

WAMBO COAL PTY LIMITED

**MONTHLY ENVIRONMENTAL MONITORING
REPORT**

December 2013

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1.0 Introduction

This report presents environmental monitoring results for the reporting period **Sunday 1 to Tuesday 31 December 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 at SW32a and EC results for SW06 outside trigger levels.

Table 1: Monthly Surface Water Results – December 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	7.80	770	6	337	-	-	-
SW03 - Wollombi Brook Pump Out	7.50	1,070	1	425	<2	-	-
SW02 - Wollombi Brook Down	7.60	920	6	485	<2	-	-
SW40 - Confluence with SWC	8.20	745	6	341	-	-	-
NORTH WAMBO CREEK							
North Wambo Creek							
SW04 - North Wambo Creek Up	-	-	-	-	-	-	Sample site dry
SW27a - North Wambo Creek Middle Lower	8.60	2,700	45	1,500	-	-	-
SW32a - North Wambo Creek Pump	8.10	1,670	4,190	1,300	-	-	-
SW05 - North Wambo Creek Down	7.80	1,150	7	662	-	-	-
SOUTH WAMBO/STONY CREEK							
South Wambo/Stony Creek							
SW06 - South Wambo Creek	7.70	686	3	325	-	-	-
SW07 - South Wambo/Stony Creek	-	-	-	-	-	-	Sample site dry
SW08 - Stony Creek	-	-	-	-	-	-	Sample site dry
LONGFORD/DOCTOR'S CREEKS							
Longford/Doctors Creeks							
SW43 - Longford Creek Up	7.80	389	48	308	<2	-	-
SW44 - Longford Creek Down	7.60	520	42	516	<2	-	-
SW46 - Doctors Creek Up	8.60	1,664	240	976	3.0	-	-
SW45 - Doctors Creek Down	8.60	1,746	358	998	2.0	-	-
WATERFALL CREEK							
Waterfall Creek							
SW39 - Waterfall Creek Midstream	-	-	-	-	-	-	Sample site dry
MINE WATER DAMS							
Mine Water Dams							
SW11 - West Cut Dam Pipe	Not Pumping						
SW12 - West Cut Dam	9.10	3,970	-	-	-	-	-
SW14 - Box Cut Dam (Admin)	8.50	1,061	-	-	-	-	-
SW15 - Eagles Nest Dam	9.20	6,330	28.00	5,050	-	-	-
SW20 - Dam Adjacent to West Cut Dam	9.00	3,900	-	-	-	-	-
SW29 - SCB Dam	8.20	1,900	-	-	-	-	-
SW30 - Turkeys Nest	9.20	6,410	-	-	-	-	-
SW31 - Gordon Below Franklin	9.40	3,720	-	-	-	-	-
SW37 - Wollemi Sump	8.60	873	-	-	-	-	-
SW38 - Homestead Open Cut	8.90	6,950	-	-	-	-	-
SW47 - NWU Pumpout Water	-	-	-	-	-	-	Sample site dry
SW48 - Inpit sample	8.70	5,720	-	-	-	-	-
SW49 - Bates Pit Pumpout	8.40	3,150	-	-	-	-	-
SW51 - South Dam	9.30	7,310	-	-	-	-	-
SW50 - Hunter River Water	Not Pumping						

Note: Figures in bold fall outside trigger levels.

4.0 Groundwater Sampling

Table 2: Ground Water Results – December 2013

Sample Location	pH	EC (µS/cm)	Depth to Water (m)	Temp (°C)	Comments
GW02	6.80	484	6.48	19.7	-
GW11	6.80	529	4.77	19.4	-
P106	-	-	-	-	Bailed dry
P109	7.20	706	5.22	18.5	-
P110	6.70	644	4.81	19.6	-
P111	6.30	715	6.52	17.0	-
P114	6.40	6,480	5.60	19.4	-
P116	6.80	877	5.42	19.6	-
P202	7.50	5,730	8.37	20.9	-
P206	7.40	2,150	15.75	19.9	-
P301	6.40	6,010	15.53	20.0	-
P311	-	-	-	-	Collapsed
P315	7.10	546	7.98	19.4	-
GW12	-	-	-	-	Bailed dry
GW13	6.90	3,490	5.24	18.9	-
GW14	-	-	-	-	Dry
GW15	6.70	599	10.74	20.1	-
GW16	7.50	649	8.06	19.7	-
GW17	7.10	5,180	10.92	20.4	-
GW18	-	-	-	-	Dry
GW19	-	-	-	-	Dry
GW20	GW20 is a vibration wire multi-piezometer installation				
GW21	-	-	-	-	Bailed dry
GW22	8.40	6,710	35.65	21.70	-
P1	6.89	8,900	26.06	-	-
P3	-	-	-	-	Removed
P5	7.80	892	10.89	-	-
P6	-	-	-	-	Removed
P11	-	-	-	-	Dry
P12	6.65	644	7.13	-	-
P13	6.14	1,170	7.34	-	-
P15	7.57	7,530	6.30	-	-
P16	7.26	8,980	7.49	-	-
P17	7.53	11,500	6.33	-	-
P18	7.21	9,000	7.76	-	-
P20	7.13	11,400	8.12	-	-

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 – December 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	19.5	3.5	18	8.0	4.7
D03	2.4	1.7	71	2.8	2.1
D07	2.6	1.7	65	4.9	3.3
D09	5.1	3.2	63	5.0	3.0
# D11	2.0	1.5	75	2.7	2.0
# D12	3.1	2.3	74	2.9	2.3
# D17	1.9	1.5	79	2.8	1.6
D19	3.5	2.4	69	3.1	2.3
D20	1.5	1.0	67	1.7	1.2
# D21	1.90	1.40	74	1.9	1.5
# D22	1.6	1.4	88	2.0	1.6
D23	2.7	1.9	70	2.8	1.6
# D24	-	-	-	-	-
# D25	2.4	1.7	71	2.3	1.7
D26	1.8	1.3	72	1.3	1.0

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 – December 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 ($\mu\text{g}/\text{m}^3$)
05/12/13	88.7	36.6	25.7	28.9
11/12/13	82.9	88.9	53.2	64
17/12/13	72.4	73.6	59.9	78.4
23/12/13	136	124	70.2	72.8
29/12/13	124	62.1	121	88.2
Monthly Mean	101	77	66	66
Yearly Mean	61	62	41	49

Reported yearly means are below the 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. Seven blasts were conducted during the reporting period. Monitoring at all four 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 December 2013 were within the prescribed criteria limits.

Table 5: Blast Results – December 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
05/12/13	11:23	M5WTA1	103.6	0.17	YES	104.6	0.19	YES	104.0	0.16	YES	103.0	0.36	YES
06/12/13	15:31	BS5WWA4	96.0	0.13	YES	103.6	0.59	YES	104.0	*	YES	*	*	*
11/12/13	11:56	BS5WWA5	97.2	0.12	YES	106.9	0.59	YES	107.9	0.14	YES	98.1	0.09	YES
17/12/13	09:35	M20WWA1	95.0	0.12	YES	96.1	0.14	YES	95.4	0.10	YES	103.0	0.99	YES
19/12/13	15:29	M13WTA11	95.7	0.22	YES	94.7	0.19	YES	97.9	0.17	YES	98.7	0.49	YES
23/12/13	15:30	M16WRA2	97.7	0.06	YES	99.0	0.09	YES	104.7	0.07	YES	97.4	0.40	YES
30/12/13	11:02	BS5WWA6	99.8	0.12	YES	110.0	0.72	YES	107.0	0.17	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 **$30\mu\text{g}/\text{m}^3$** for this reporting period.

Table 6
PM₁₀ Results – December 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
01/12/13	13.1	19.00	11.6	22.37	14.8	16.15	14.8	16.33
02/12/13	13.2	18.99	14.6	22.35	13.0	16.15	14.2	16.32
03/12/13	16.4	18.98	15.9	22.33	13.0	16.14	17.8	16.33
04/12/13	19.9	18.98	30.9	22.36	13.6	16.13	15.3	16.33
05/12/13	27.8	19.01	12.6	22.33	15.6	16.13	16.3	16.33
06/12/13	10.1	18.98	13.7	22.30	8.6	16.10	8.5	16.30
07/12/13	19.0	18.98	20.6	22.30	15.4	16.10	17.1	16.30
08/12/13	23.5	18.99	28.0	22.31	24.6	16.13	28.7	16.34
09/12/13	31.1	19.03	35.3	22.35	22.0	16.14	24.4	16.36
10/12/13	16.5	19.02	26.9	22.36	13.1	16.14	10.8	16.35
11/12/13	26.6	19.04	27.7	22.38	24.4	16.16	25.2	16.37
12/12/13	24.9	19.06	29.3	22.40	27.1	16.19	27.7	16.41
13/12/13	31.0	19.10	31.0	22.43	27.2	16.22	30.1	16.45
14/12/13	20.7	19.10	22.5	22.43	20.3	16.24	23.0	16.46
15/12/13	19.9	19.10	21.5	22.42	21.0	16.25	19.9	16.47
16/12/13	20.8	19.11	16.1	22.40	15.0	16.25	14.6	16.47
17/12/13	14.4	19.09	19.6	22.40	15.8	16.25	17.9	16.47
18/12/13	*	*	20.0	22.39	15.1	16.24	22.9	16.49
19/12/13	14.0	19.08	19.0	22.38	21.6	16.26	31.5	16.53
20/12/13	22.0	19.09	38.4	22.43	21.8	16.27	25.8	16.56
21/12/13	37.3	19.14	42.5	22.48	42.0	16.35	43.7	16.64
22/12/13	27.3	19.16	50.9	22.56	27.3	16.38	26.7	16.67
23/12/13	34.8	19.21	38.4	22.61	23.4	16.40	24.4	16.69
24/12/13	18.7	19.20	13.3	22.58	16.8	16.40	16.2	16.69
25/12/13	12.4	19.19	12.7	22.55	13.8	16.39	12.5	16.67
26/12/13	9.0	19.16	7.6	22.51	8.2	16.37	8.3	16.65
27/12/13	13.7	19.14	12.4	22.48	12.8	16.36	12.2	16.64
28/12/13	15.0	19.13	17.5	22.47	18.5	16.37	24.8	16.66
29/12/13	36.5	19.18	24.1	22.47	37.4	16.42	29.7	16.70
30/12/13	32.7	19.22	29.8	22.49	40.7	16.49	34.2	16.74
31/12/13	31.5	19.25	25.8	22.50	33.2	16.54	31.3	16.78

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 a power outage.

Appendix A
Wambo Weather Station
Meteorological Data

Meteorological Data December 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
01/12/13	11.3	17.7	23.7	12.5	18.3	23.8	-5.5	7.6	17.2	48.4	71.3	95.6	-1.8	248.3	1116.5	0.0	0.1	1.7	3.4
02/12/13	10.8	19.0	26.4	12.2	19.6	26.3	-3.5	7.6	21.7	37.1	66.2	95.7	-1.8	327.9	1230.4	0.0	0.1	1.7	3.3
03/12/13	11.2	20.4	29.3	12.6	21.1	29.3	-5.4	8.9	24.9	21.7	63.8	95.4	-1.8	362.2	1031.4	0.0	0.1	1.6	2.9
04/12/13	12.7	23.6	34.9	13.6	24.5	34.5	-5.8	10.9	42.2	18.8	59.6	96.5	-1.5	248.0	1061.8	0.0	0.2	2.0	3.7
05/12/13	13.2	21.0	27.3	14.1	21.5	28.4	-3.0	6.2	30.2	22.6	54.5	91.6	-1.5	213.3	1065.5	3.0	0.5	3.1	4.7
06/12/13	9.6	17.7	26.2	11.1	18.0	25.2	-18.7	3.5	27.9	19.7	45.6	75.4	-1.5	350.2	1144.8	0.0	0.4	2.3	3.2
07/12/13	8.2	18.7	27.7	9.5	19.3	27.2	-14.8	7.9	34.8	26.3	57.1	95.0	-1.8	342.7	1052.6	0.0	0.2	1.7	3.2
08/12/13	13.1	22.7	33.6	15.2	23.5	33.0	-15.6	9.8	39.9	20.1	52.5	85.7	-1.5	344.6	1011.1	0.0	0.5	1.7	3.2
09/12/13	14.2	26.3	37.0	15.5	27.1	36.0	-11.7	10.7	36.0	19.1	50.4	91.1	-1.5	256.4	1188.9	0.0	0.2	2.1	3.9
10/12/13	17.0	28.4	35.7	19.5	29.1	35.5	-6.7	8.6	57.8	17.6	39.0	61.7	-1.5	315.7	1078.5	0.0	0.1	2.8	4.2
11/12/13	15.3	24.1	32.6	17.5	24.9	32.3	-12.0	10.7	56.4	14.8	49.7	89.1	-1.5	326.9	1018.8	0.0	0.1	2.0	3.8
12/12/13	16.3	23.2	30.6	18.7	23.9	30.3	-7.5	8.6	42.7	31.1	58.4	87.6	-1.5	322.7	1026.9	0.0	0.4	2.0	3.7
13/12/13	14.6	24.7	35.2	15.8	25.1	34.5	-21.1	5.1	25.5	21.2	62.0	95.2	-1.5	319.0	963.0	0.0	0.1	1.7	3.7
14/12/13	16.8	23.0	30.3	18.4	23.6	29.9	-7.9	8.0	28.6	39.6	67.5	93.0	-1.5	203.0	1029.2	0.0	0.0	1.9	4.1
15/12/13	16.1	22.0	28.7	17.7	22.4	28.2	-6.6	4.8	20.0	46.8	67.8	90.0	-1.5	229.2	1224.0	0.0	0.4	2.2	3.6
16/12/13	18.3	22.5	28.4	19.0	22.8	28.0	-7.4	3.9	9.4	45.7	68.1	87.1	-1.5	262.8	1111.6	0.0	1.5	2.5	3.9
17/12/13	15.3	22.7	29.9	16.6	23.1	29.7	-8.4	4.9	17.8	32.4	63.9	92.4	-1.5	310.8	1099.7	0.0	0.2	1.9	3.3
18/12/13	15.2	22.4	29.2	16.4	22.8	28.9	-6.6	5.2	20.5	37.3	64.2	93.2	-1.5	336.0	992.7	0.0	0.2	2.1	3.6
19/12/13	13.0	23.7	34.8	14.8	24.4	33.9	-12.7	8.7	29.7	22.0	59.6	94.2	-1.5	342.3	973.2	0.0	0.1	1.6	2.9
20/12/13	16.1	28.6	40.2	17.2	29.3	39.3	-19.7	8.5	38.8	17.5	48.6	93.9	-1.5	316.6	943.0	0.0	0.1	2.0	3.8
21/12/13	21.4	26.8	33.2	23.3	27.5	32.8	-8.3	9.3	52.7	39.3	60.1	80.1	-1.5	285.7	903.4	0.0	0.0	2.3	3.8
22/12/13	21.9	29.6	40.4	22.3	30.0	39.8	-12.0	4.7	38.5	18.6	53.2	86.3	-1.5	244.9	986.3	0.0	0.2	1.9	3.5
23/12/13	20.0	30.6	38.3	21.7	31.6	38.0	-5.7	12.6	63.5	21.7	39.2	84.0	-1.5	132.1	737.5	0.0	0.2	2.7	4.4
24/12/13	18.7	20.8	25.7	19.1	21.3	26.3	1.1	5.5	8.4	66.7	81.4	95.3	-1.5	34.8	184.1	2.5	1.3	2.1	3.0
25/12/13	18.6	20.1	21.5	19.1	20.6	21.9	2.8	6.1	9.3	79.3	88.1	96.5	-1.5	37.9	226.5	8.3	0.2	1.5	2.5
26/12/13	19.1	23.3	30.1	20.0	23.6	30.1	-5.8	4.6	11.9	40.4	74.0	96.6	-1.5	260.4	1079.2	1.1	0.3	2.1	3.5
27/12/13	15.1	21.8	29.2	16.5	22.2	29.0	-6.0	5.4	18.5	45.5	72.2	96.0	-1.5	283.6	1004.9	0.2	0.3	2.0	3.6
28/12/13	18.1	24.2	32.9	19.0	24.6	32.4	-13.3	5.3	19.8	35.5	67.8	86.8	-1.5	267.2	1116.3	0.0	0.0	1.7	2.6
29/12/13	16.5	22.5	29.4	17.6	22.9	29.5	-8.2	5.6	22.7	37.2	66.1	96.6	-1.5	329.1	998.1	0.0	0.2	2.6	4.1
30/12/13	13.4	21.0	28.3	15.2	21.4	28.0	-11.1	5.1	23.5	39.5	61.3	90.5	-1.6	322.3	994.6	0.0	0.2	2.0	3.2
31/12/13	12.5	22.7	34.4	13.8	23.1	33.6	-17.2	5.3	29.1	23.0	63.0	94.5	-1.6	317.3	1073.2	0.0	0.3	2.0	4.0
MONTH	8.2	23.1	40.4	9.5	23.7	39.8	-21.1	7.1	63.5	14.8	61.2	96.6	-1.8	274.0	1,230.4	15.0	0.0	2.1	4.7