 Air Quality

1.1 High Volume Air Samplers

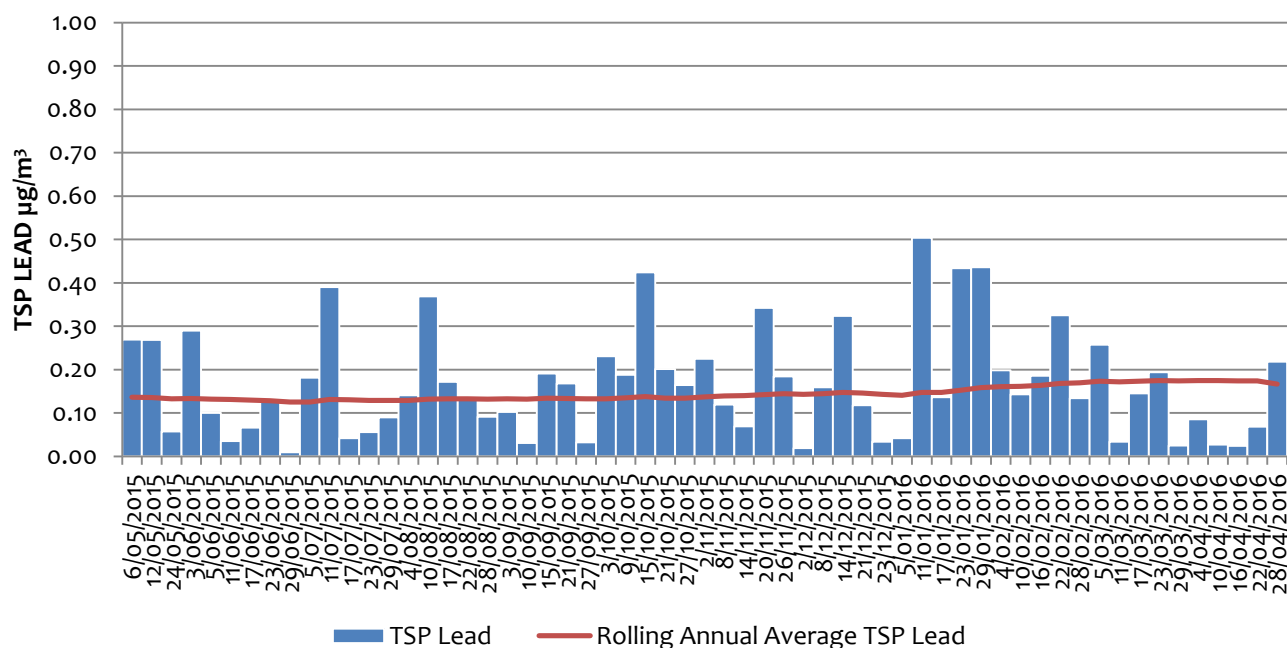
EPL10 - SILVER TANK - ON SITE

DATE	TSP ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
4/04/2016	34.80	0.09
10/04/2016	22.80	0.03
16/04/2016	20.80	0.02
22/04/2016	18.90	0.07
28/04/2016	32.40	0.22



1. 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.

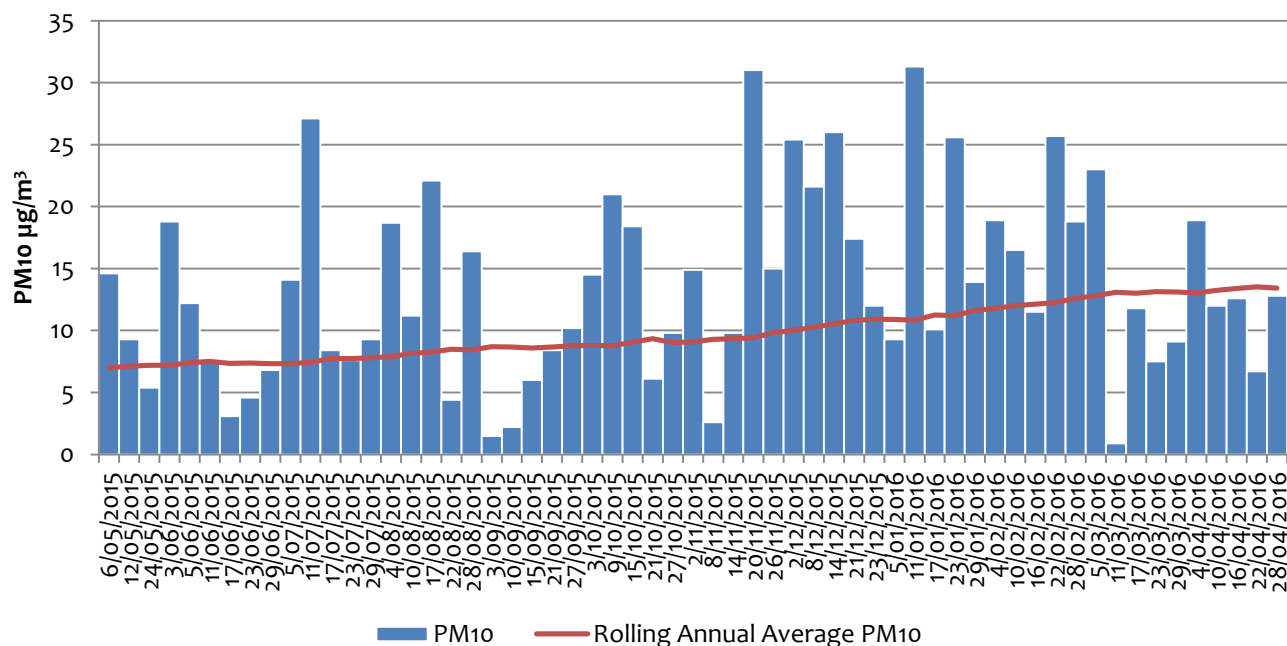
Total Suspended Particles - Lead

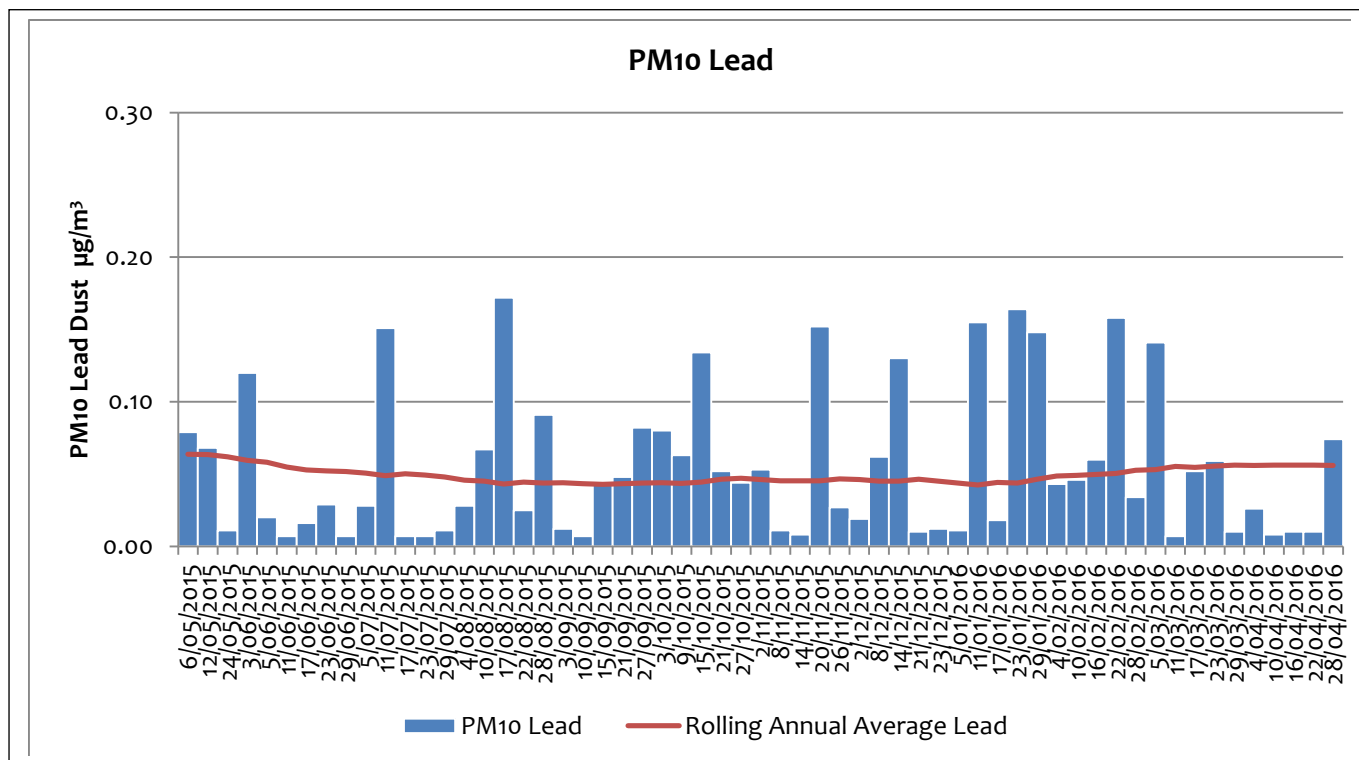


EPL11 - Silver Tank - On Site

DATE	PM10 (µg/m³)	Lead (µg/m³)
4/04/2016	18.90	0.03
10/04/2016	12.00	0.01
16/04/2016	12.60	0.01
22/04/2016	6.70	0.01
28/04/2016	12.80	0.07

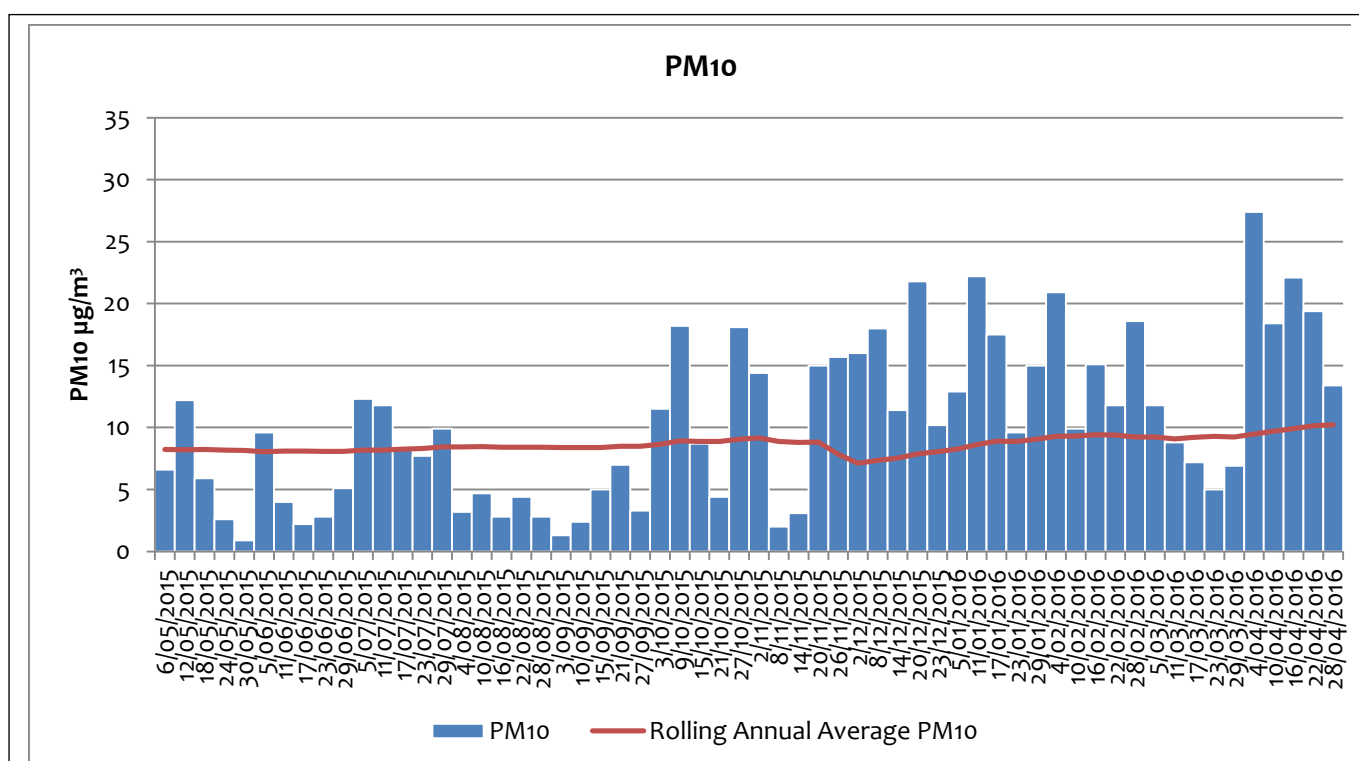
PM10



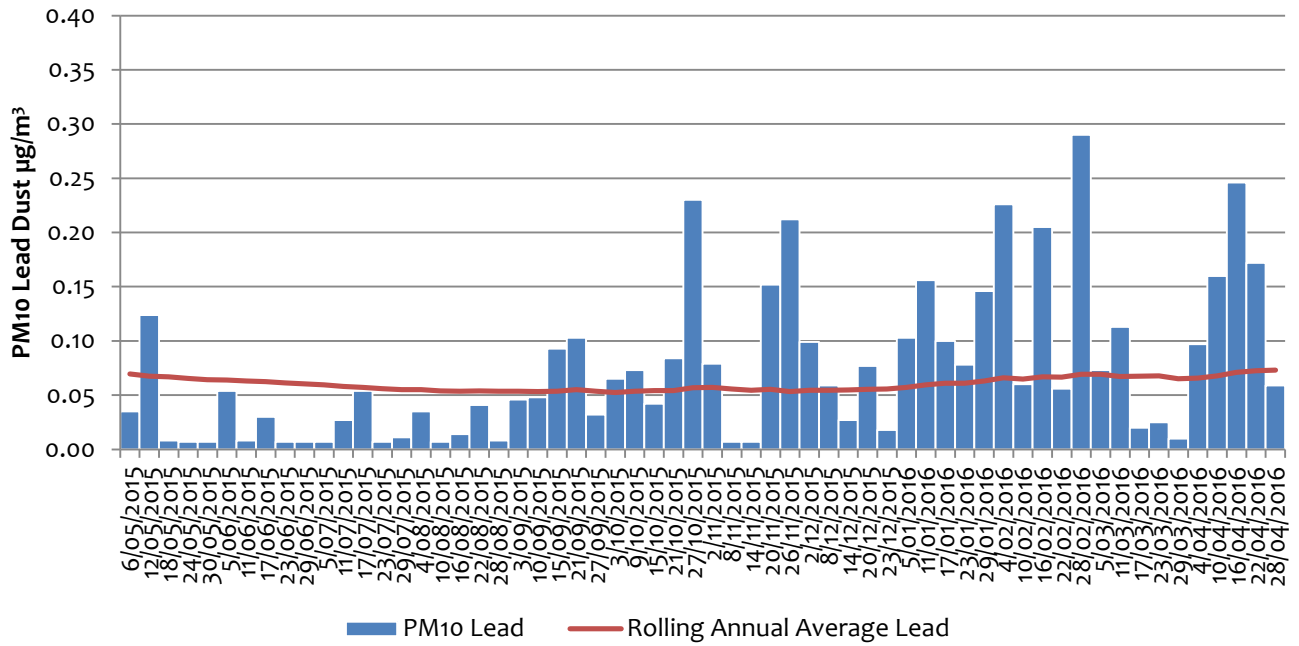


EPL12 - Blackwoods Pit – On Site

DATE	PM10 ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
4/04/2016	27.40	0.10
10/04/2016	18.40	0.16
16/04/2016	22.10	0.25
22/04/2016	19.40	0.17
28/04/2016	13.40	0.06



PM10 Lead

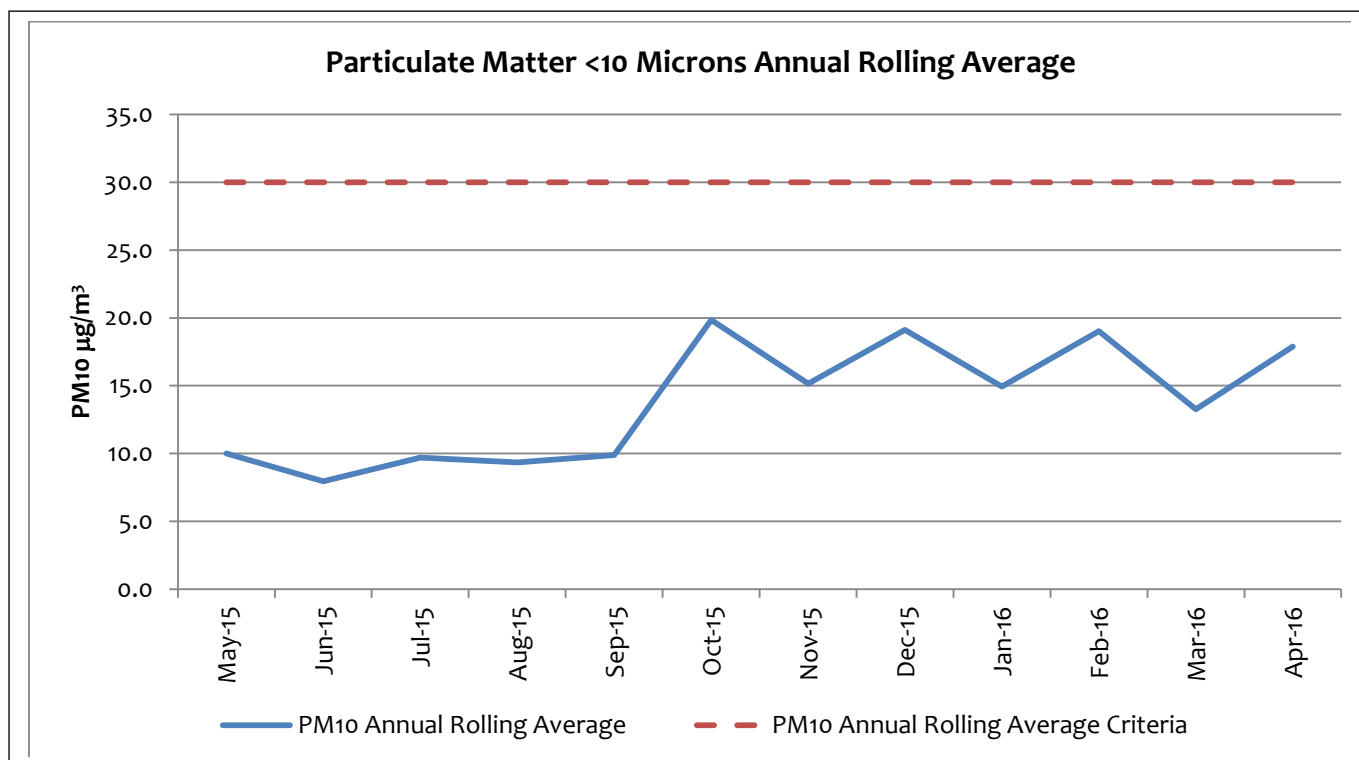
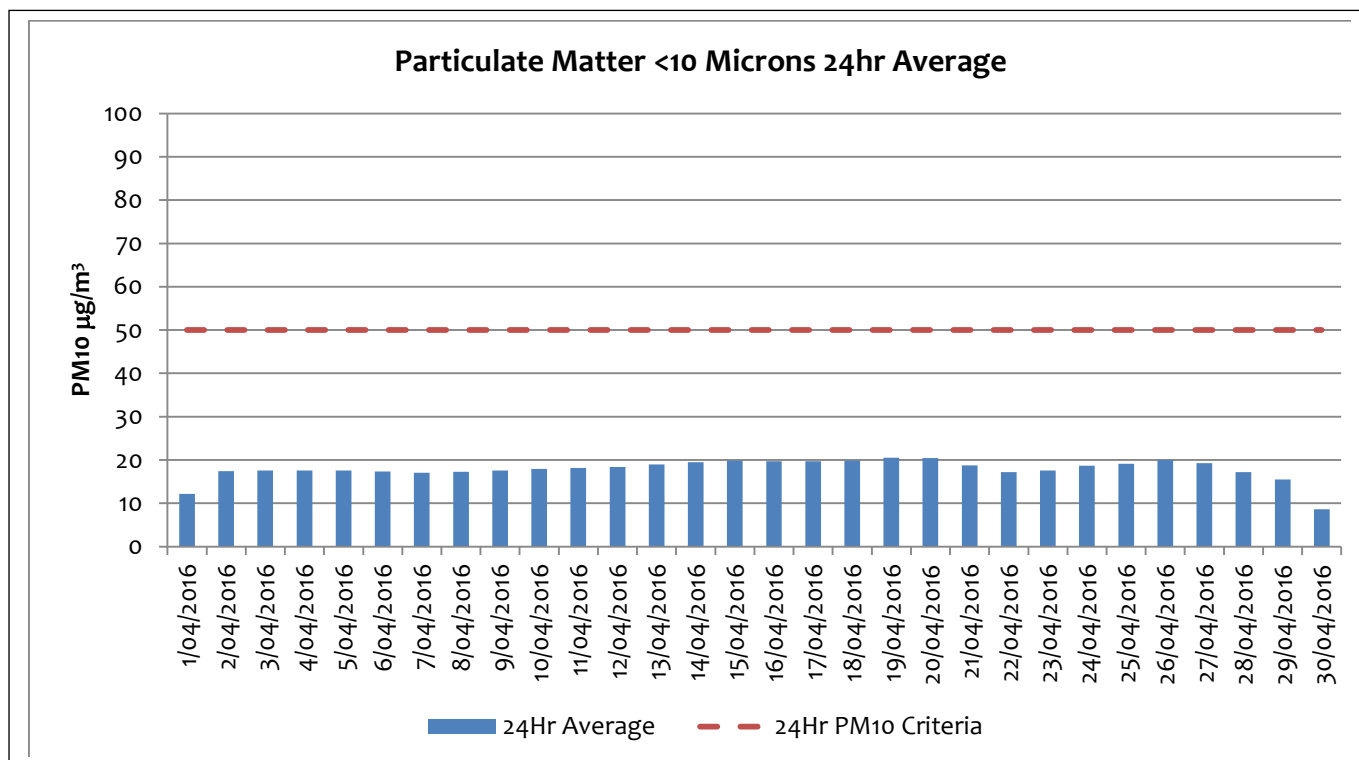


1.2 Tapered Element Oscillating Microbalance Sampling (TEOM)

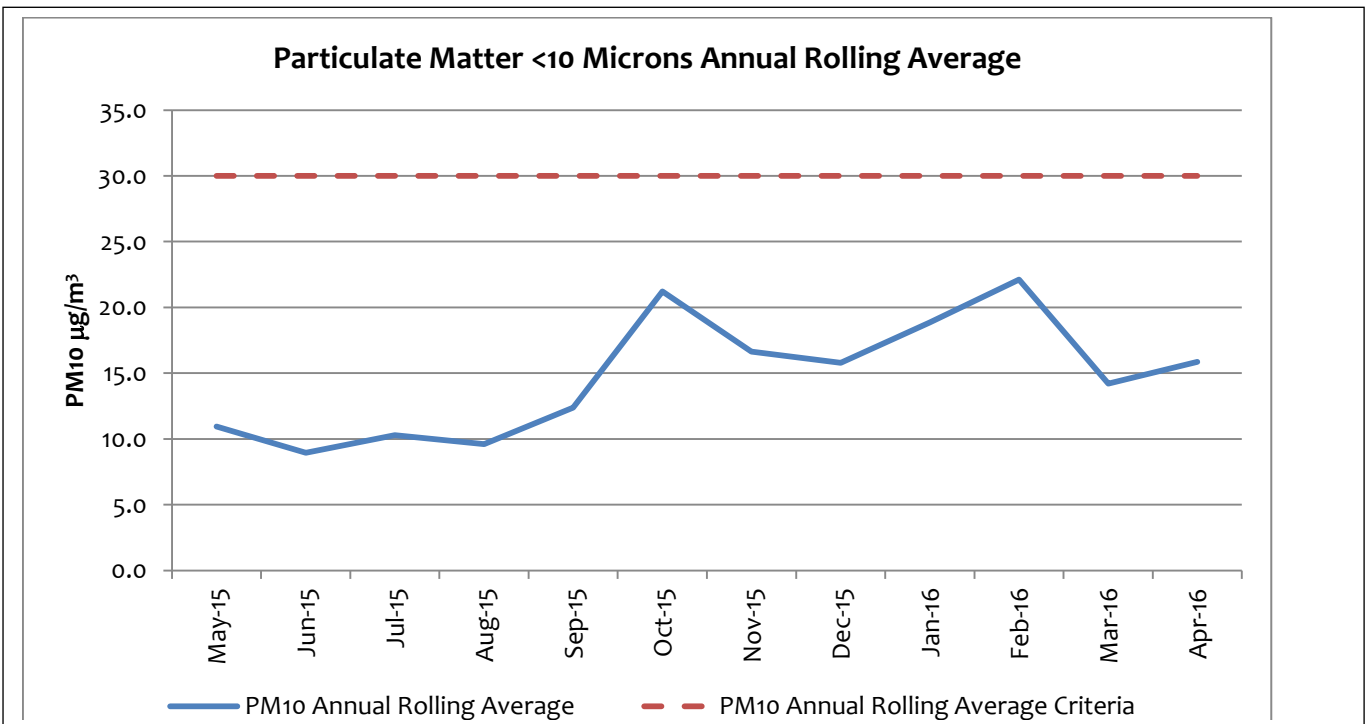
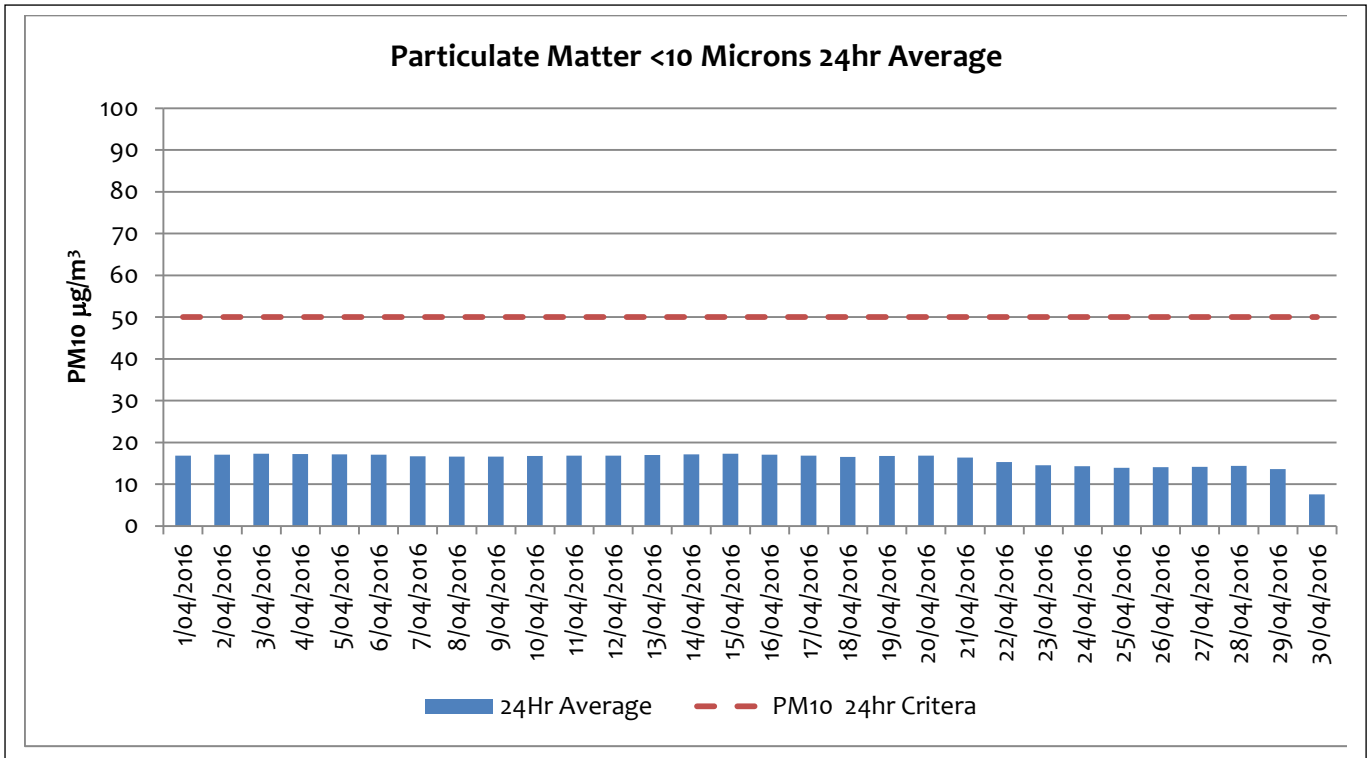
Particulate Matter <10 Microns 24Hr Average		
Date	TEOM 1 - EPL 13 ($\mu\text{g}/\text{m}^3$) Essential Water – Off Site	TEOM 2 – EPL 14 ($\mu\text{g}/\text{m}^3$) Blackwoods Pit – On Site
1/04/16	12.16	16.81
2/04/16	17.39	17.03
3/04/16	17.58	17.26
4/04/16	17.59	17.25
5/04/16	17.55	17.18
6/04/16	17.33	17.09
7/04/16	17.04	16.71
8/04/16	17.30	16.64
9/04/16	17.55	16.61
10/04/16	17.92	16.77
11/04/16	18.14	16.84
12/04/16	18.39	16.81
13/04/16	18.94	16.96
14/04/16	19.52	17.18
15/04/16	19.85	17.30
16/04/16	19.72	17.10
17/04/16	19.72	16.82
18/04/16	19.82	16.50
19/04/16	20.53	16.76
20/04/16	20.44	16.85
21/04/16	18.76	16.36
22/04/16	17.16	15.27
23/04/16	17.53	14.57
24/04/16	18.71	14.30
25/04/16	19.15	13.93
26/04/16	20.00	14.05
27/04/16	19.28	14.17
28/04/16	17.19	14.35
29/04/16	15.53	13.64
30/04/16	8.61	7.53

PM10 $\mu\text{g}/\text{m}^3$ 12 Month Rolling Average												
	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16
TEOM 1 EPL13 Essential Water Off Site	10.0	8.0	9.7	9.4	9.9	19.8	15.2	19.1	15.0	19.0	13.3	17.9
TEOM 2 EPL14 Blackwoods Pit On Site	10.9	9.0	10.3	9.6	12.4	21.2	16.6	15.8	18.8	22.1	14.2	15.9

EPL13 – Essential Water – Off Site (TEOM1)

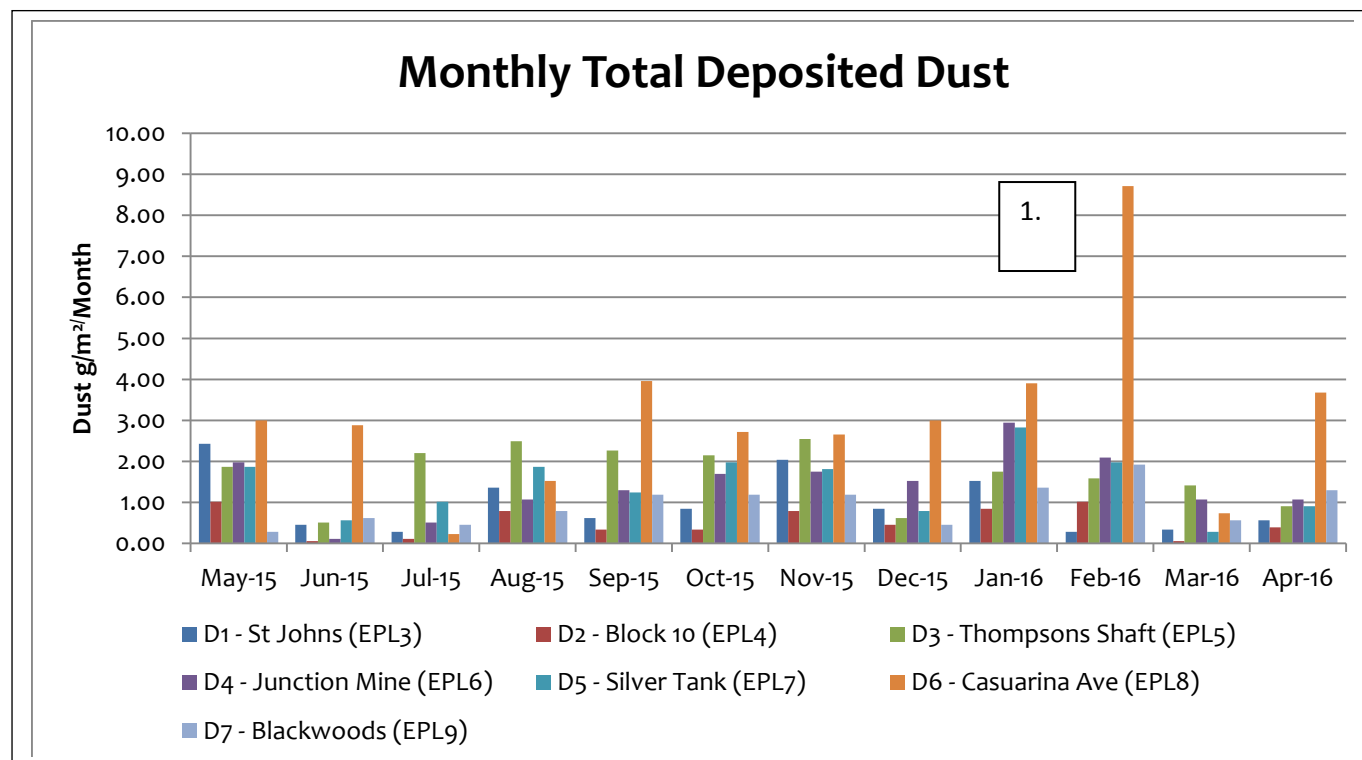


EPL14 – Blackwoods Pit – On Site (TEOM2)



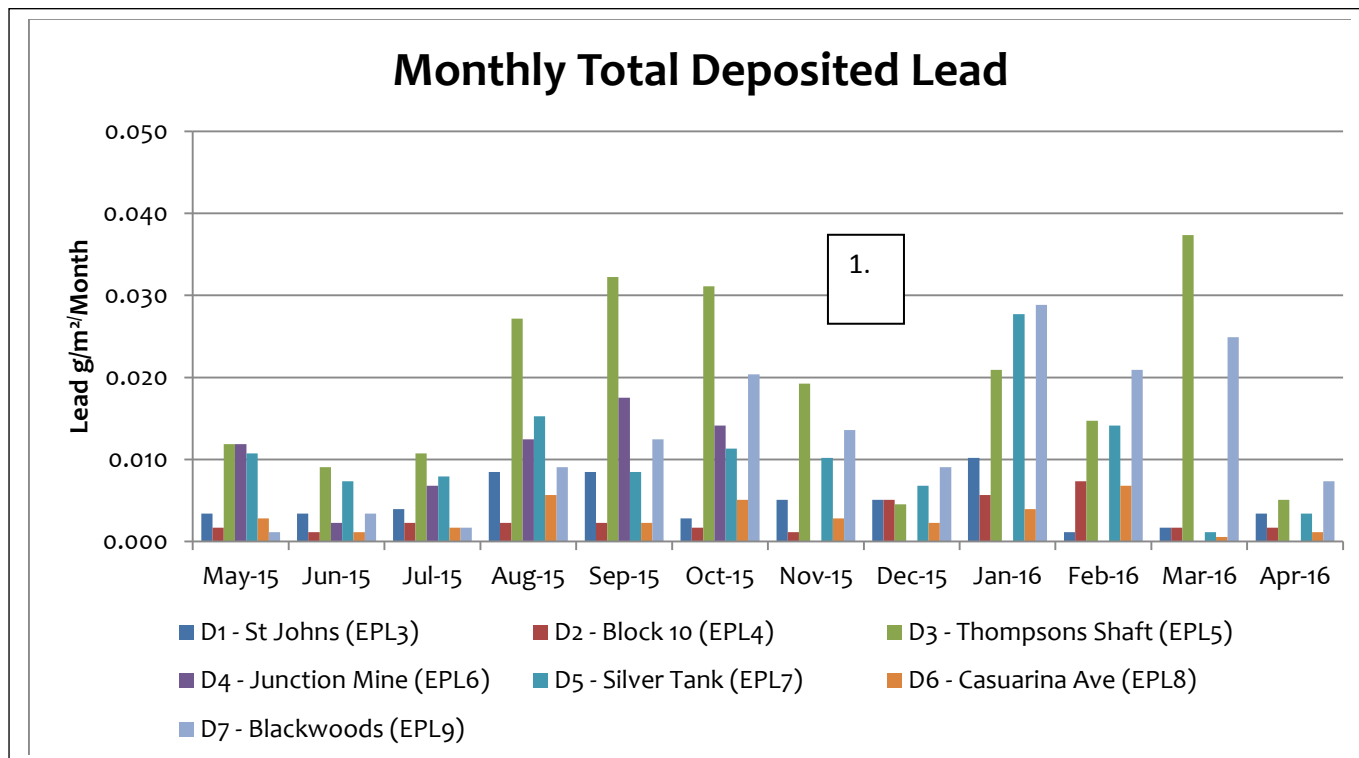
1.3 Dust Deposition Sampling

Total Deposited Dust (g/m ² /Month)							
Date	D1 (off site)	D2	D3	D4	D5	D6 (off site)	D7
April 2016	0.57	0.40	0.91	1.08	0.91	3.68	1.30
Background Average	4.0	3.1	4.3	5.7	n/a	5.8	n/a



1. When the sample for February was collected 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
April 2016	0.003	0.002	0.005	0.000	0.003	0.001	0.007
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 August, September, October and again in March. 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 also 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. 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 shipping containers were cleaned during January at the rail load out. The latest monthly result is the lowest on record for the last 12 months.

2 Blasting (Vibration and Overpressure)

Note: *Vibration is recorded in Peak Particle Velocity (ppv), Overpressure is recorded in Decibels (dBL)*

March Summary Block 7, Zinc Lode:

- 4 production firings
- 25 development firings
- 4 Blasts 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

12 Month Summary of Zinc Lode:

- % of all blasts over 3mm/sec = **2.6%** (licence requirement <5%) calculated from 1st May 2015 until 30th April, 2016.

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

- 10 production firings
- 139 development firings
- 1 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 = **0.27%** (licence requirement <5%) calculated from 1st April 2015 until 30th April, 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 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. A single noise assessment will be conducted during 2016.

4 Water

4.1 Ground Water Sampled 5/04/2016

		UG FEED	SHAFT 7
pH Value	pH Unit	6.53	6.74
Electrical Conductivity @ 25°C	µS/cm	9730	12200
Total Dissolved Solids @180°C	mg/L	10000	12800
Total Alkalinity as CaCO ₃	mg/L	28	25
Sulfate as SO ₄ - Turbidimetric	mg/L	3820	4820
Chloride	mg/L	1150	1450
Calcium	mg/L	434	482
Magnesium	mg/L	216	348
Sodium	mg/L	1110	1470
Cadmium	mg/L	2.36	2.47
Lead	mg/L	0.293	2.44
Manganese	mg/L	248	472
Zinc	mg/L	641	768
Iron	mg/L	0.05	<0.05

4.2 Surface Water

Insufficient rainfall for opportunistic surface water sampling during April 2016

Surface Water Table Nov 2015 to Nov 2016

EPA Identification Number	Frequency	Comment
EPL29 (Federation Way culvert)	2 x Per year when contains water	No sample - dry
EPL31 (Ryan Street Dam)	2 x Per year when contains water	No sample - dry
EPL32 (S1-A adjacent olive grove)	2 x Per year when contains water	No sample - dry
EPL33 (Horwood Dam)	2 x Per year when contains water	Sampled Jan & Feb 2016
EPL34 (Upstream Bonanza St)	2 x Per year when contains water	No sample - dry
EPL35 (Downstream Sydney Rd)	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	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C					km/h	local	°C	%	g th		km/h	hPa	°C	%	g th		km/h	hPa
1	Fr						WNW	35	11:14				N	13	1017.7				WNW	20	1015.4
2	Sa						W	37	10:07				NW	19	1018.5				SW	24	1018.4
3	Su						ESE	35	09:33				ESE	24	1025.0				SSE	20	1021.6
4	Mo						SSW	26	11:27				SE	19	1021.4				SE	9	1016.2
5	Tu						WNW	31	11:34				NNE	13	1015.8				W	15	1012.2
6	We						SSW	52	15:03				S	26	1017.3				SSW	37	1017.6
7	Th						SE	41	10:38				ESE	28	1024.5				SE	19	1021.6
8	Fr						E	31	05:08				SSE	17	1024.5				S	19	1021.1
9	Sa						ESE	28	09:27				E	19	1023.5				SSW	17	1020.1
10	Su						SSW	33	15:20				SE	17	1023.4				SSW	20	1020.8
11	Mo						S	43	12:28				S	24	1025.0				SSW	24	1021.8
12	Tu						SSE	43	13:21				S	22	1025.8				SE	19	1022.2
13	We						SE	31	12:05				SSE	13	1025.6				SSE	19	1022.5
14	Th						E	30	10:00				ESE	17	1025.2				E	11	1021.4
15	Fr						NW	41	13:56				NNE	9	1021.9				NNW	22	1017.9
16	Sa						SSW	41	22:56				SSW	20	1020.3				SSE	17	1017.2
17	Su						SSW	39	07:42				S	22	1021.9				SSE	22	1018.0
18	Mo						WSW	26	14:24				NE	15	1019.3				SSW	9	1015.4
19	Tu						N	43	13:30				ENE	22	1018.3				E	11	1015.1
20	We						NNE	56	10:23				NNE	37	1018.7				N	24	1015.7
21	Th						S	46	20:45				SSE	19	1020.2				SW	15	1018.7
22	Fr						S	46	14:12				S	26	1026.2				SSW	31	1023.5
23	Sa						SSE	43	10:12				SSE	26	1028.1				SSE	24	1025.0
24	Su						E	39	12:27				ESE	15	1028.3				SE	17	1024.8
25	Mo						E	39	14:32				NE	20	1027.6				ENE	19	1024.1
26	Tu						NNE	39	12:32				NNE	20	1025.6				NE	24	1020.9
27	We						NNE	46	10:20				NNE	19	1020.2				N	19	1016.7
28	Th						NNW	31	12:13				NNE	11	1019.1				WNW	13	1015.7
29	Fr						N	54	05:43				NW	22	1017.0				N	6	1014.6
30	Sa						NNW	50	22:58				N	13	1017.0				NNW	20	1012.5
Statistics for April 2016																					
Mean														19	1022.1					18	1019.0
Lowest													NNE	9	1015.8				N	6	1012.2
Highest							NNE	56					NNE	37	1028.3				SSW	37	1025.0
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	2/5/2016	10/5/2016	2/6/2016
TEOM	Real time	-	2/6/2016
Dust Deposition	9/5/2016	24/5/2016	2/6/2016
Water	5/4/2016	12/4/16	2/6/2016
Blast Vibration and overpressure	Real Time	-	2/6/2016

7 Correction Log March 2016

There are no corrections for the previous month

8 Attachments

Field monitoring data for April has been entered in to google forms. There are no attachments.