

WAMBO COAL PTY LIMITED

**MONTHLY ENVIRONMENTAL MONITORING
REPORT**

November 2013

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1.0 Introduction

This report presents environmental monitoring results for the reporting period **Friday 1 to Saturday 30 November 2013**. Monitoring during this period includes meteorological measurement, surface and ground water sampling, depositional dust sampling, High Volume Air Sampling, blasting events and PM10 real time air monitoring results. Real time noise monitoring results are reported in a quarterly format and can be found on the Peabody Wambo website at <http://www.peabodyenergy.com/content/404/Australia-Mining-New/New-South-Wales/Wambo-Mine>

2.0 Meteorological Data

Results for reporting period are available in **Appendix A**.

3.0 Surface Water Sampling

Surface water samples are collected in accordance with **AS/NZS 5667.4:1998 – *Guidance on sampling from lakes, natural and man-made*** and **AS/NZS 5667.6:1998 – *Guidance on sampling of rivers and streams***. All samples collected were analysed in the field for **pH**, electrical conductivity (**EC**) and temperature. Selected sites were analysed in a **NATA*** accredited laboratory for total suspended solids (**TSS**) and total dissolved solids (**TDS**).

*National Association of Testing Authorities - NATA is the authority that provides independent assurance of technical competence.

Surface water reporting for the period recorded TSS levels above trigger levels at SW27a, SW32a, SW44, SW45 and SW39. EC results for SW07 and SW44 were also outside trigger levels. TDS results for SW44 were recorded outside trigger levels for November 2013.

Table 1: Monthly Surface Water Results – November 2013

Sample Location	pH	EC (µS/cm)	TSS (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Temp (°C)	Comments
WOLLOMBI BROOK							
Wollombi Brook							
SW01 - Wollombi Brook Up	8.50	671	20	403	-	-	-
SW03 - Wollombi Brook Pump Out	7.70	1,299	7	714	<2	-	-
SW02 - Wollombi Brook Down	8.60	936	8	437	<2	-	-
SW40 - Confluence with SWC	8.80	717	10	341	-	-	-
NORTH WAMBO CREEK							
North Wambo Creek							
SW04 - North Wambo Creek Up	-	-	-	-	-	-	Sample site dry
SW27a - North Wambo Creek Middle Lower	8.50	495	840	706	-	-	
SW32a - North Wambo Creek Pump	8.60	440	910	591	-	-	Sample site dry
SW05 - North Wambo Creek Down	7.90	910	50	389	-	-	-
SOUTH WAMBO/STONY CREEK							
South Wambo/Stony Creek							
SW06 - South Wambo Creek	8.30	508	51	261	-	-	-
SW07 - South Wambo/Stony Creek	9.10	865	7	387	-	-	-
SW08 - Stony Creek	-	-	-	-	-	-	Sample site dry
LONGFORD/DOCTOR'S CREEKS							
SW43 - Longford Creek Up	8.40	146	58	157	<2	-	-
SW44 - Longford Creek Down	8.20	375	2,410	404	<2	-	-
SW46 - Doctors Creek Up	8.90	2,760	625	1,640	<2	-	-
SW45 - Doctors Creek Down	8.60	1,537	1,840	1,130	<2	-	-
WATERFALL CREEK							
SW39 - Waterfall Creek Midstream	8.60	205	720	371	-	-	-
MINE WATER DAMS							
SW11 - West Cut Dam Pipe	Not Pumping						
SW12 - West Cut Dam	9.20	3,800	-	-	-	-	-
SW14 - Box Cut Dam (Admin)	8.80	966	-	-	-	-	-
SW15 - Eagles Nest Dam	9.00	6,770	50.00	4,710	-	-	-
SW20 - Dam Adjacent to West Cut Dam	8.90	2,720	-	-	-	-	-
SW29 - SCB Dam	8.70	1,402	-	-	-	-	-
SW30 - Turkeys Nest	9.20	7,320	-	-	-	-	-
SW31 - Gordon Below Franklin	9.40	3,390	-	-	-	-	-
SW37 - Wollemi Sump	8.40	884	-	-	-	-	-
SW38 - Homestead Open Cut	8.80	6,860	-	-	-	-	-
SW47 - NWU Pumpout Water	-	-	-	-	-	-	Sample site dry
SW48 - Inpit sample	8.60	5,950	-	-	-	-	-
SW49 - Bates Pit Pumpout	8.30	2,670	-	-	-	-	-
SW51 - South Dam	9.1	7,670	-	-	-	-	-
SW50 - Hunter River Water	Not Pumping						

Note: Figures in bold fall outside trigger levels.

4.0 Groundwater Sampling

Table 2: Ground Water Results – November 2013

Sample Location	pH	EC ($\mu\text{S/cm}$)	Depth to Water (m)	Temp ($^{\circ}\text{C}$)	Comments
GW02	-	-	-	-	-
GW11	-	-	-	-	-
P106	-	-	-	-	-
P109	-	-	-	-	-
P110	-	-	-	-	-
P111	-	-	-	-	-
P114	-	-	-	-	-
P116	-	-	-	-	-
P202	-	-	-	-	-
P206	-	-	-	-	-
P301	-	-	-	-	-
P311	-	-	-	-	Collapsed
P315	-	-	-	-	-
GW12	-	-	-	-	-
GW13	-	-	-	-	-
GW14	-	-	-	-	-
GW15	-	-	-	-	-
GW16	-	-	-	-	-
GW17	-	-	-	-	-
GW18	-	-	-	-	-
GW19	-	-	-	-	-
GW20	GW20 is a vibration wire multi-piezometer installation				
GW21	-	-	-	-	-
GW22	-	-	-	-	-
P1	-	-	-	-	-
P3	-	-	-	-	-
P5	-	-	-	-	-
P6	-	-	-	-	-
P11	-	-	-	-	-
P12	-	-	-	-	-
P13	-	-	-	-	-
P15	-	-	-	-	-
P16	-	-	-	-	-
P17	-	-	-	-	-
P18	-	-	-	-	-
P20	-	-	-	-	-

Note: All depths measured to top of casing, except United bores which are to ground. Figures in bold are outside trigger levels listed in Table 5 of the Ground Water Monitoring Programme (GWMP), which is part of the Site Water Management Plan.

* Represents data that is provided on a quarterly basis. The results are to be updated once available.

5.0 Depositional Dust Sampling

Sixteen (Table 3) depositional dust gauges were collected for the reporting period. Sampling and analysis is conducted in accordance with AS 3580.10.1 – 1991 – *Determination of particulates – Deposited matter – Gravimetric method*. All gauges were analysed for insoluble solids (IS) and ash residue (AS). Field observations include water quantity and quality, and any visible contaminants in the sample.

Table 3: Dust Deposition Results – November 2013

Site	Insoluble Solids (IS) (g/m ² .month)	Ash Residue (AR) (g/m ² .month)	IS:AR Ratio	IS YTD Average (g/m ² .month)	AR YTD Average (g/m ² .month)
D01	4.1	1.5	37	6.9	4.8
D03	2.8	2.0	71	2.9	2.2
D07	8.7	6.3	72	5.1	3.4
D09	4.9	2.4	49	5.0	3.0
# D11	3.0	2.3	77	2.8	2.1
# D12	3.6	2.6	72	2.9	2.3
# D17	2.4	1.8	75	2.9	1.6
D19	3.6	2.6	72	3.1	2.3
D20	1.2	0.7	58	1.7	1.2
# D21	1.60	1.20	75	1.8	1.6
# D22	2.2	1.4	64	2.0	1.6
D23	14.1	4.8	34	2.8	1.5
# D24	-	-	-	-	-
# D25	2.2	1.6	73	2.3	1.7
D26	1.8	1.2	67	1.3	0.9

Note:

Results in **bold** are YTD average above 4g/m²/month

Results # are dust gauges not on WCPL owned land. DD gauges on Wambo Coal land and above criteria level are not considered non-compliance.

Insoluble solid results are reported on the **annual average of 4g/m²/month** of all **uncontaminated results** which are not located on Wambo Coal owned land. All Depositional Dust gauges located outside of Wambo owned land were within prescribed criteria level for the reporting period.

6.0 High Volume Air Sampling

Four high volume air sampler (HVAS) operated at locations surrounding Wambo during the reporting period (Table 4). All units sampled Total Suspended Particulates (TSP) over a 24-hour period on a six day cycle, in accordance with AS 2724.3 – 1984 – *Determination of total suspended particulates (TSP) – High volume sampler gravimetric method*.

Table 4: HVAS Results – November 2013

Date of Run	HV01 - Coralie TSP ($\mu\text{g}/\text{m}^3$)	HV02 - Caban TSP ($\mu\text{g}/\text{m}^3$)	HV03 - Thelander TSP ($\mu\text{g}/\text{m}^3$)	HV04 - Muller TSP ($\mu\text{g}/\text{m}^3$)
05/11/13	94.6	70.4	72.4	121
11/11/13	19.8	20.9	14.4	25.8
17/11/13	13	14.2	11.1	23.2
23/11/13	39.3	33.3	23.6	28.5
29/11/13	36.9	52.3	35.7	34.2
Monthly Mean	41	38	31	47
Yearly Mean	58	60	39	47

Reported yearly means are below the yearly mean reporting criteria of $90\mu\text{g}/\text{m}^3$.

7.0 Blast Events

Four monitoring sites measure ground vibration and air blast overpressure for blasts conducted at Wambo. Five blasts were conducted during the reporting period. Monitoring at all five sites is conducted under the blast monitoring requirements set out in the **Wambo EPA licence (EPL 529) and DA 305-7-2003**.

All blast events for November 2013 were within the prescribed criteria limits.

Table 5: Blast Results – November 2013

Date	Time	Location	Kelly Residence – A0728			Wambo Homestead – A0722			Harris Site – A6006			Muller Residence – A6005		
			Over Pressure (dB(L))	Vibration (mm/s)	Wave-form	Over Pressure (dB(L))	Vibration (mm/s)	Wave-form	Over Pressure (dB(L))	Vibration (mm/s)	Wave-form	Over Pressure (dB(L))	Vibration (mm/s)	Wave-form
06/11/13	15:26	M18RCA1	90.9	0.05	YES	95.8	0.08	YES	97.9	0.05	YES	107.2	0.22	YES
08/11/13	15:29	M12WRC4	103.5	0.12	YES	107.5	0.28	YES	105.6	0.23	YES	105.9	0.22	YES
15/11/13	11:04	M4WTA2	95.7	0.15	YES	98.8	0.13	YES	105.6	0.23	YES	114.1	0.32	YES
20/11/13	15:41	M15WRC3	88.9	0.06	YES	96.1	0.06	YES	97.9	0.07	YES	95.9	0.28	YES
27/11/13	15:29	B55WWA3	101.0	0.26	YES	*	*	NO	104.0	0.27	YES	114.4	0.14	YES

*Software glitch – No result.

8.0 Real-Time Air Quality Monitoring

Four real time Tapered Element Oscillating Microbalance (**TEOM**) units were in operation during the reporting period. The sites are located at Coralie (**PM01**), the Caban residence (**PM02**), Thelander residence (**PM03**) and the Muller residence (**PM04**). These units measure particulate matter less than 10 microns in diameter (PM_{10}) on a continuous basis and provide a 24 hour average result. These units operated and sampled in accordance with **AS 3580.9.8 - 2002, *Method for Sampling and Analysis of Ambient Air - Determination of Suspended Particulate Matter - PM_{10} Continuous Direct Mass Method using a Tapered Element Oscillating Microbalance Analyser.***

All **PM10** sites were within the yearly average criteria limits of **30ug/m³** for this reporting period.

Table 6
PM₁₀ Results – November 2013

Date of Run	AQ01 (Coralie)		AQ02 (Wambo Road)		AQ03 (Thelander)		AQ04 (Muller)	
	PM10 24 Hour Result (ug/m ³)	YTD Average	PM10 24 Hour Result (ug/m ³)	YTD Average	PM10 24 Hour Result (ug/m ³)	YTD Average	PM10 24 Hour Result (ug/m ³)	YTD Average
01/11/13	21.7	19.01	24.0	22.71	19.4	16.12	24.5	16.19
02/11/13	32.9	19.06	28.5	22.73	22.8	16.14	21.9	16.21
03/11/13	54.5	19.17	56.9	22.84	42.5	16.23	37.4	16.28
04/11/13	30.3	19.21	23.4	22.84	26.9	16.26	22.6	16.30
05/11/13	22.1	19.22	19.6	22.83	21.3	16.28	28.1	16.34
06/11/13	20.5	19.22	27.4	22.85	26.4	16.31	37.2	16.40
07/11/13	36.7	19.28	37.0	22.89	34.8	16.37	37.3	16.47
08/11/13	41.5	19.35	50.5	22.98	39.3	16.45	39.7	16.55
09/11/13	26.7	19.37	*	22.98	16.5	16.45	15.6	16.54
10/11/13	18.2	19.37	*	22.98	14.5	16.44	17.7	16.55
11/11/13	3.6	19.32	*	22.98	3.7	16.40	5.3	16.51
12/11/13	10.5	19.29	6.6	22.93	6.3	16.37	9.0	16.49
13/11/13	14.9	19.28	11.2	22.89	9.1	16.34	12.5	16.47
14/11/13	19.2	19.28	17.6	22.88	13.4	16.33	16.4	16.47
15/11/13	18.0	19.27	16.3	22.85	16.9	16.34	16.9	16.48
16/11/13	9.1	19.24	7.3	22.81	7.7	16.31	10.2	16.46
17/11/13	5.3	19.20	4.8	22.75	4.9	16.27	6.3	16.42
18/11/13	6.5	19.16	5.8	22.70	5.8	16.24	5.6	16.39
19/11/13	9.2	19.13	9.0	22.65	8.2	16.21	10.7	16.37
20/11/13	13.5	19.11	15.7	22.63	12.1	16.20	15.1	16.37
21/11/13	18.2	19.11	15.5	22.61	16.3	16.20	18.0	16.37
22/11/13	12.8	19.09	12.4	22.58	13.0	16.19	14.1	16.37
23/11/13	7.4	19.05	6.7	22.53	3.9	16.15	5.5	16.33
24/11/13	14.3	19.04	13.1	22.50	13.2	16.14	9.5	16.31
25/11/13	13.6	19.02	11.8	22.47	12.5	16.13	14.2	16.31
26/11/13	18.8	19.02	16.8	22.45	18.6	16.14	18.5	16.31
27/11/13	19.1	19.02	18.7	22.44	18.9	16.15	20.9	16.33
28/11/13	23.5	19.03	24.1	22.44	16.2	16.15	17.5	16.33
29/11/13	20.8	19.04	19.2	22.43	20.3	16.16	20.6	16.34
30/11/13	12.9	19.02	13.2	22.41	15.4	16.16	13.4	16.34

Note:

Results in **red** are greater than the 24hr period guidelines of 50ug/m³

Results in **bold** are between 30ug/m³ and 50ug/m³

* Represents a value where the data could not be retrieved due to an operational error with the monitor.

Appendix A
Wambo Weather Station
Meteorological Data

Meteorological Data November 2013

Date	Temp (2m)			Temp (10m)			Temp Inversion			Humidity			Solar Radiation			Rain	Wind Speed		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	mm	Min	Avg	Max
01/11/13	15.8	20.7	28.2	16.5	21.0	27.9	-9.2	4.4	18.4	31.5	62.3	83.5	-1.4	260.1	971.7	0.0	0.0	1.7	5.5
02/11/13	11.2	23.3	34.9	12.8	24.1	34.8	-6.5	10.2	39.9	12.4	50.1	96.1	-1.4	283.1	953.7	0.0	0.0	2.4	7.0
03/11/13	11.2	24.2	35.0	13.7	25.2	35.0	-3.6	12.4	43.6	7.6	39.8	81.6	-1.5	206.8	853.5	0.0	0.0	3.6	7.8
04/11/13	12.5	17.0	22.6	13.6	17.3	21.9	-9.8	3.3	17.8	22.5	51.1	74.2	-1.5	282.3	1,065.2	0.0	0.0	3.1	8.3
05/11/13	11.1	16.1	21.2	12.7	16.6	20.8	-6.4	5.1	26.1	43.2	58.0	85.4	-1.5	159.1	772.4	0.0	0.0	2.5	5.2
06/11/13	5.2	17.0	28.0	7.9	17.8	27.8	-10.1	9.5	37.4	22.7	62.4	95.4	-2.7	325.8	967.6	0.0	0.0	1.5	5.5
07/11/13	9.4	22.8	34.9	11.1	23.4	34.1	-11.9	7.8	30.9	16.3	51.9	94.5	-1.5	301.9	927.3	0.0	0.0	2.1	5.7
08/11/13	11.8	26.9	37.7	14.0	27.8	37.4	-8.7	12.2	67.0	14.6	41.3	88.0	-1.5	294.3	967.9	0.0	0.0	2.6	7.5
09/11/13	19.7	27.8	35.2	20.0	28.1	34.8	-5.3	4.1	25.5	21.5	41.5	66.9	-1.4	279.7	933.1	0.0	0.7	4.3	8.3
10/11/13	14.8	18.2	22.3	15.3	18.5	22.3	-4.7	3.5	8.6	42.3	69.9	93.9	-1.5	81.0	504.0	0.7	1.1	3.1	6.4
11/11/13	14.5	17.0	20.3	15.0	17.3	20.1	-3.1	4.3	8.5	70.7	85.3	94.7	-1.5	107.8	625.6	16.6	0.8	3.0	4.9
12/11/13	14.4	18.3	25.4	14.9	18.8	25.5	-7.1	6.2	19.1	46.4	81.3	94.9	-1.5	165.5	1,024.9	14.1	0.0	1.3	4.6
13/11/13	11.9	21.0	30.9	12.8	21.7	30.7	-7.0	9.4	40.6	12.4	55.2	97.7	-1.5	337.9	999.1	0.0	0.0	1.9	5.5
14/11/13	10.3	21.1	31.1	12.1	22.0	30.9	-8.0	10.2	47.6	11.0	49.1	91.8	-2.1	346.5	1,002.7	0.0	0.1	2.7	6.4
15/11/13	16.0	20.2	26.8	16.9	20.7	26.5	-5.4	6.0	25.6	35.4	65.9	94.8	-1.5	218.9	1,095.8	4.4	0.6	2.5	6.8
16/11/13	15.1	17.2	21.5	16.0	17.7	21.6	-3.2	6.6	16.1	51.3	79.4	93.9	-1.5	107.8	863.8	1.4	0.7	2.0	4.5
17/11/13	14.1	16.2	19.7	14.7	16.6	19.6	-3.4	4.7	8.7	57.0	77.1	94.6	-1.5	111.6	528.6	13.9	0.2	2.6	5.5
18/11/13	14.0	15.1	17.6	14.5	15.7	17.9	2.5	7.6	20.0	70.6	86.6	96.6	-1.5	32.2	258.4	31.2	0.0	2.7	5.9
19/11/13	13.1	19.0	26.3	14.2	19.7	26.3	-2.4	8.8	26.3	44.8	78.4	97.1	-1.5	206.0	962.5	0.4	0.0	1.6	4.2
20/11/13	12.6	20.5	28.1	13.6	21.0	28.2	-2.4	7.1	20.8	45.1	75.1	97.5	-1.5	301.8	996.9	0.0	0.0	1.8	5.5
21/11/13	15.4	22.3	29.8	16.2	22.8	29.8	-2.5	6.3	16.9	45.0	72.2	96.1	-1.5	233.0	996.1	0.0	0.2	2.1	5.0
22/11/13	18.4	20.5	24.5	19.0	21.1	24.7	-1.6	7.0	13.4	67.2	83.7	94.7	-1.4	84.2	936.2	2.6	0.2	1.7	3.8
23/11/13	15.4	19.1	23.2	16.5	19.8	23.1	-4.6	8.0	20.0	66.0	86.5	97.1	-1.5	114.8	820.1	12.9	0.0	1.5	4.4
24/11/13	12.5	19.9	28.6	13.1	20.3	28.5	-8.3	5.3	20.3	24.5	66.6	98.1	-1.5	293.4	1,059.8	0.2	0.0	2.3	5.8
25/11/13	14.6	18.8	25.0	16.0	19.4	25.1	-8.0	7.4	23.5	40.0	69.5	92.3	-1.5	216.1	956.3	0.0	0.0	1.8	5.9
26/11/13	13.6	18.4	24.2	14.7	18.9	24.0	-5.2	5.4	15.9	38.0	56.1	79.5	-1.5	292.8	1,043.3	0.0	0.8	2.9	5.8
27/11/13	10.2	19.3	27.5	11.7	19.8	27.4	-8.0	7.2	21.0	30.2	61.4	95.3	-1.6	340.9	995.3	0.0	0.0	1.2	5.0
* 28/11/13	11.4	-	35.9	12.3	-	35.5	-15.7	-	55.7	17.0	-	95.5	-1.5	-	989.3	0.0	0.0	-	153.9
29/11/13	15.2	19.9	29.1	16.2	21.5	30.2	-102.0	-8.4	77.3	26.7	74.8	95.1	-1.5	43.0	345.6	36.0	0.1	2.1	7.2
30/11/13	12.9	17.6	26.3	14.3	18.1	35.5	-84.3	6.4	25.0	50.8	73.0	93.8	-1.5	189.6	1,215.2	1.1	0.0	2.6	7.3
MONTH	5.2	21.0	37.7	7.9	21.6	37.4	-102.0	6.1	77.3	7.6	62.1	98.1	-2.7	224.0	1,215.2	135.5	0.0	2.6	153.9

*Maintenance of logging instrumentation.