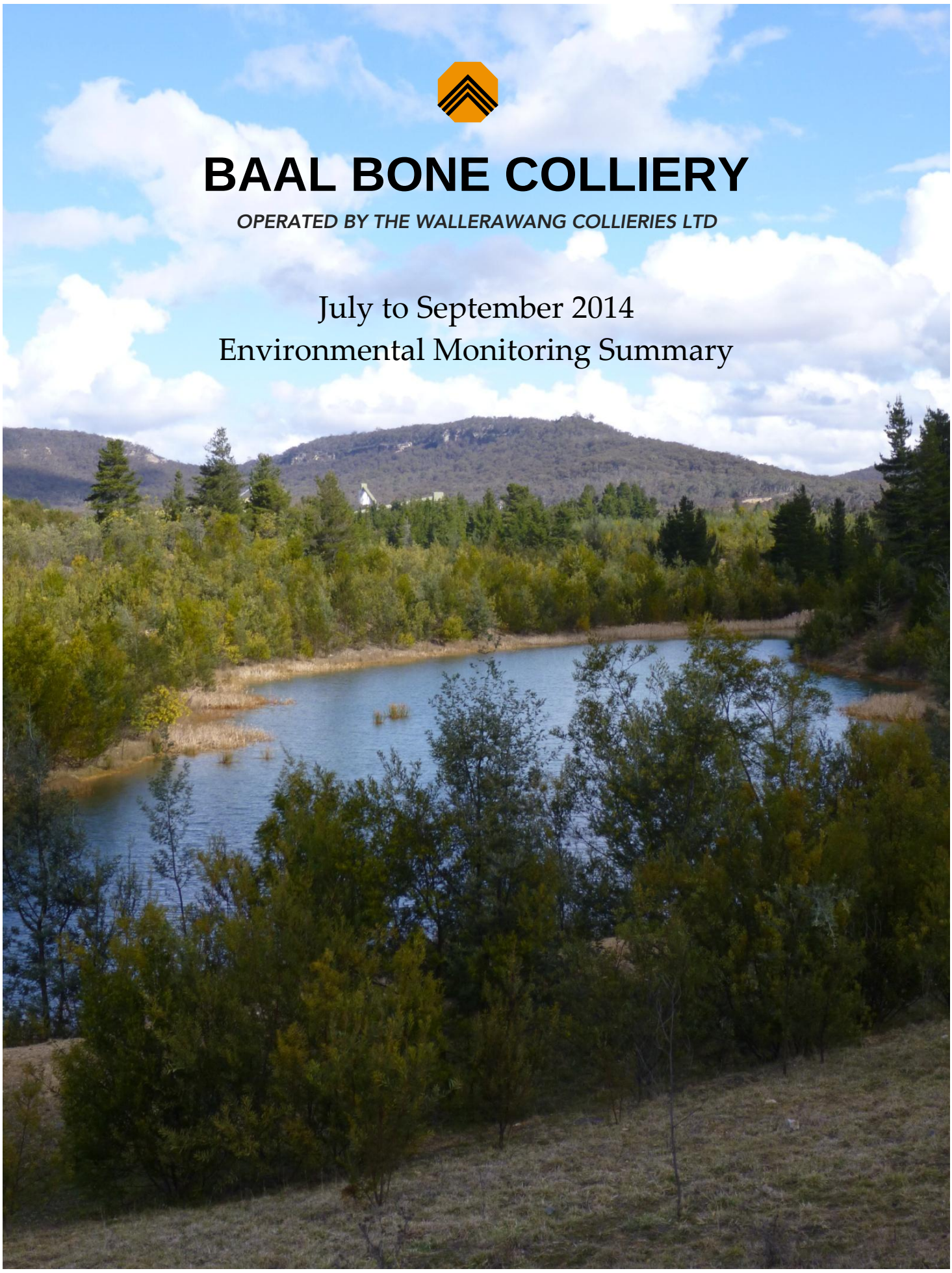
GLENCORE

BAAL BONE COLLIERY

OPERATED BY THE WALLERAWANG COLLIERIES LTD

July to September 2014
Environmental Monitoring Summary



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1.Introduction

In accordance with Schedule 5, Condition 9 of Project Approval 09_0178 this report provides a summary of environmental monitoring results for Baal Bone Colliery, for the period **1 July to 30 September 2014**. Baal Bone's licensed discharge and monitoring locations are identified in **Drawing 1**. Noise monitoring locations are identified in **Drawing 2**. Results included in this summary include – air quality, surface water quality and dewatering bore flow rates.

2. Air Quality

In accordance with Schedule 3, Condition 12 of Project Approval 09_0178 Baal Bone Colliery has developed an Air Quality Monitoring Program (AQMP). The Department of Planning (DOP) approved the AQMP in correspondence dated 6 July 2011.

Monthly dust fall-out monitoring is carried out in accordance with Australian Standard AS3580.10.1, EPL requirements and Baal Bone's AQMP. Baal Bone has engaged ALS Group Environmental Division Mudgee, a NATA Accredited laboratory, to undertake monthly sampling, monitoring and analysis.

Up until 11 February 2014, Baal Bone maintained a network of five dust deposition gauges to monitor dust levels around site and in the vicinity of the nearest neighbour, these were:

- Sample location DM1 (EPL monitoring point No. 7);
- Sample location DM2 (EPL monitoring point No. 13);
- Sample location DM3 (EPL monitoring point No. 14); and
- Sample location DM4 (EPL monitoring point No. 15).
- Sample location DM5 – installed 8 September 2011 (EPL monitoring point No. 16).

On November 2013, Baal Bone Colliery requested permission to remove sample location DM5 from the sampling regime. The basis for the request was due to the ongoing issues the laboratory had with gaining access to the monitor located on adjoining private land. A review of the monitoring data for DM5 indicated no exceedance at this site since its inception in September 2011.

Approval to remove DM5 from the EPL was granted by the EPA on the 11th February 2014. From February onwards, DM5 will no longer be sampled and reported on.

Particulate matter less than 10 μm in size (PM10) and high volume air sampler total suspended particulate (TSP) monitors were installed 23 October 2011 and 29 October 2011 respectively in accordance with a revised AQMP which was approved by the Department of Planning and Infrastructure in accordance with Project Approval 09_0178. The location of the TSP and PM10 monitors are situated at the same location as DM2.

In accordance with the AQMP, monitoring for PM10 and TSP was discontinued in June 2012. The monitoring was discontinued following Baal Bone mining operations entering care and maintenance in September 2011, and the completion of washing and transporting of coal off-site in December 2011 and April 2012 respectively.

Locations of all air quality monitoring gauges are shown in **Drawing 1**.

AIR QUALITY IMPACT ASSESSMENT CRITERIA

Schedule 3, Condition 10 of Project Approval 09_0178 includes air quality impact assessment criteria for the project which are summarised in **Table 2.1** below. The pollutants to be monitored include deposited dust, TSP and PM10.

Table 2.1: Baal Bone Air Quality Impact Assessment Criteria

Pollutant	Averaging period	Criterion	
Deposited dust	Annual	Maximum increase	Maximum total
		2 g/m^2/month	4 g/m^2/month
TSP	Annual	90 μg/m^3	
PM^{10}	24 hour	50 μg/m^3	
	Annual	30 μg/m^3	

DEPOSITIONAL DUST MONITORING RESULTS

Levels of deposited dust at Baal Bone's five gauges were below 4g/m²/month during the reporting period (refer to **Table 2.2**). Dust levels at all five gauges satisfied the criterion outlined in Project Approval 09_0178.

Figures 2.1 to 2.5 provide monthly results for each depositional dust gauge for 2014.

Table 2.2: Deposited dust monitoring results for 2014 to date (g/m²/month)

Month	DM1	DM2	DM3	DM4	DM5
January	0.6	0.5	1.2	1.1	0.4
February	0.5	0.3	0.4	0.4	0.7
March	1.1	0.4	0.6	0.5	Removed from EPL 11/2/14
April	0.7	<0.1	0.1	<0.1	-
May	0.3	0.3	0.1	<0.1	-
June	<0.1	0.1	<0.1	0.2	-
July	0.2	0.1	0.3	0.2	-
August	0.3	0.1	0.2	0.1	-
September	1.8	<0.1	0.1	0.1	-

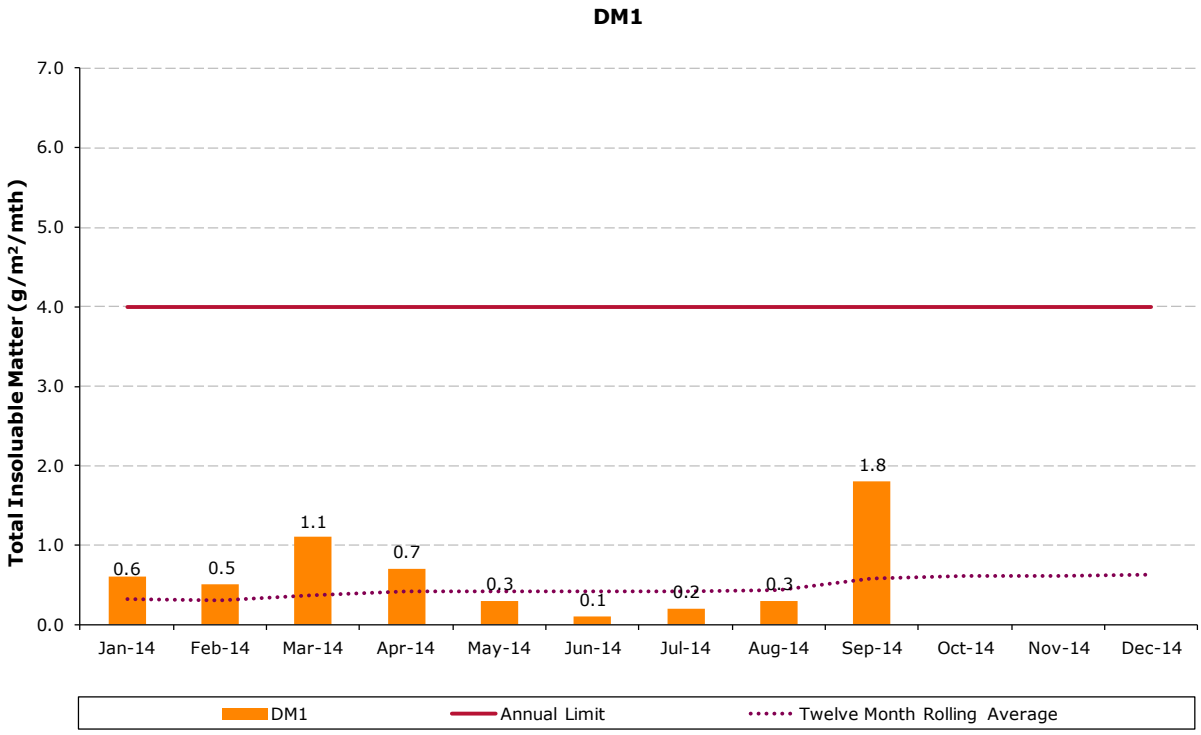


Figure 2.1: Dust monitoring gauge DM1 (EPL monitoring point No. 7)

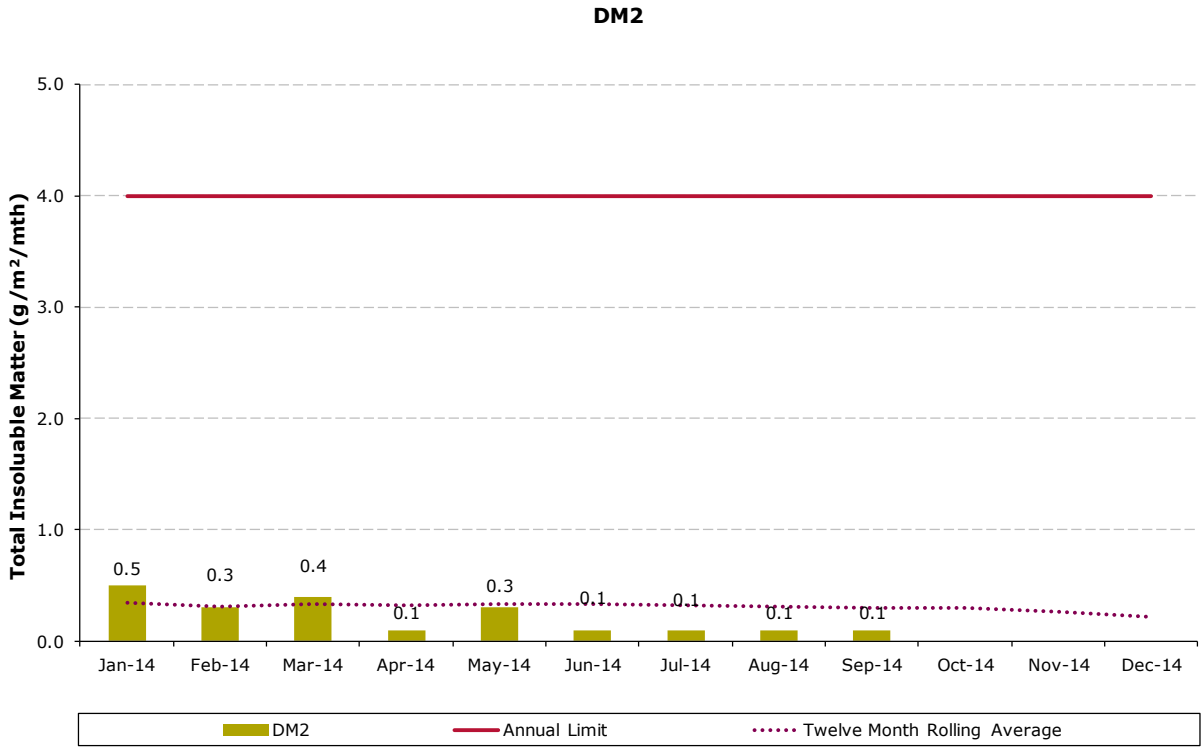


Figure 2.2: Dust monitoring gauge DM2 (EPL monitoring point No. 13)

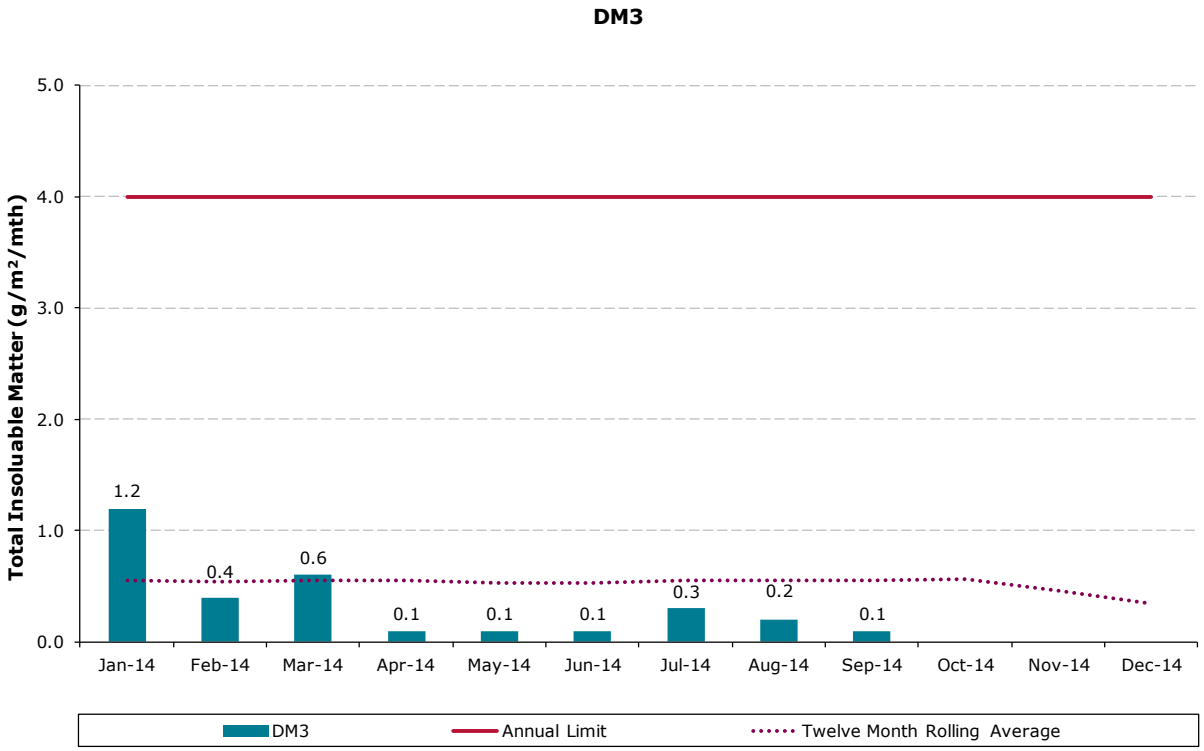


Figure 2.3: Dust monitoring gauge DM3 (EPL monitoring point No. 14)

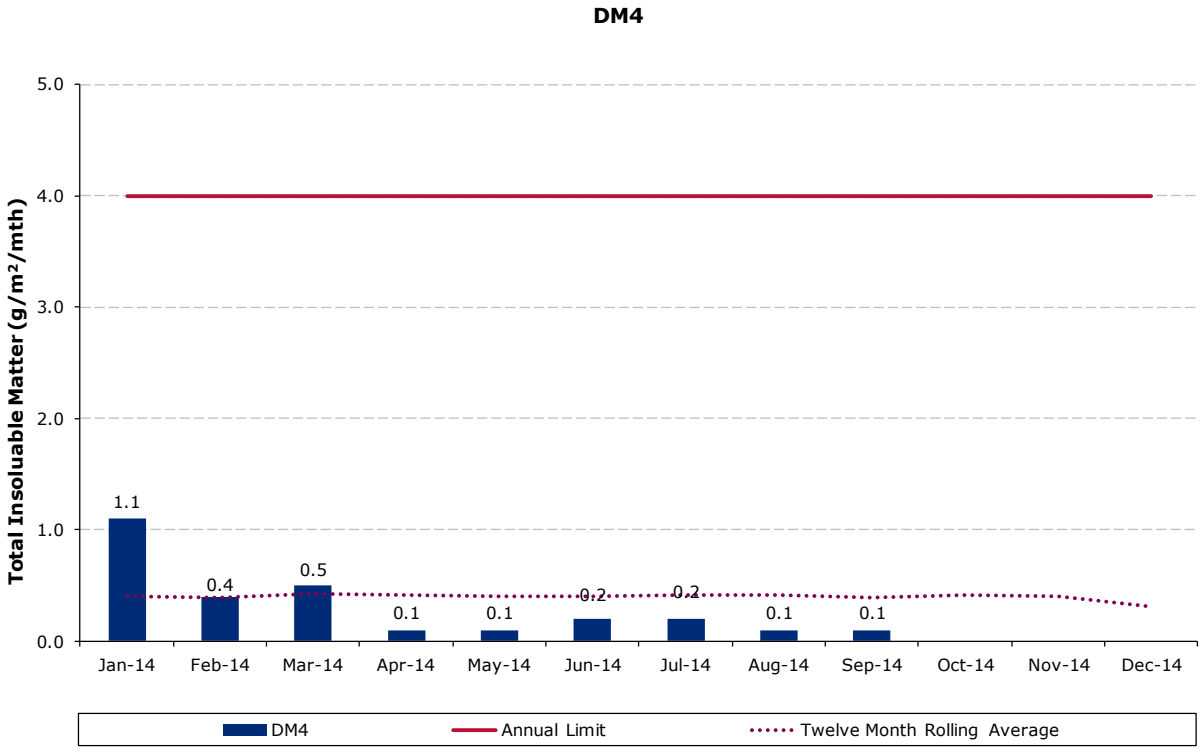


Figure 2.4: Dust monitoring gauge DM4 (EPL monitoring point No. 15)

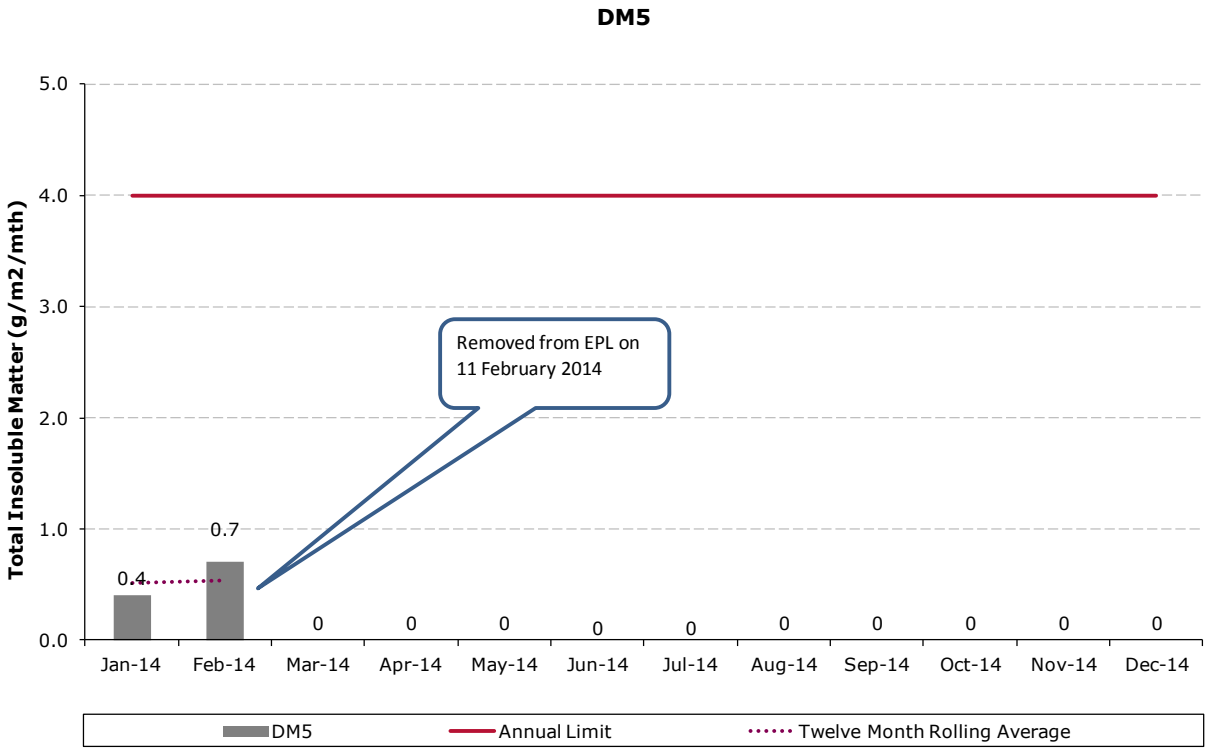


Figure 2.5: Dust monitoring gauge DM5 (*Previous* EPL monitoring point No. 16)

TOTAL SUSPENDED PARTICULATE RESULTS

A high volume air sampler (HVAS) was installed in October 2011 to monitor total suspended particulates (TSP) at one location: DM2. The HVAS ran on a six-day cycle in accordance with EPA/OEH requirements.

In accordance with the DoPI approved Air Quality Monitoring Program, monitoring for TSP was discontinued in June 2012. The monitoring was discontinued following Baal Bone mining operations entering care and maintenance in September 2011, and the completion of coal washing and transporting of coal off-site in December 2011 and April 2012 respectively.

PM_{10} RESULTS

A Tapered Element Oscillating Microbalance Analyser (TEOM) was installed in October 2011 to measure particulate matter up to 10 microns in diameter (PM_{10}) at one location: DM2.

In accordance with the DoPI approved Air Quality Monitoring Program, monitoring for PM_{10} was discontinued in June 2012. The monitoring was discontinued following Baal Bone mining operations entering care and maintenance in September 2011, and the completion of washing and transporting of coal off-site in December 2011 and April 2012 respectively.

3. Surface Water

Baal Bone has engaged ALS Group Environmental Division Mudgee, a NATA Accredited laboratory, to undertake monthly sampling, monitoring and analysis of a range of surface and subsurface waters.

Until 31st July 2013, Baal Bone maintained a network of five licensed discharge and monitoring points in accordance with EPL 765 (viz. LD2, LD3, LD6, LDP1 and WMP1)(**Drawing 1**). On 31st July 2013 both LDP03 and LDP06 (north and south boreholes) were relinquished. Mine water is now pumped back to the Baal Bone pit top and is managed through the site's water management system and discharged through LDP01

A copy of EPL 765 can be accessed here: http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=33540&SYSUID=1&LICID=765.

WATER QUALITY CONCENTRATION LIMITS

Condition L2 of EPL 765 outlines water concentration limits for oil and grease, pH, total suspended solids and total iron. These limits are presented below in **Table 3.1.**

Table 3.1: EPL concentration limits

	LD2	LDP1	WMP1
Oil and grease (mg/L)	-	10	-
pH	-	6.5-8.5	-
Total Suspended Solids (mg/L)	-	50	-
Total Iron (mg/L)	-	1.0	-

WATER QUALITY RESULTS

Monitoring results for Baal Bone's three licensed discharge and monitoring points as required by EPL 765 are presented below in **Table 3.2**.

Table 3.2: EPL Water quality results for the reporting period 2014

EPL Point	Month	EC uS/cm	O&G mg/L	SO_4^{2-} mg/L	Fe mg/L	TSS mg/L	pH	BOD mg/L	Faecal Coliforms cos/100mls	N mg/L	P mg/L
LD2[a]	Jan	-	-	-	-	-	-	-	-	-	-
	Feb	-	-	-	-	-	-	-	-	-	-
	Mar	-	-	-	-	-	-	-	-	-	-
	Apr	-	-	-	-	-	-	-	-	-	-
	May	-	-	-	-	-	-	-	-	-	-
	June	-	-	-	-	-	-	-	-	-	-
	July	-	-	-	-	-	-	-	-	-	-
	Aug	-	<5	-	-	19	6.7	3	30	4.8	0.46
	Sept	-	<5	-	-	67	7.2	34	2	6.5	3.65
LDP1	Jan	1320	<5	343	1.11	2	8	-	-	-	-
	Feb	1300	<5	340	0.12	5	8.1	-	-	-	-
	Mar	1300	<5	336	0.21	3	8.2	-	-	-	-

	Apr	1270	<5	315	0.74	3	7.9	-	-	-	-
	May	1350	<5	386	0.26	<2	8.1	-	-	-	-
	June	1340	<5	326	0.32	<2	7.8	-	-	-	-
	July	1290	<5	322	0.22	<2	8.0	-	-	-	-
	Aug	1270	<5	340	0.22	<2	7.9	-	-	-	-
	Sept	1200	<5	335	0.25	<2	7.9	-	-	-	-
WMP 1[b]	Jan	-	-	-	-	-	-	-	-	-	-
	Feb	-	-	-	-	-	-	-	-	-	-
	Mar	-	-	-	-	-	-	-	-	-	-
	Apr	-	-	-	-	-	-	-	-	-	-
	May	-	-	-	-	-	-	-	-	-	-
	June	-	-	-	-	-	-	-	-	-	-
	July	-	-	-	-	-	-	-	-	-	-
	Aug	-	-	-	-	-	-	-	-	-	-
	Sept	-	-	-	-	-	-	-	-	-	-

Notes

(a) No samples taken at LD2 between January and July 2014 as sample location was dry

(b) No samples taken at WMP1 during 2014 to date as no flow at sample location

Legend

BOD = Biological oxygen demand

EC = Electrical conductivity

Fe = Iron

N = Nitrogen

O & G = Oil and Grease

P = Phosphorus

SO_4^{2-} = Sulfate

TSS = Total suspended solids

Highlighted cells = Results exceed EPL concentration limits

Figures 3.1 to 3.4 provide monthly water quality results compared to EPL concentration limits.

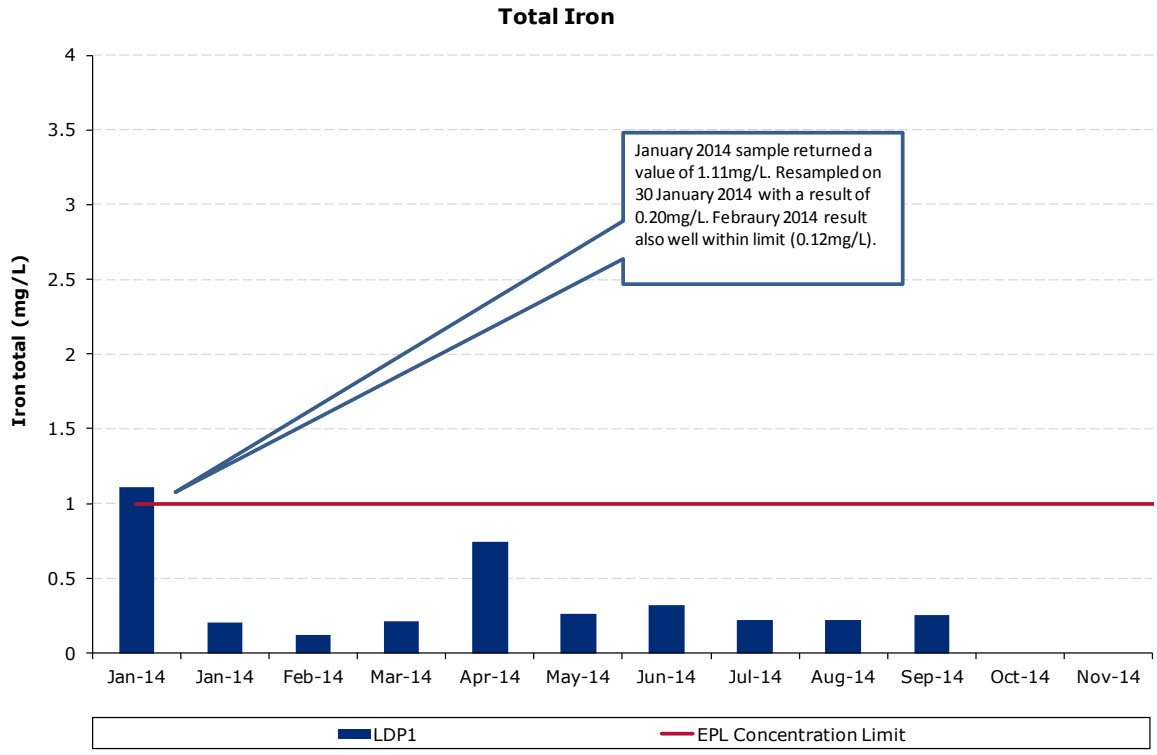
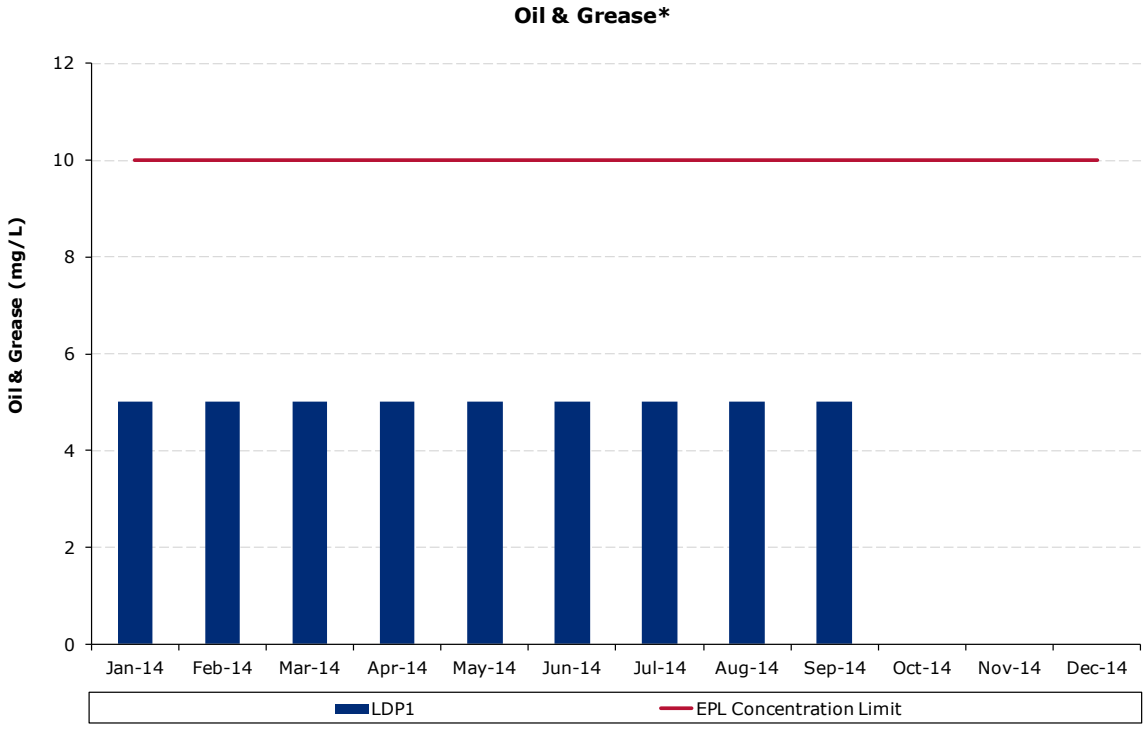


Figure 3.1: Total iron levels



Notes:
* Some values shown as 5 were reported as being <5 (Refer to Table 3.2).

Figure 3.2: Oil and grease levels

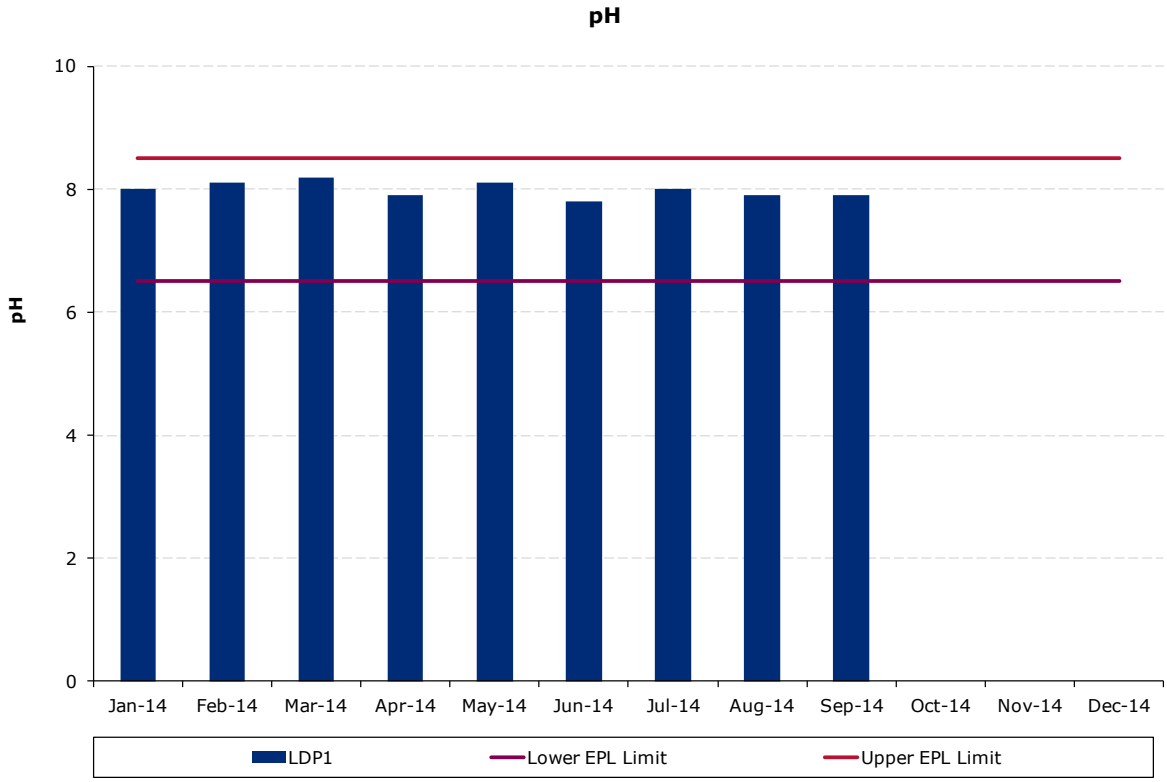
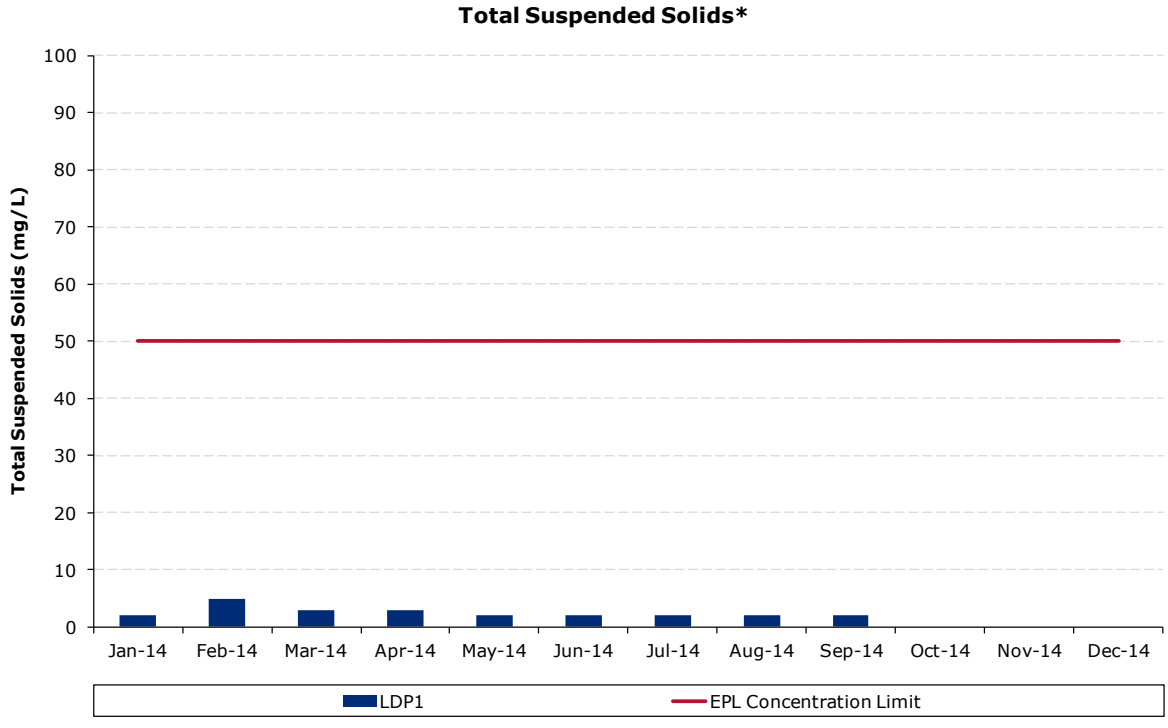


Figure 3.3: pH levels



Notes:
* Some values shown as 2 were reported as being <2 (Refer to Table 3.2).

Figure 3.4: Total suspended solids levels

All samples recorded were within EPL concentration limits during the reporting period.

January 2014 Iron Limit Exceedance

- Total iron during January at LDP01was sampled at 1.11mg/L (EPL limit 1mg/L) on the 17/01/14. Total iron across all surface monitoring sites sampled during January returned results higher then 1mg/L when results across these monitoring sites had historically had iron levels well below the limit of 1mg/L.
- Upon notification of the high iron results, sites across the pit top were re-sampled for iron on 30/01/2014. Results received back from these sites showed a return to expected iron levels with iron at LDP01 measured at 0.20mg/L.
- Due to the return to expected and historical results during the sampling on 30/1/2014 and no anomalies occurring for high iron at any of the surface monitoring sites since, it is assumed the results were cause by sampling or laboratory error.

Monthly EPL reporting can be accessed here:
http://glencorecoal.com.au/EN/Operations/Baalbone/Pages/EPLreportingBaalBone.aspx

4. Groundwater

Discharges of mine water previously occurred via Licence Discharge Points LDP3 and LDP6 located over the mining lease area. EPL 765 specified discharge limits on LDP6 whilst these discharge points were in place.

As of 31st July 2013, both LDP3 and LDP6 were relinquished and no requirement for daily discharges exists from this date.

5. Noise

Baal Bone Colliery has developed a Noise Management Plan (NMP) in accordance with Schedule 3, Condition 6 of Project Approval 09_0178. The NMP was approved by the Department of Planning in correspondence dated 11 November 2011.

After entering Care & Maintenance approval was sought from DOP to carry out annual noise monitoring surveys in place of quarterly surveys.

As per the NMP Baal Bone Colliery operates a real time noise monitor at location R2. In addition to real time noise monitoring (which is supplementary to regulatory measurements), from 2013 onwards attended monitoring is undertaken on an annual basis at receptors R1 and R2/R3 (**refer to Drawing 2**).

Noise Impact Assessment Criteria

Schedule 3, Condition 4 of Project Approval 09_0178 includes long term noise impact assessment criteria. Table 5.1 outlines the assessment criteria.

Table 5.1: Long term noise impact assessment criteria

Location	All periods dB(a) $L_{Aeq(15\ min)}$	Night dB(a) $L_{A1(1\ min)}$
R1	46	47
R2	41	48
R3	41	48
All other privately-owned land	35	45

NOISE AUDIT RESULTS

Atkins Acoustics carried out a environmental compliance noise audit at Baal Bone Colliery on Wednesday 23 July 2014 between 2.00pm and 11.30pm.

Table 5.2 summarises the results from the audit.

Table 5.2: Noise Audit Summary

Location (Start time)	Measured Predicted Colliery Noise L_{Aeq}	Limit	Unit	Comments
Daytime Audit (1350-1505) – Wednesday 23rd July 2014				
Location R1 (1430 hours)	<30	46	dBA	Dozer reversing alarm<30dBA; Mine ventilation fan <25dBA; Domestic activities 34/5dBA; Dist road traffic 29/30dBA
Location R1 (1445 hours)	<30	46	dBA	Mine ventilation fan <25dBA; Dogs 34/6dBA; Plane 41/5dBA; Domestic activities 34/7dBA; Dist road traffic 35/8dBA
Location R2/3 (1350 hours)	<30	41	dBA	Breeze in trees, Distant road traffic, ducks
Location R2/3 (1406 hours)	<30	41	dBA	Breeze in trees, Distant road traffic, insects, birds

Location (Start time)	Measured Predicted Colliery Noise L_{Aeq}	Limit	Unit	Comments
Evening Audit (2000 to 2130) - Wednesday 23rd July 2014				
Location R1 (2000 hours)	<30	46	dBA	Mine ventilation fan <25dBA; Domestic activities 34/5dBA; Dist road traffic 29/30dBA
Location R1 (2016 hours)	<30	46	dBA	Mine ventilation fan <25dBA; Dist road traffic 36/8dBA
Location R2/3 (2046 hours)	<30	41	dBA	Mine ventilation fan <25dBA; Dist road traffic 32/5dBA
Location R2/3 (2106 hours)	<30	41	dBA	Mine ventilation fan <25dBA; Dist road traffic 30/4dBA

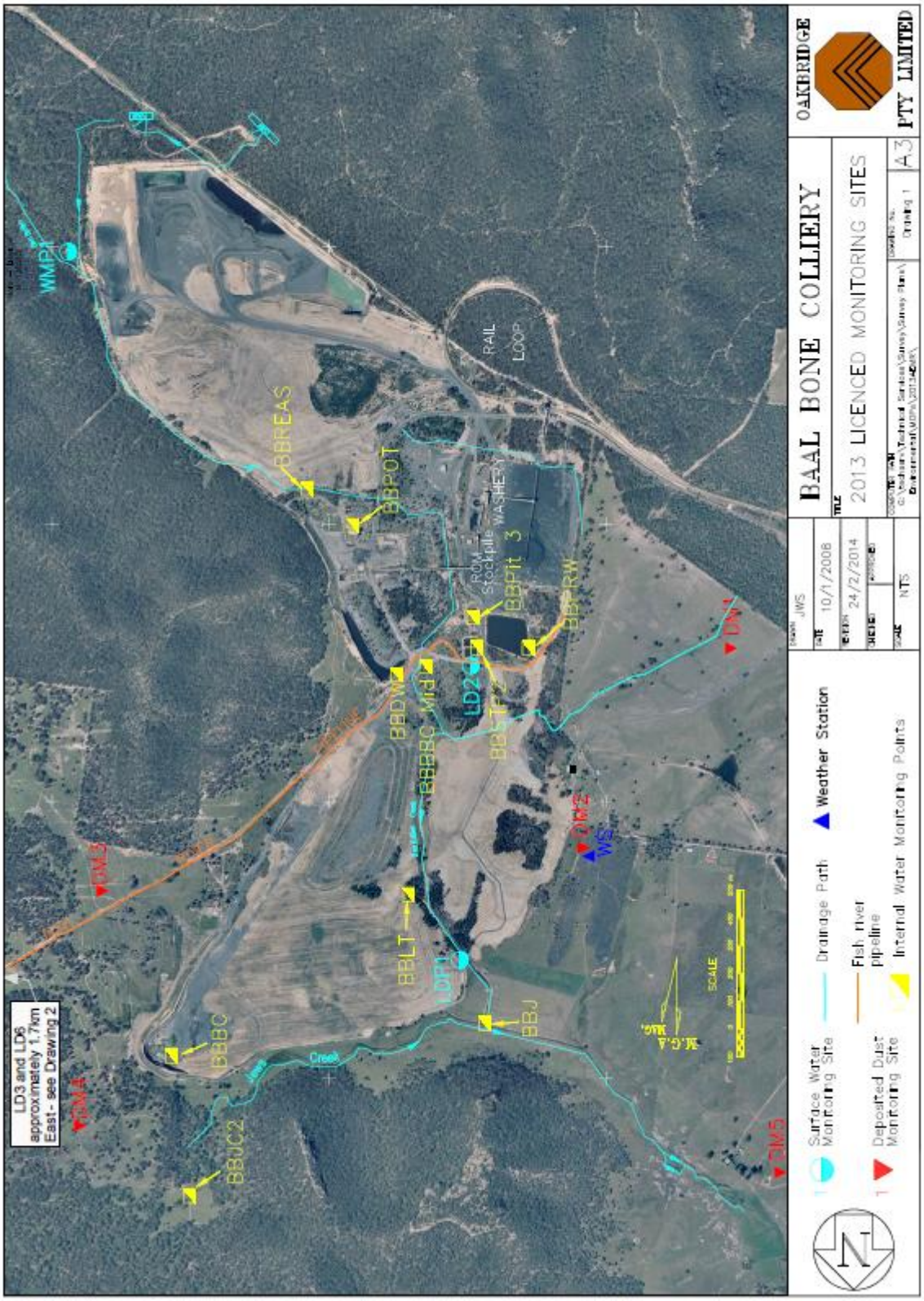
Location (Start time)	Measured Predicted Colliery Noise L_{Aeq}	Limit	Unit	Comments
Night Audit (2200 to 2330) - Wednesday 23rd July 2014				
Location R1 (2210 hours)	<30	46	dBA	Mine ventilation fan <30dBA; Intermittent highway traffic; insects.
Location R1 (2225 hours)	<35	46	dBA	Mine ventilation fan <30dBA; Intermittent highway traffic; insects.
Location R2/3 (2248 hours)	<30	48	dBA	Mine ventilation fan <30dBA; Intermittent highway traffic; insects.
Location R2/3 (2303 hours)	<30	48	dBA	Mine ventilation fan <30dBA; Intermittent highway traffic; insects.

The audit report concluded that:

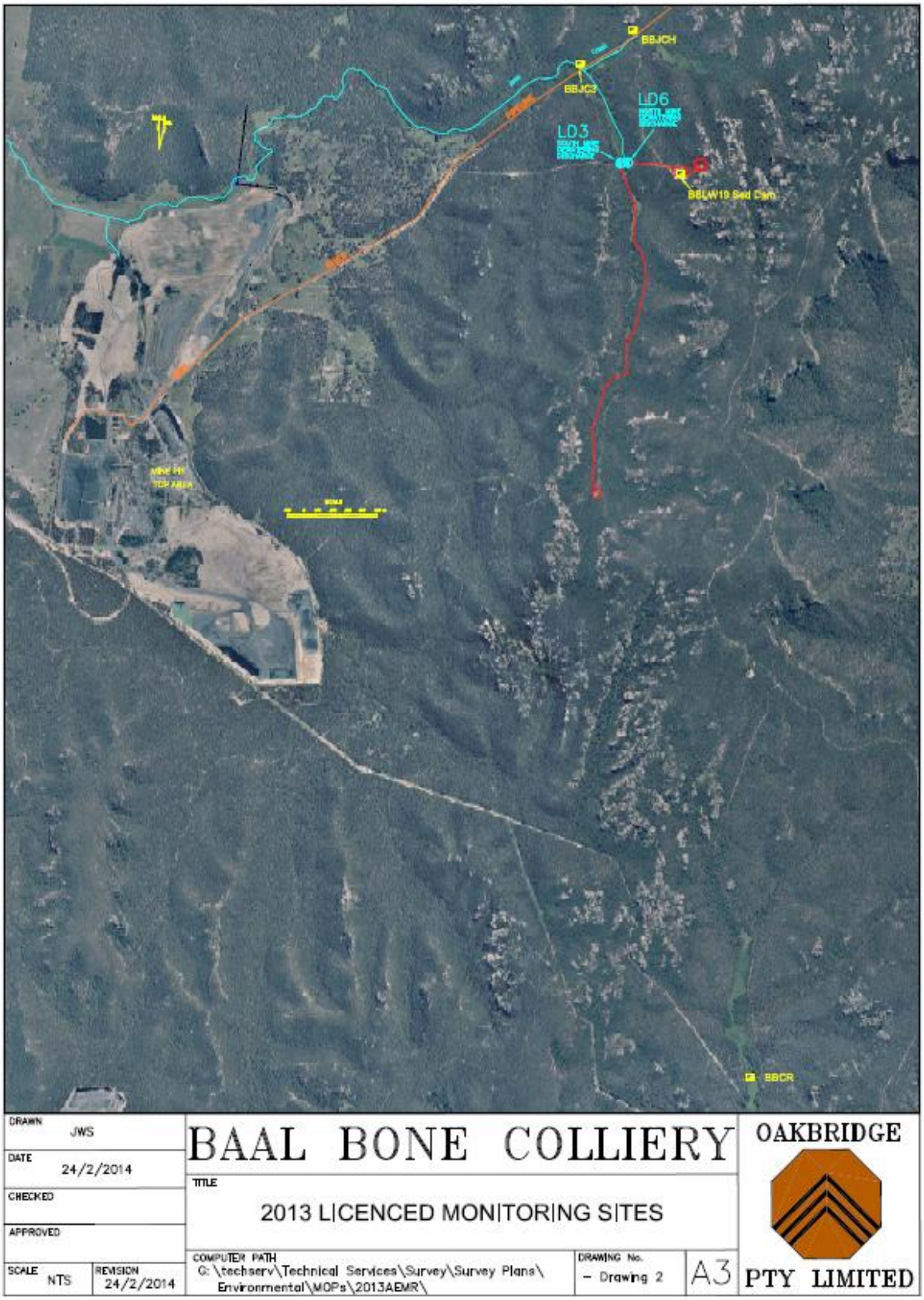
> *"During the site-attended audits noise from activities associated with BBC would not be described as tonal, impulsive, irregularity or with low frequency content. Accordingly no 'modifying factor' corrections are required to satisfy EPL 765 (L4.7). From the audit measurements and assessment, the LAeq, 15 min noise contributions from BBC during the day, evening and night assessment periods satisfied the long-term licence noise limits.*
>
> *BBC related LAmax noise levels were not observed to cause exceedances of the licence noise limits at measurement locations for the duration of the audit."*

The full July 2014 audit report and previous noise audit reports can be accessed from the Baal Bone publications page at: http://glencorecoal.com.au/EN/Operations/Baalbone/Pages/BaalBonePublicationsArchive.aspx.

Drawing 1


BAAL BONE COLLIERY
2013 LICENCED MONITORING SITES
OAKBRIDGE PTY LIMITED
A3
Drawing 1
Surface Water Monitoring Site
Drainage Path
Weather Station
Fish river pipeline
Deposited Dust Monitoring Site
Internal Water Monitoring Points
LD3 and LD6 approximately 1.7km East - see Drawing 2
WMPT
BBREAS
BBPOT
BBPit 3
BBRW
BBDW
BBBBC Mid
LD2
LD1
BBLT
BBJ
BBBC
BBJC2
DM1
DM2
DM3
DM4
DM5
WS
RAIL LOOP
ROM Stockpile
WASHERY
SCALE
M.G.A. Mga

Drawing 2



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CHECKED		
APPROVED		
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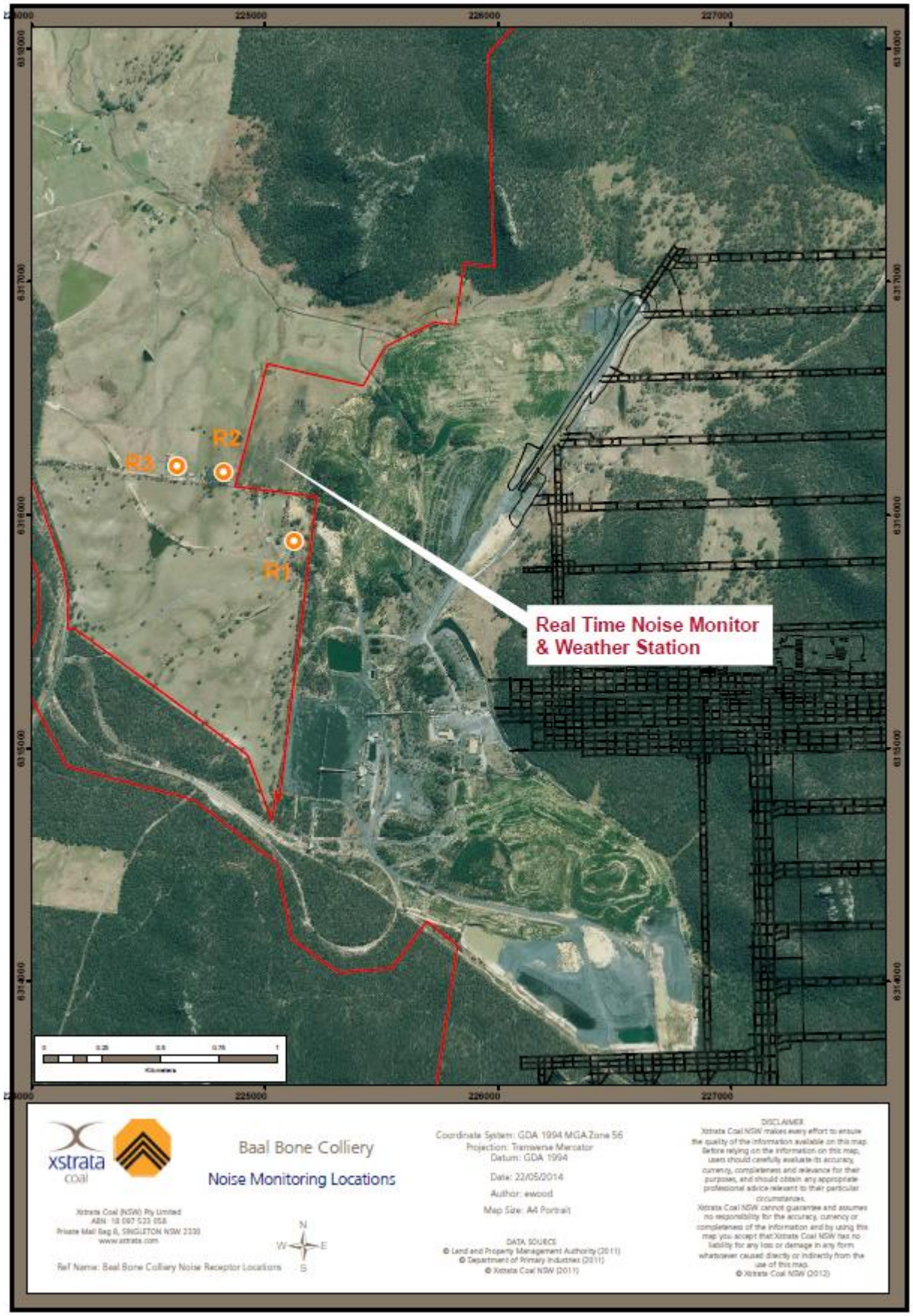
PTY LIMITED

Drawing 3


225000
226000
227000
R2
R3
R1
Real Time Noise Monitor
& Weather Station
xstrata
coal
Baal Bone Colliery
Noise Monitoring Locations
Coordinate System: GDA 1994 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 1994
Date: 22/05/2014
Author: ewood
Map Size: A4 Portrait
DISCLAIMER
DATA SOURCE
Ref Name: Baal Bone Colliery Noise Receptor Locations