

Monthly Environmental Data September 2014

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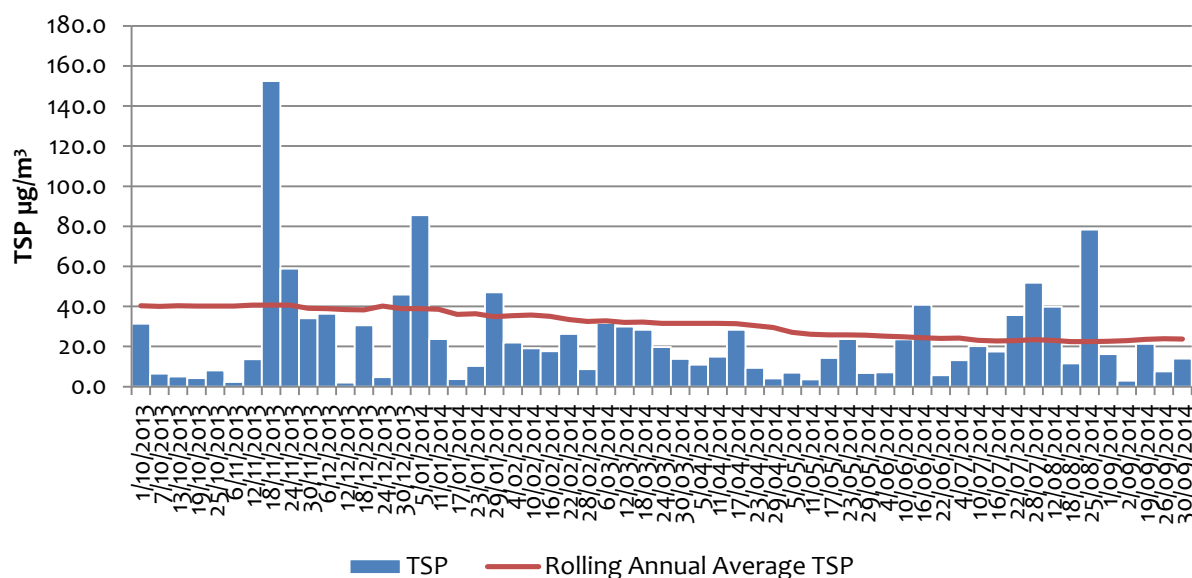
1 Air Quality

1.1 High Volume Air Samplers

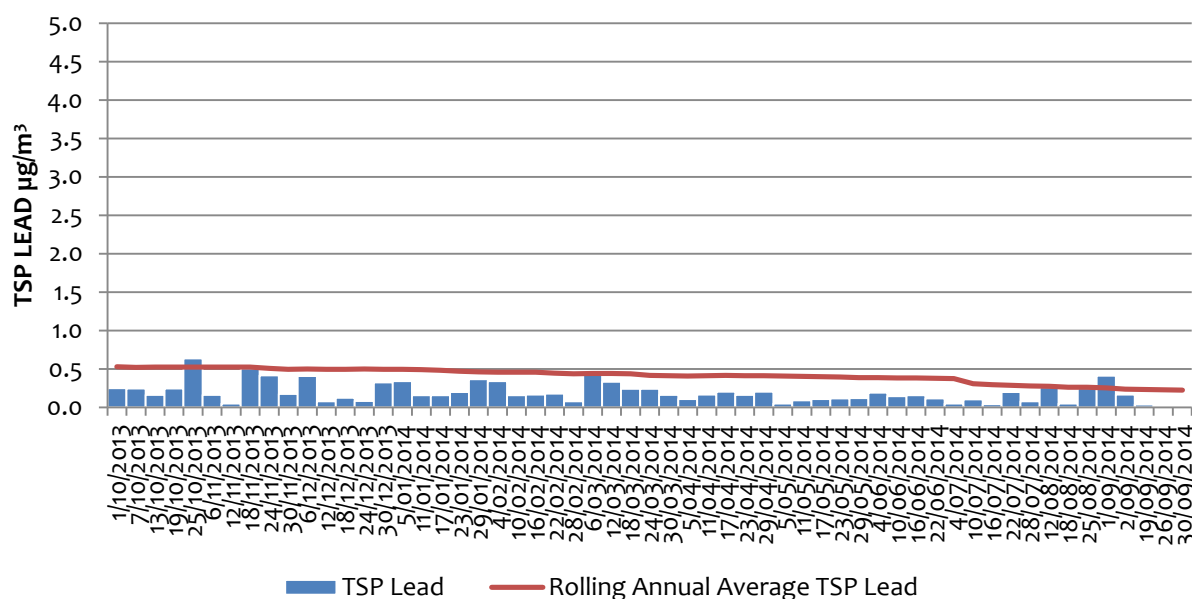
EPL10 - SILVER TANK - ON SITE

DATE	TSP ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
1/09/2014	16	0.41
2/09/2014	3	0.17
19/09/2014	21	0.04
26/09/2014	8	0.00
30/09/2014	14	0.00

Total Suspended Particles

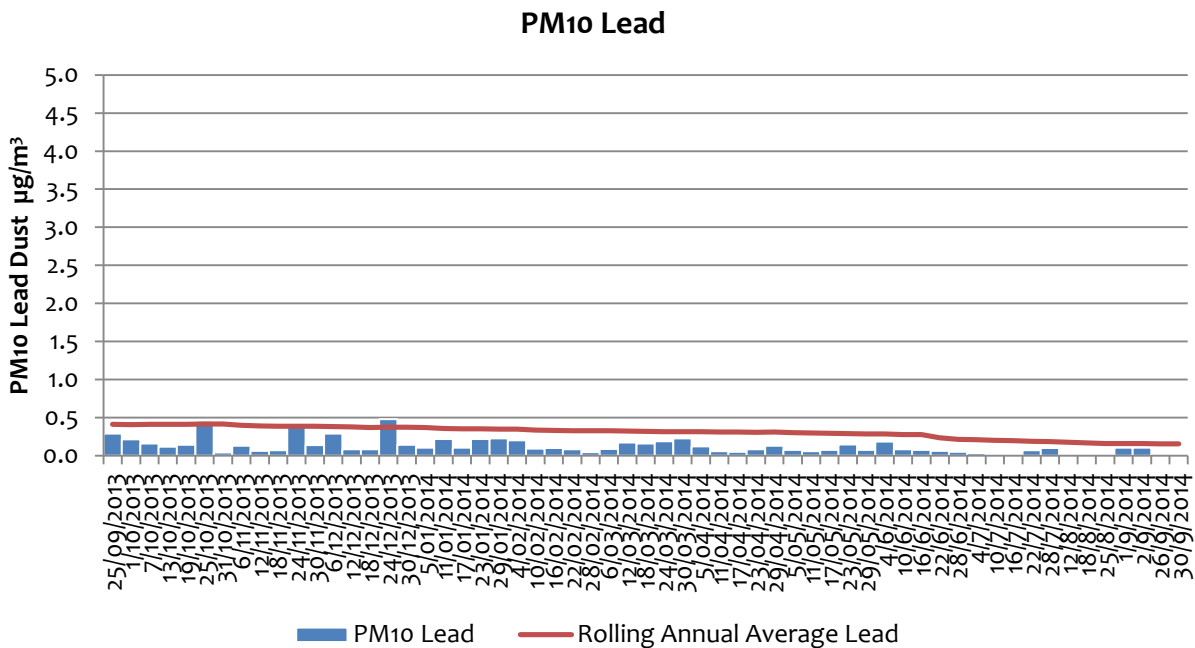
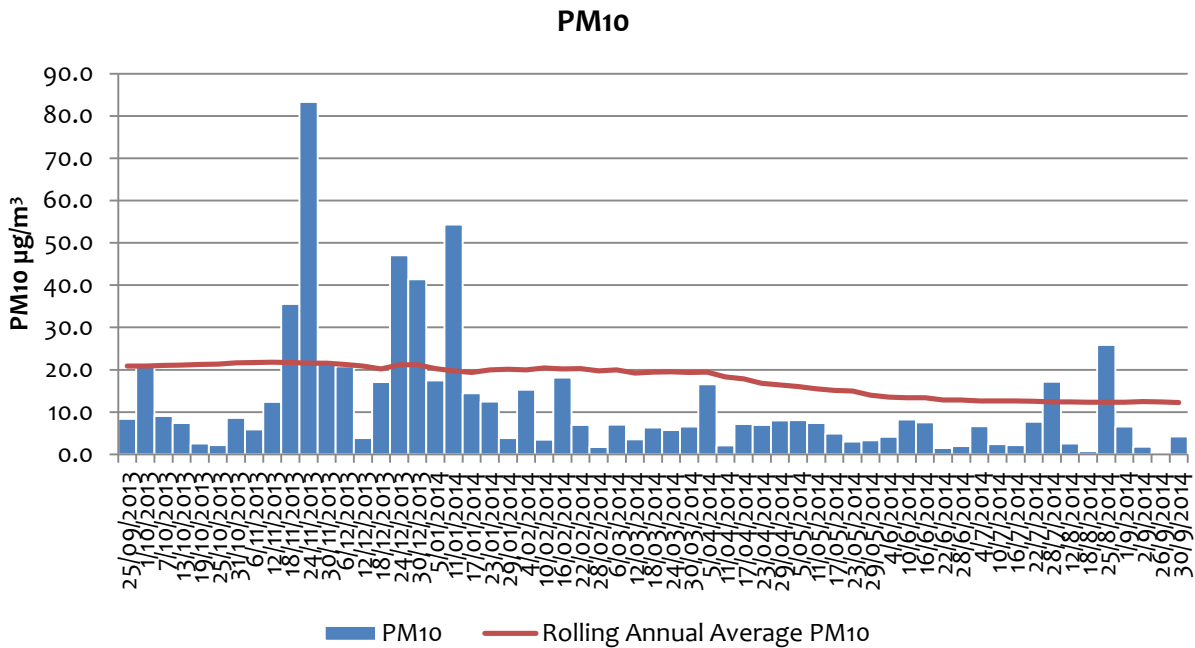


Total Suspended Particles - Lead



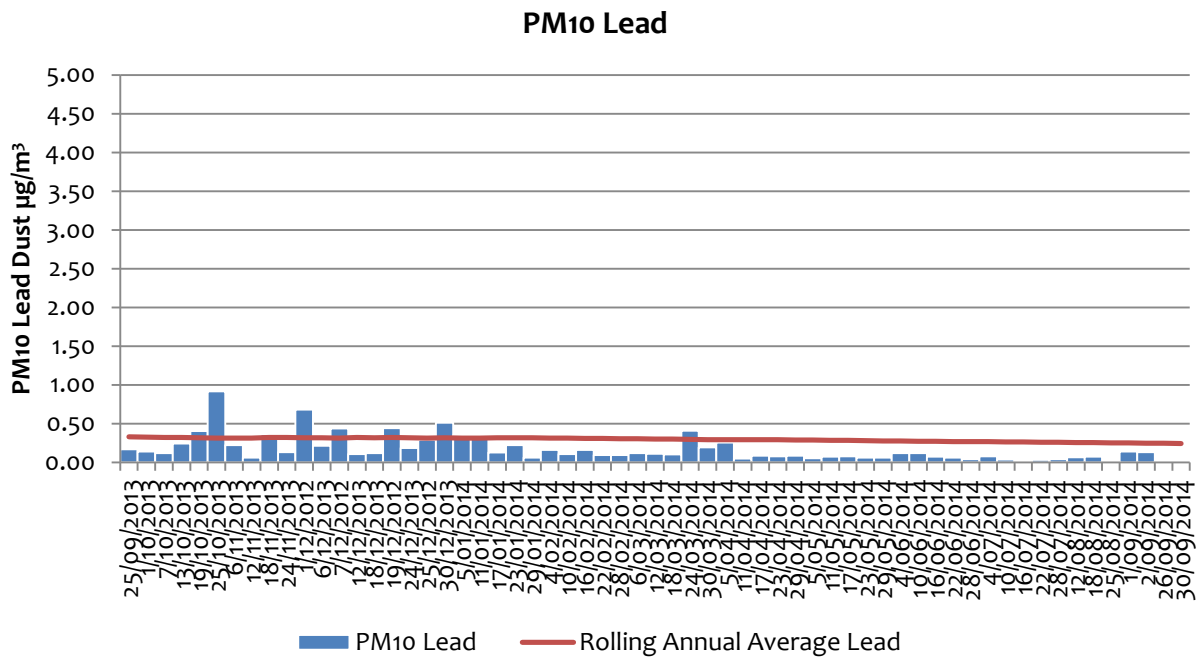
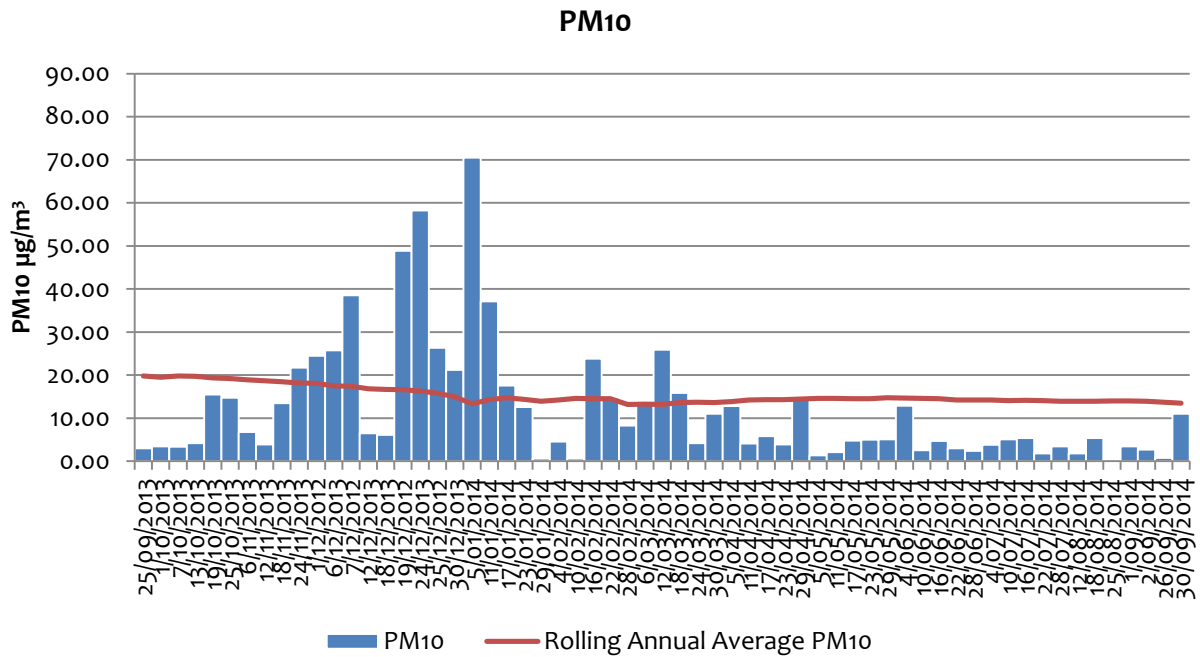
EPL11 - Silver Tank - On Site

DATE	PM10 ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
1/9/2014	7	0.11
2/9/2014	2	0.11
26/9/2014	0	0.01
30/9/2014	4	0.01



EPL12 - Blackwoods Pit – On Site

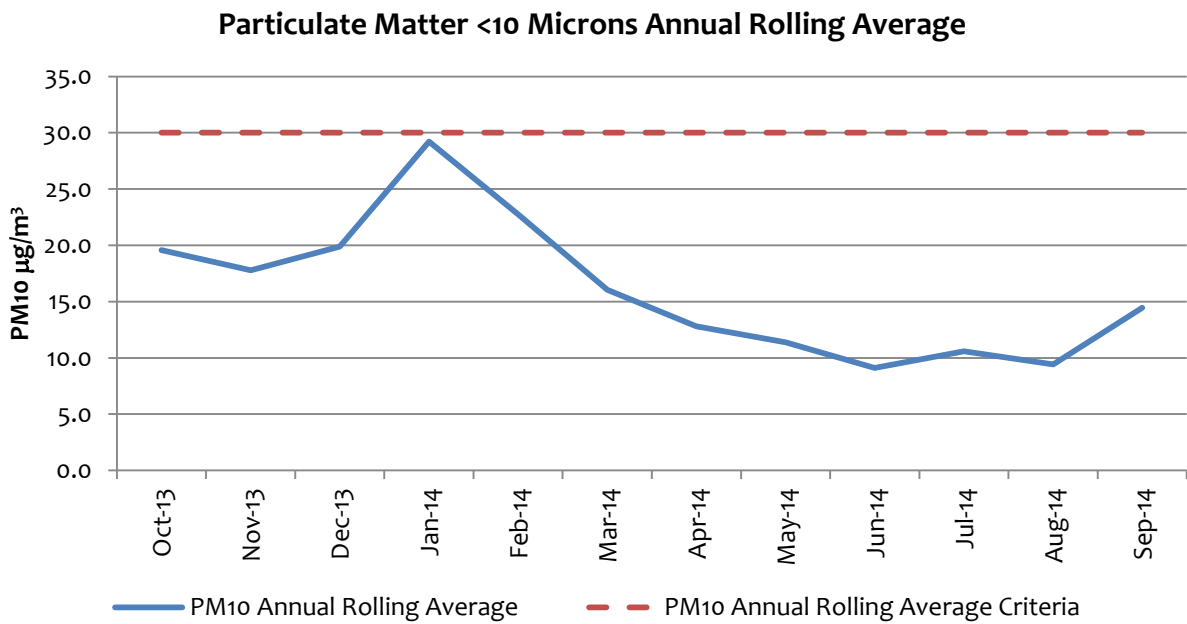
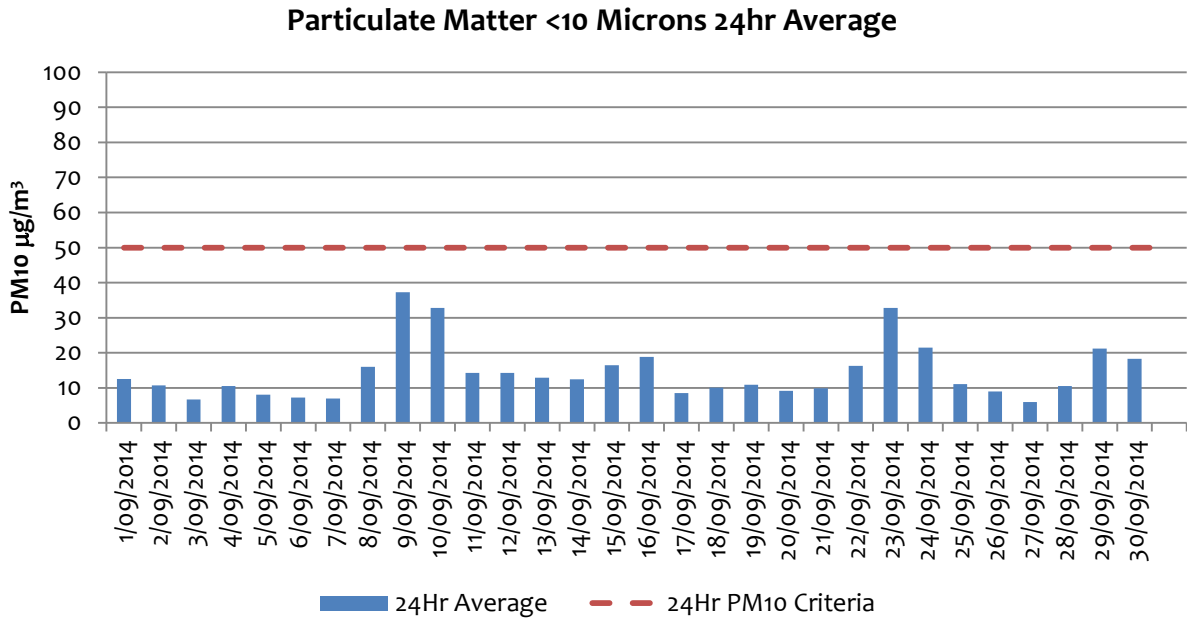
DATE	PM10 ($\mu\text{g}/\text{m}^3$)	Lead ($\mu\text{g}/\text{m}^3$)
1/09/2014	3.45	0.14
2/09/2014	2.68	0.13
26/09/2014	0.77	0.01
30/09/2014	11.07	0.01

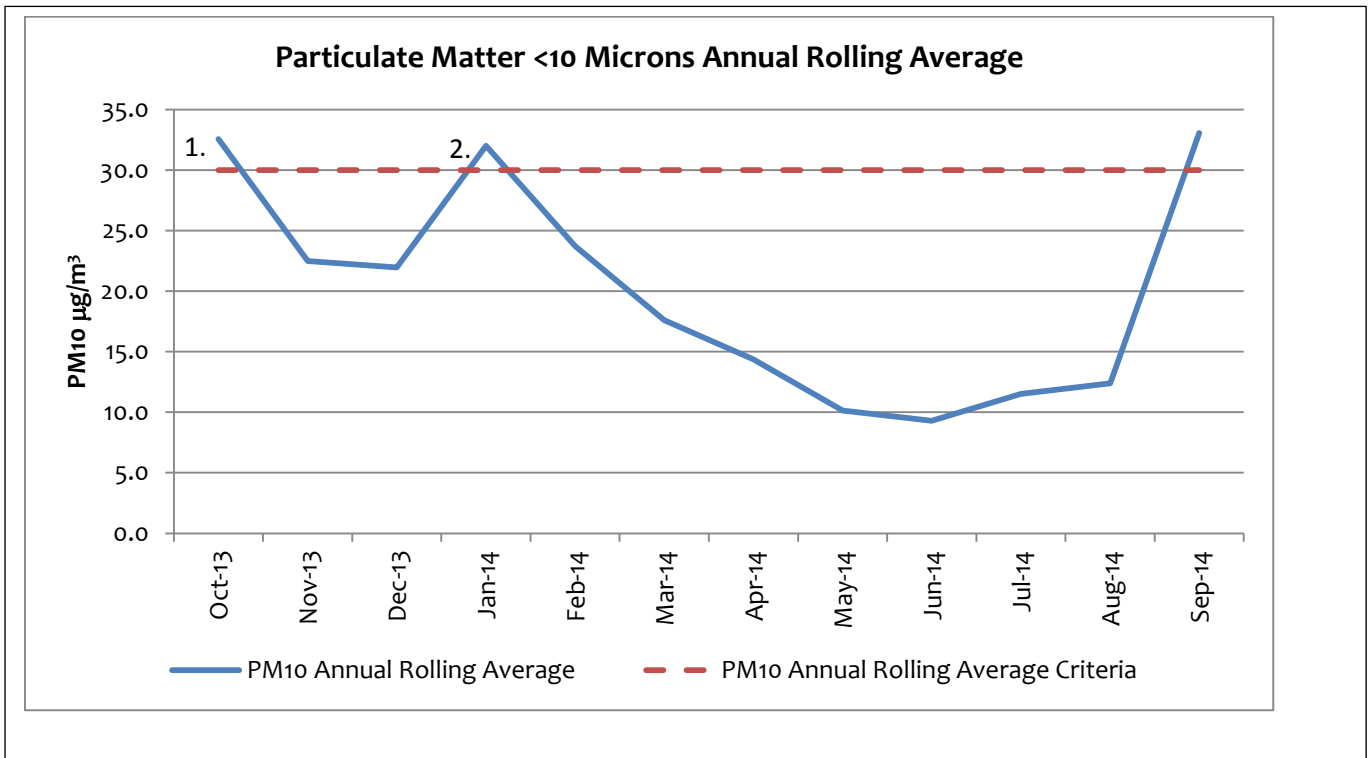
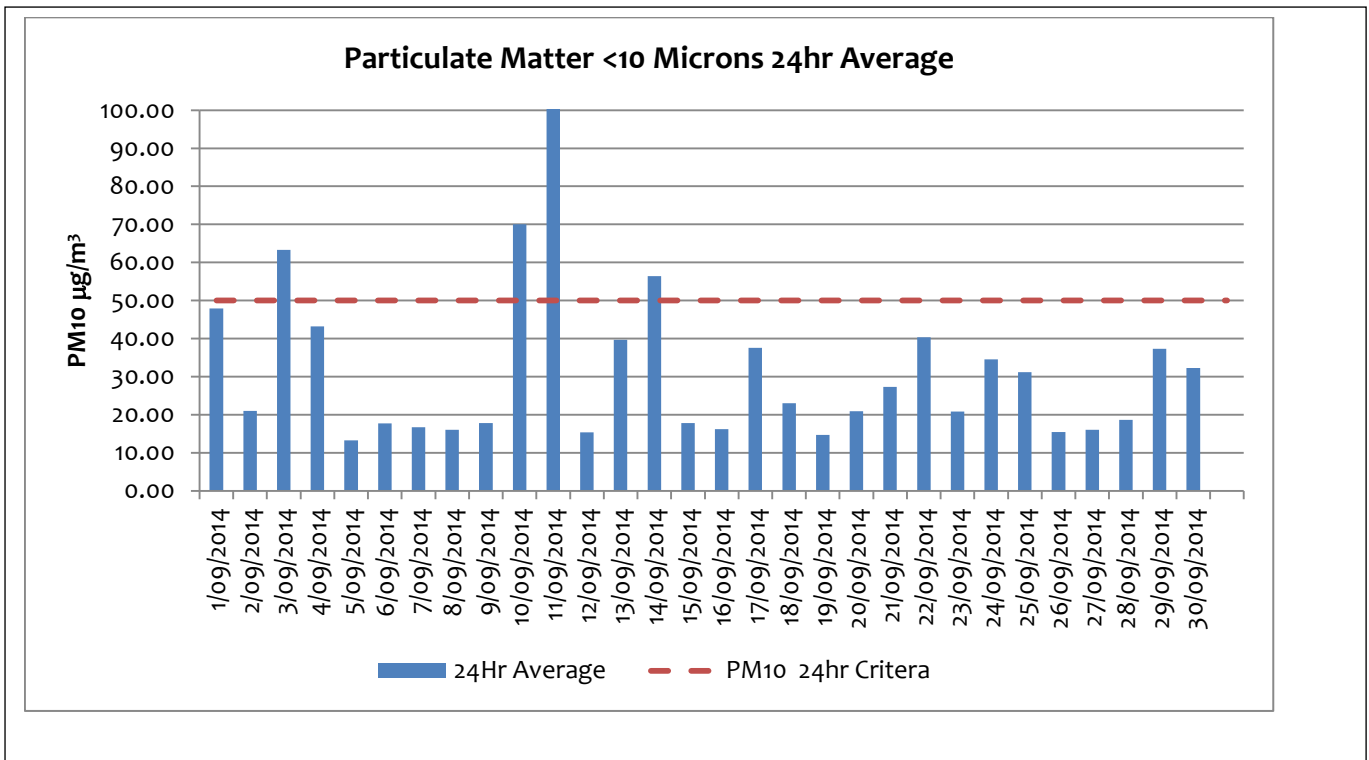


1.2 Tapered Element Oscillating Microbalance Sampling (TEOM)

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
1/09/2014	12.54	47.91
2/09/2014	10.76	21.01
3/09/2014	6.68	63.33
4/09/2014	10.54	43.21
5/09/2014	8.09	13.30
6/09/2014	7.27	17.75
7/09/2014	6.98	16.76
8/09/2014	16.01	16.07
9/09/2014	37.28	17.79
10/09/2014	32.83	70.00
11/09/2014	14.24	148.92
12/09/2014	14.25	15.33
13/09/2014	12.95	39.64
14/09/2014	12.44	56.38
15/09/2014	16.49	17.79
16/09/2014	18.84	16.21
17/09/2014	8.49	37.54
18/09/2014	10.06	23.01
19/09/2014	10.89	14.70
20/09/2014	9.2	20.95
21/09/2014	9.91	27.35
22/09/2014	16.31	40.31
23/09/2014	32.79	20.87
24/09/2014	21.51	34.51
25/09/2014	11.07	31.17
26/09/2014	8.99	15.42
27/09/2014	5.96	16.03
28/09/2014	10.54	18.63
29/09/2014	21.25	37.32
30/09/2014	18.27	32.29

PM10 $\mu\text{g}/\text{m}^3$ 12 Month Rolling Average												
	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
TEOM 1 EPL13 Essential Water Off Site	19.6	17.8	19.9	29.2	22.7	16.0	12.8	11.4	9.1	10.6	9.4	14.4
TEOM 2 EPL14 Blackwoods Pit On Site	32.6	22.5	22.0	32.0	23.7	17.6	14.4	10.2	9.3	11.5	12.4	33.0





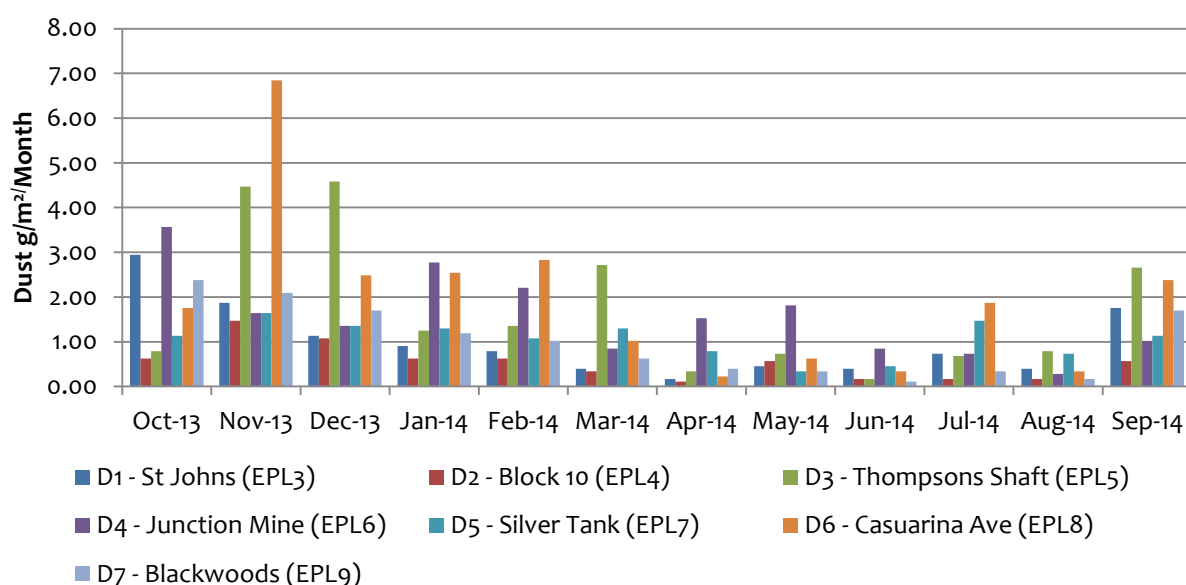
1. SW Winds of up to 81Km/h During the month of October 2013 with an Average Temp o 27°C .
2. S Winds of up to 72km/h during the month of January 2014 with an average Temperature of 36°C
Dust suppression was reapplied during the month of January 2013.

1.3 Dust Deposition Sampling

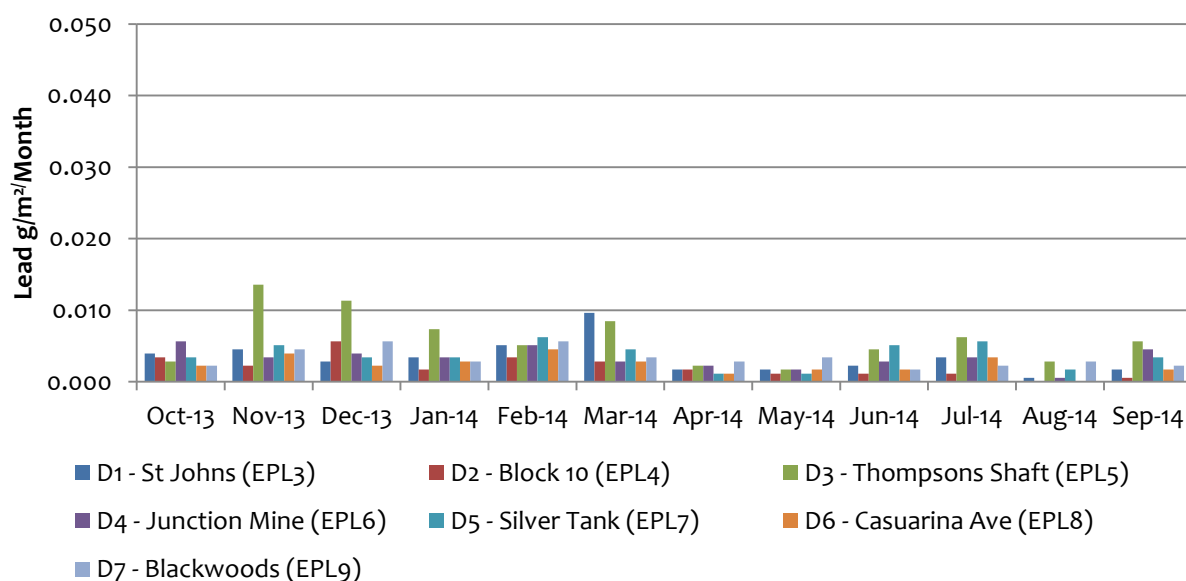
Total Deposited Dust (g/m ² /Month)							
Date	D1 (off site)	D2	D3	D4	D5	D6 (off site)	D7
September 2014	1.75	0.57	2.66	1.02	1.13	2.38	1.70
Background Average	4.0	3.1	4.3	5.7	n/a	5.8	n/a

Total Deposited Lead (g/m ² /Month)							
Date	D1 (Off Site)	D2	D3	D4	D5	D6 (Off Site)	D7
September 2014	0.002	0.001	0.006	0.005	0.003	0.002	0.002
Background Average	0.0034	0.0045	0.0046	0.0060	n/a	0.0036	n/a

Monthly Total Deposited Dust



Monthly Total Deposited Lead



2 Blasting (Vibration and Overpressure)

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

- During the month of July blasting occurred daily, there was a total number of 158 blasts, 5 of which were production firings all inside licensing criteria.
- 153 blasts were below a ppv of 0.75mm/s and did not trigger an event
- 1 Blasts recorded a ppv of >5mm/s
- 0 Blasts recorded a ppv of >10mm/s
- All overpressure readings were inside limits.

Date / Location	Peak Vibration (PPV mm/s)	Peak Over Pressure (dBL)
1/09/2014	5.76	101
V3	5.76	98.8
V2	3.87	101
V1	Did Not Trigger	Did Not Trigger
5/09/2014	4.44	97.5
V1	4.44	97.5
V2	2.72	97.5
V3	Did Not Trigger	Did Not Trigger
9/09/2014	1.6	94
V1	1.6	94
V2	Did Not Trigger	Did Not Trigger
V3	0.66	94
15/09/2014	3.08	115.7
V1	Did Not Trigger	Did Not Trigger
V2	3.08	115.7
V3	1.62	97.5
17/09/2014	2.27	104.9
V1	Did Not Trigger	Did Not Trigger
V2	1.54	104.9
V3	2.27	100

3 Noise

- *No noise monitoring was scheduled for the month of September 2014*
- *Last sampled March 2014 by EMM consultants for crusher project approval modification*

4 Water

4.1 Ground Water

Date of sample	26/09/2014	26/09/2014
Sample ID	Shaft #7	U/G Supply
pH Value (pH)	5.96	6.43
Electrical conductivity (uS/cm)	10700	11200
Total Dissolved Solids (mg/L)	12500	12300
Hydroxide Alkalinity as CaCO ₃ (mg/L)	1	1
Carbonate Alkalinity CaCO ₃ (mg/L)	1	1
Bicarbonate Alkalinity as CaCO ₃ (mg/L)	6	21
Total Alkalinity (mg/L)	6	21
Sulphate as SO ₄ (mg/L)	5920	5010
Chloride (mg/L)	1220	1490
Calcium (mg/L)	571	634
Magnesium (mg/L)	274	338
Sodium (mg/L)	1800	2190
Cadmium (mg/L)	3.17	259
Manganese (mg/L)	1.14	1.31
Lead (mg/L)	433	354
Zinc (mg/L)	1360	1030
Iron (mg/L)	0.05	0.67

4.2 Surface Water

Insufficient water was available for samples at surface water locations.

Surface Water Table

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	Insufficient water for sample
EPL32	2 x Per year when contains water	Insufficient water for sample
EPL33 Horwood Dam	2 x Per year when contains water	Sample due in October
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 September.

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

Most observations from Broken Hill (Patten Street), but some from Broken Hill Airport.

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	Mo	15.6	20.7	0			NW	46	08:13	19.3	23	8	NNW	26	1013.3	15.1	73	8	SW	24	1013.3
2	Tu	4.4	14.7	6.6			SSW	50	10:18	8.0	81	1	SW	33	1022.9	13.2	50	6	SSW	26	1021.7
3	We	2.7	16.1	0			SW	22	12:41	7.1	86	3	SSE	7	1024.7	14.8	43	7	W	6	1020.6
4	Th	5.9	16.4	0.2			NE	24	08:46	11.7	53	7	NE	20	1018.8	14.7	48	8	SE	9	1016.5
5	Fr	5.9	18.7	4.4			SE	37	11:45	12.4	61	1	ESE	22	1022.8	18.3	33	2	SE	22	1021.0
6	Sa	8.5	20.3	0			SSE	52	15:25	12.1	50	7	ENE	24	1026.6	19.6	25	5	ESE	24	1023.5
7	Su	6.9	20.8	0			E	35	10:58	13.7	57	1	NE	20	1024.4	19.7	33	2	NE	17	1020.6
8	Mo	8.3	23.5	0			NNE	61	22:43	14.7	67	1	NNE	26	1021.0	23.2	32	1	NNE	33	1013.8
9	Tu	13.9	27.3	0.2			WSW	83	19:13	19.7	42	2	NNW	48	1007.9	26.9	22	1	WNW	43	1004.2
10	We	6.8	22.3	1.0			SW	35	09:04	12.8	72	1	SSW	26	1019.0	22.0	30	1	WNW	19	1016.7
11	Th	8.3	22.9	0			SW	30	12:13	14.7	63	0	SSW	15	1022.6	22.3	34	0	SW	11	1020.1
12	Fr	6.2	20.9	0			ESE	28	10:46	13.1	51	0	ESE	19	1027.2	20.3	37	1	SSW	17	1023.8
13	Sa	7.7	23.9	0			ENE	30	09:48	14.6	36	0	NE	22	1026.1	23.9	21	0	SSE	9	1021.5
14	Su	9.9	27.1	0			NNW	28	10:37	19.1	32	0	N	15	1021.2	26.5	20	1	NW	11	1016.7
15	Mo	15.2	22.7	0			WSW	69	16:22	20.1	21	2	NNW	20	1012.9	20.6	34	3	W	44	1011.1
16	Tu	7.6	20.5	0.2			SSW	50	07:49	11.7	76	6	SSW	35	1018.3	19.7	37	2	SSW	24	1015.2
17	We	7.5	20.0	0			WSW	61	16:15	12.3	62	1	SSW	30	1021.0	18.1	37	6	SW	22	1019.4
18	Th	5.3	19.0	0			SW	35	15:27	10.1	62	3	SE	17	1026.1	18.6	31	3	SW	15	1022.1
19	Fr	7.6	19.7	0			E	31	09:22	13.2	44	3	E	19	1025.1	19.1	29	1	WSW	13	1022.1
20	Sa	7.1	21.3	0			ESE	35	12:34	15.7	33	1	E	17	1026.8	20.8	23	1	SSE	13	1023.9
21	Su	7.8	22.2	0			SE	41	11:09	14.3	46	1	ESE	24	1030.0	21.4	20	0	SE	24	1025.8
22	Mo	10.2	25.3	0			E	46	10:18	17.7	32	0	NNE	17	1026.7	25.2	18	1	E	28	1022.2
23	Tu	12.2	23.8	0			NE	65	09:46	17.8	51	1	NNE	39	1022.9	23.6	34	6	NNE	28	1017.9
24	We	10.6	22.3	15.6			NW	46	01:48	12.7	100	8	NE	31	1013.6	21.7	51	6	NNW	20	1012.2
25	Th	9.9	21.1	3.2			SSW	46	07:47	12.8	87	8	SSW	28	1021.3	20.9	52	6	WSW	15	1019.4
26	Fr	6.8	21.0	0			SW	28	13:30	12.7	73	1	S	13	1023.2	20.1	40	1	S	13	1019.8
27	Sa	9.4	26.5	0			NW	31	12:13	18.2	50	0	NNE	15	1022.5	26.1	29	1	NNW	19	1019.2
28	Su	15.0	29.8	0			NNW	69	13:37	23.3	29	0	N	31	1017.3	29.3	14	1	N	37	1012.1
29	Mo	12.1	28.1	0			WSW	44	00:36	17.2	48	1	ESE	22	1017.2	26.2	27	5	N	13	1013.1
30	Tu	12.8	30.7	0			WNW	70	13:37	21.2	40	1	N	11	1017.0	30.2	16	1	W	41	1013.5
Statistics for September 2014																					
Mean		8.9	22.3							14.8	54	2		23	1021.3	21.4	33	2		21	1018.1
Lowest		2.7	14.7	0						7.1	21	0	SSE	7	1007.9	13.2	14	0	W	6	1004.2
Highest		15.6	30.7	15.6			WSW	83		23.3	100	8	NNW	48	1030.0	30.2	73	8	W	44	1025.8
Total				31.4																	

IDCJDW2020.201409 Prepared at 13:00 UTC on Tuesday 14 October 2014

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	N/A	14/10/2014	
TEOM	Real time	30/09/2014	
Dust Deposition	N/A	01/11/2014	
Water	03/10/2014	13/10/2014	
Blast Vibration and overpressure	Real Time	30/09/2014	

7 Correction Log August 2014

There are no corrections for last month