

# GLENCORE



## **BAAL BONE COLLIERY**

*OPERATED BY THE WALLERAWANG COLLIERIES LTD*

January to March 2014  
Environmental Monitoring Summary



# Table of Contents

1. Introduction	3
2. Air quality	3
Air Quality Impact Assessment Criteria	4
Depositional Dust Monitoring Results	4
Total Suspended Particulate Results	7
PM <sub>10</sub> Results	7
3. Surface Water	7
Water Quality Concentration Limits	7
Water Quality Results	8
4. Groundwater	12
5. Noise	12
Noise Audit Results	

# GLENCORE

## 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 January 2014 to 31 March 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 11<sup>th</sup> 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.

# GLENCORE

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	
		Maximum increase	Maximum total
Deposited dust	Annual	2 g/m <sup>2</sup> /month	4 g/m <sup>2</sup> /month
TSP	Annual	90 µg/m <sup>3</sup>	
PM <sup>10</sup>	24 hour	50 µg/m <sup>3</sup>	
	Annual	30 µg/m <sup>3</sup>	

## Depositional Dust Monitoring Results

Levels of deposited dust at Baal Bone's five gauges were below 4g/m<sup>2</sup>/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 2013 (g/m<sup>2</sup>/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					-
May					-
June					-
July					-
August					-
September					-
October					-
November					-
December					-

# GLENCORE

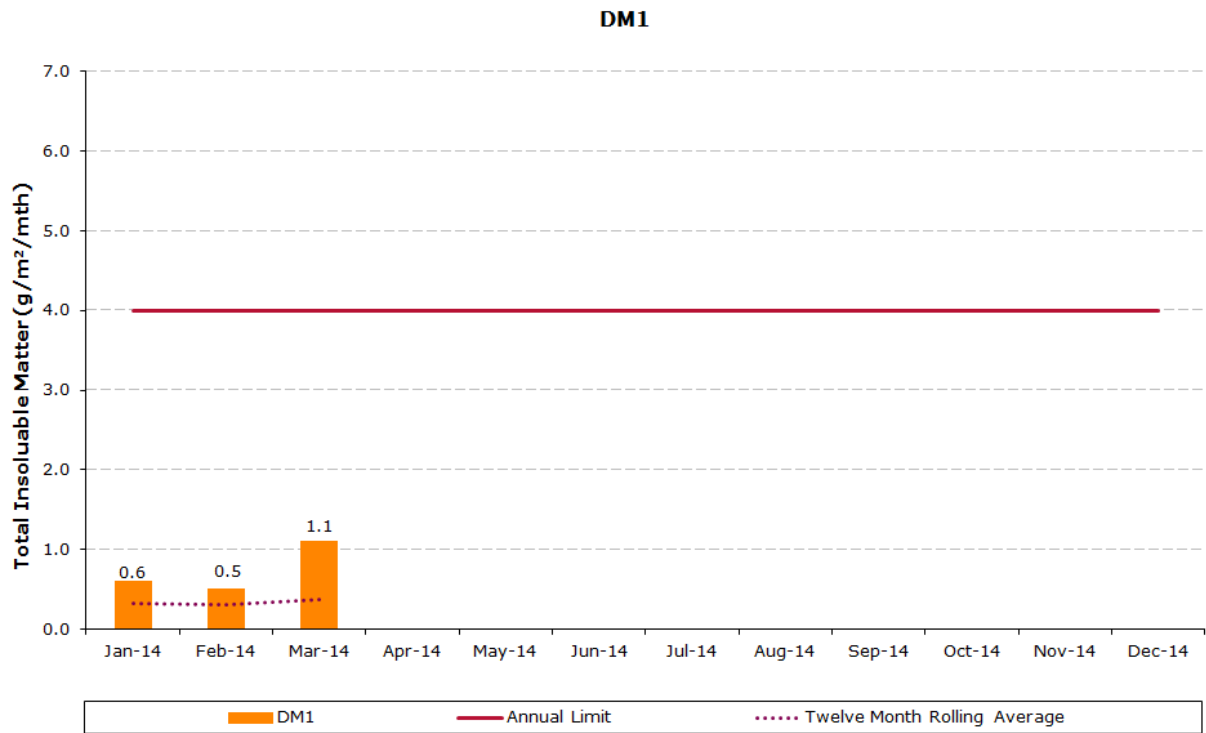


Figure 2.1: Dust monitoring gauge DM1 (EPL monitoring point No. 7)

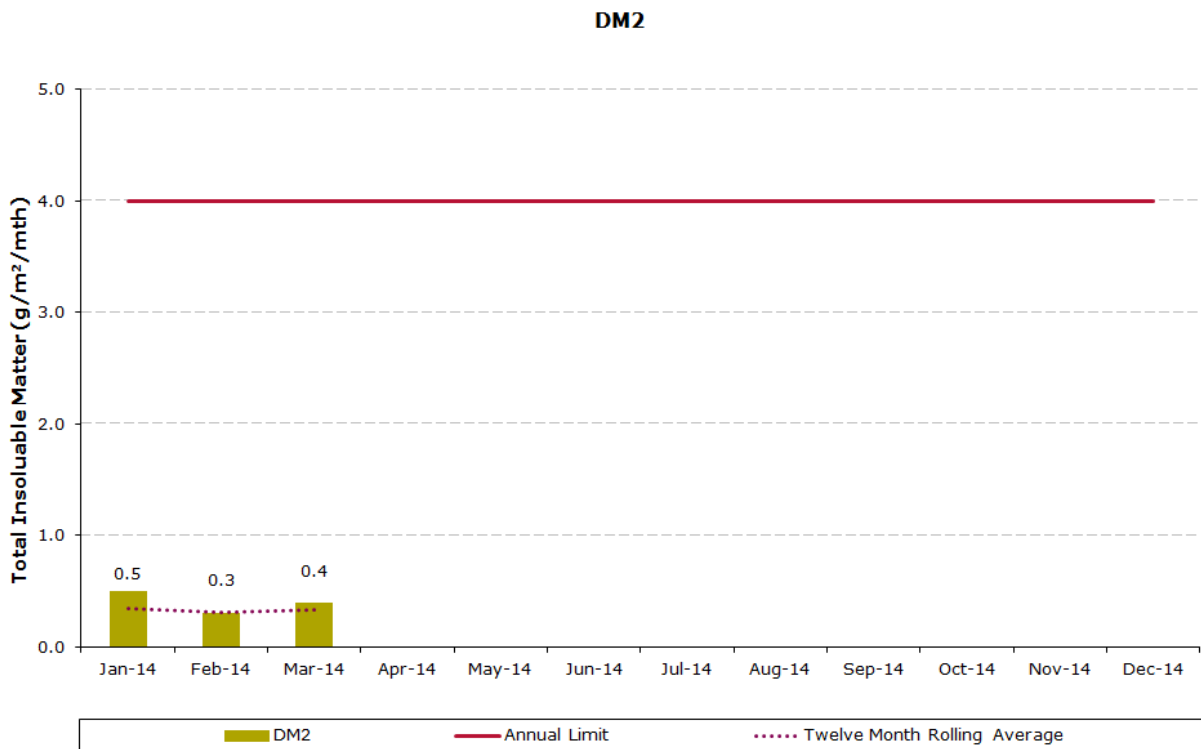


Figure 2.2: Dust monitoring gauge DM2 (EPL monitoring point No. 13)

# GLENCORE

## DM3

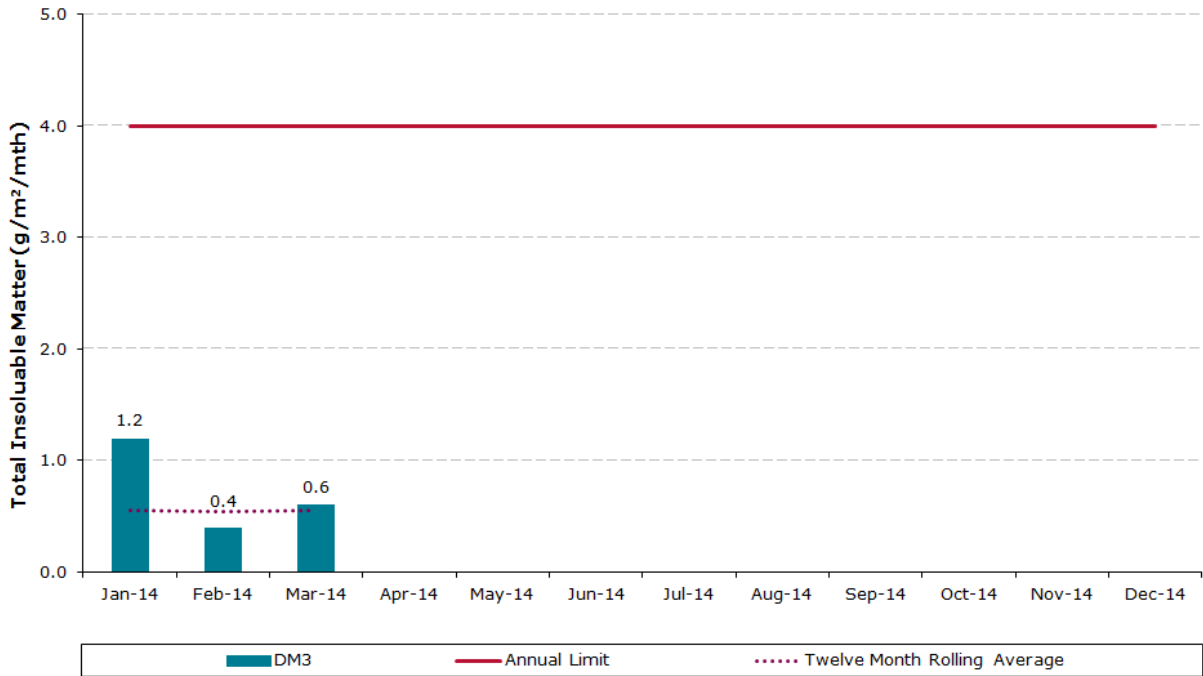


Figure 2.3: Dust monitoring gauge DM3 (EPL monitoring point No. 14)

## DM4

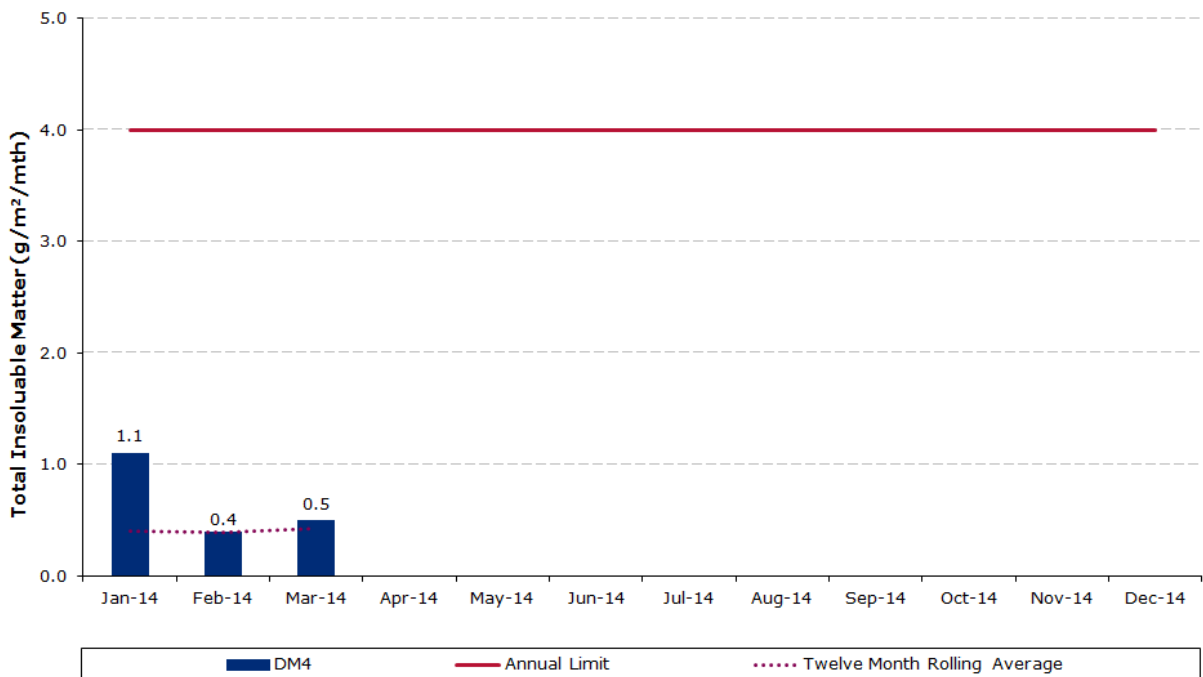


Figure 2.4: Dust monitoring gauge DM4 (EPL monitoring point No. 15)

# GLENCORE

## 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<sub>10</sub> Results

A Tapered Element Oscillating Microbalance Analyser (TEOM) was installed in October 2011 to measure particulate matter up to 10 microns in diameter (PM<sub>10</sub>) at one location: DM2.

In accordance with the DoPI approved Air Quality Monitoring Program, monitoring for PM<sub>10</sub> 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 31<sup>st</sup> 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 31<sup>st</sup> 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.environment.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=32193&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	LD3	LD6	LDP1	WMP1
Oil and grease (mg/L)	-	10	10	10	-
pH	-	6.5-8.5	6.5-8.5	6.5-8.5	-





# GLENCORE

	Dec										
WMP 1 <sup>b</sup>	Jan	-	-	-	-	-	-	-	-	-	-
	Feb	-	-	-	-	-	-	-	-	-	-
	Mar	-	-	-	-	-	-	-	-	-	-
	Apr										
	May										
	June										
	July										
	Aug										
	Sep										
	Oct										
	Nov										
	Dec										

**Notes**

- (a) No samples taken at LD2 during 2013 to date as sample location was dry
- (b) No samples taken at WMP1 during 2013 to date as no flow at sample location

**Legend**

BOD = Biological oxygen demand

O & G = Oil and Grease

EC = Electrical conductivity

P = Phosphorus

SO<sup>2-</sup> = Sulfate

Fe = Iron

4

N = Nitrogen

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.

# GLENCORE

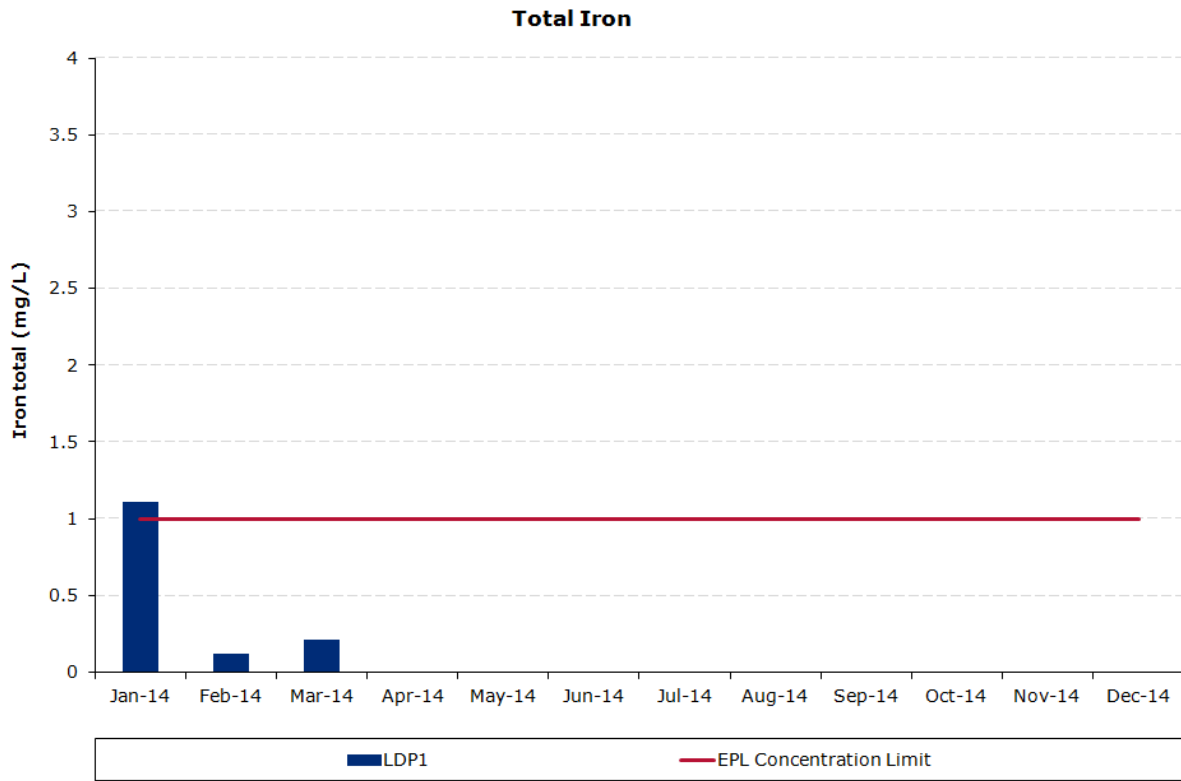
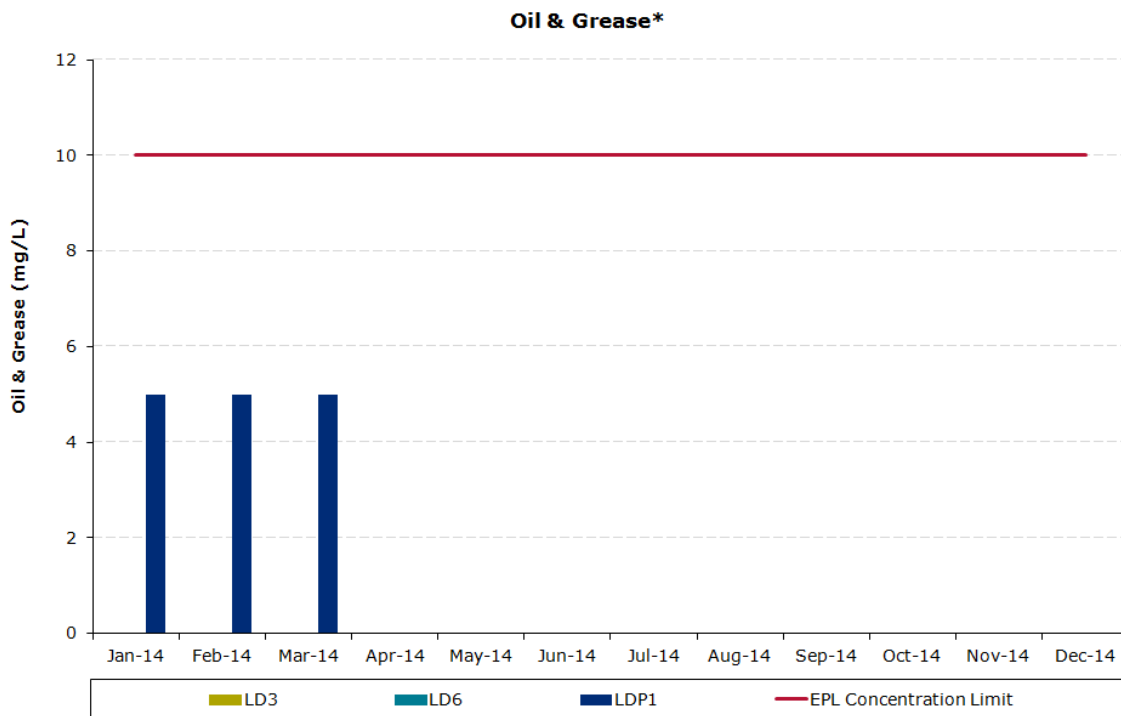


Figure 3.1: Total iron levels



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

Figure 3.2: Oil and grease levels

# GLENCORE

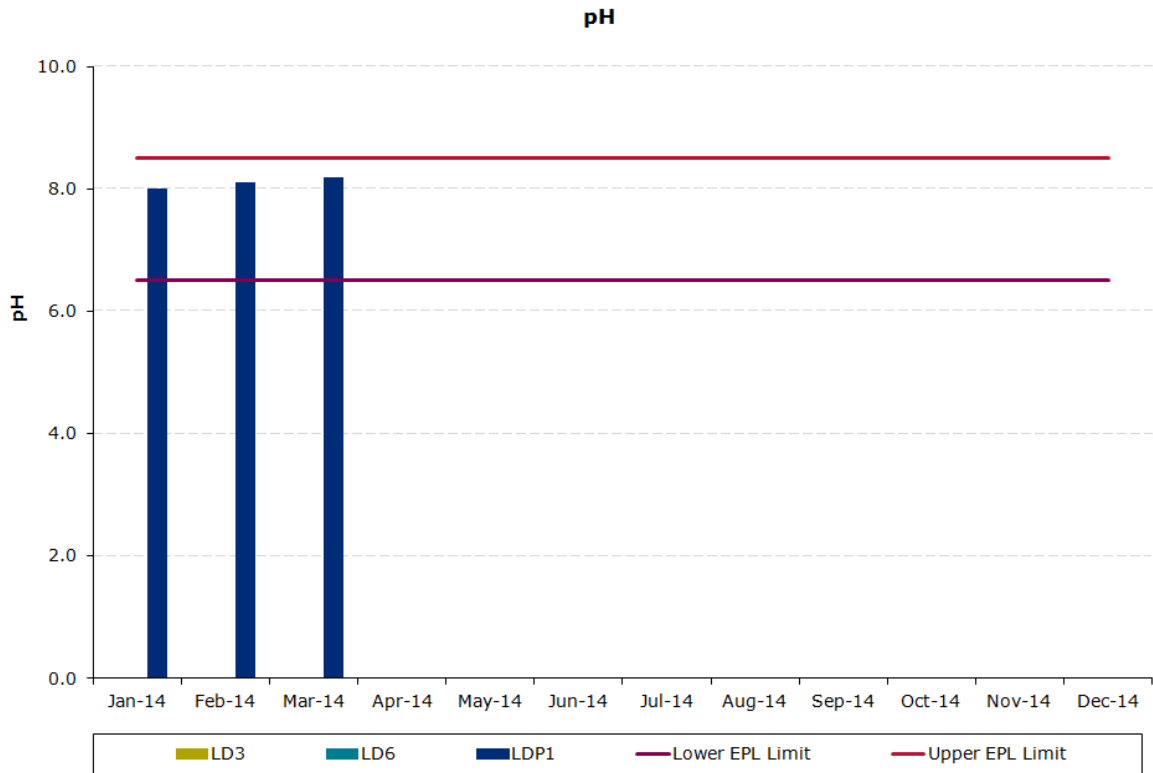
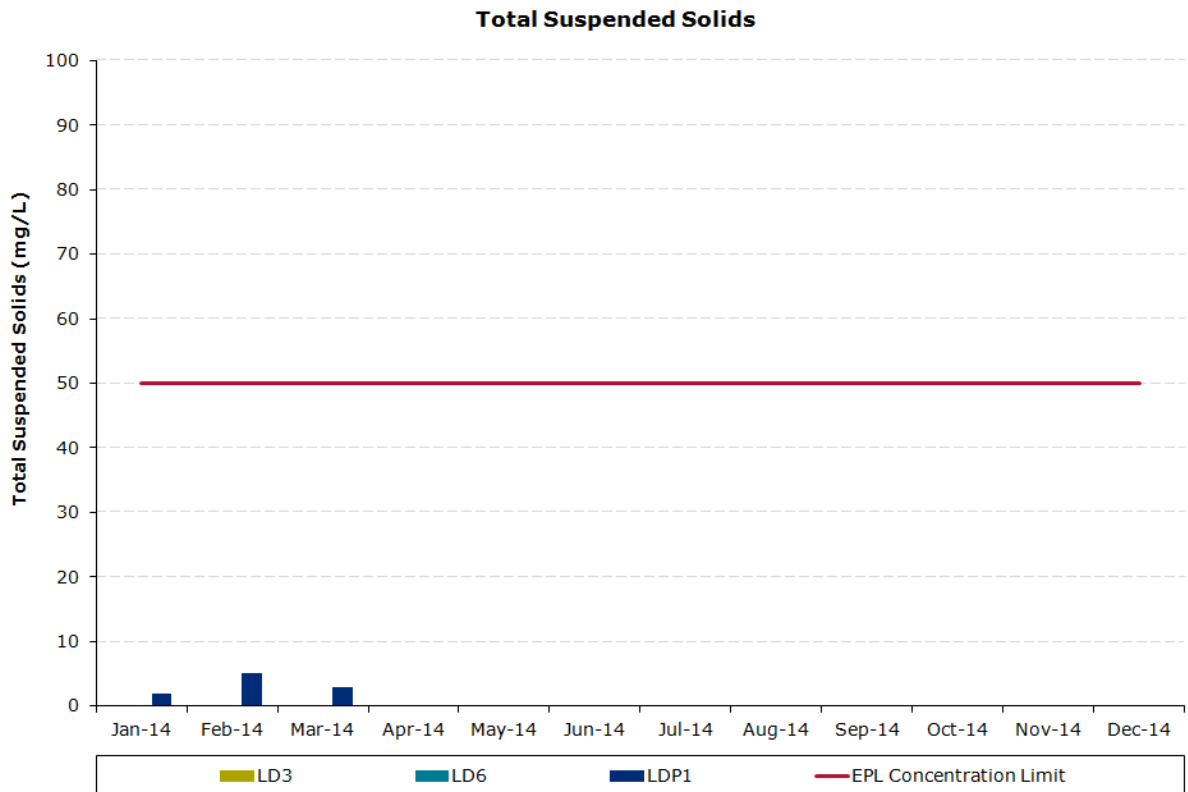


Figure 3.3: pH levels



# GLENCORE

Figure 3.4: Total suspended solids levels

All samples recorded were within EPL concentration limits during the reporting period with the exception of Iron during January 2014.

- Total iron during January at LDP01 was 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 than 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 caused by sampling or laboratory error.
- All samples for oil and grease returned levels of less than 5 mg/L, well below the EPL concentration limit of 10 mg/L.
- All samples returned pH results that were within the upper and lower EPL limits (8.5 and 6.5 respectively).
- Highest TSS was 5mg/L at LDP01 well below the 50mg/L limit.

Monthly EPL reporting can be accessed here:

<http://www.xstratacoal.com/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 31<sup>st</sup> 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).

# GLENCORE

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

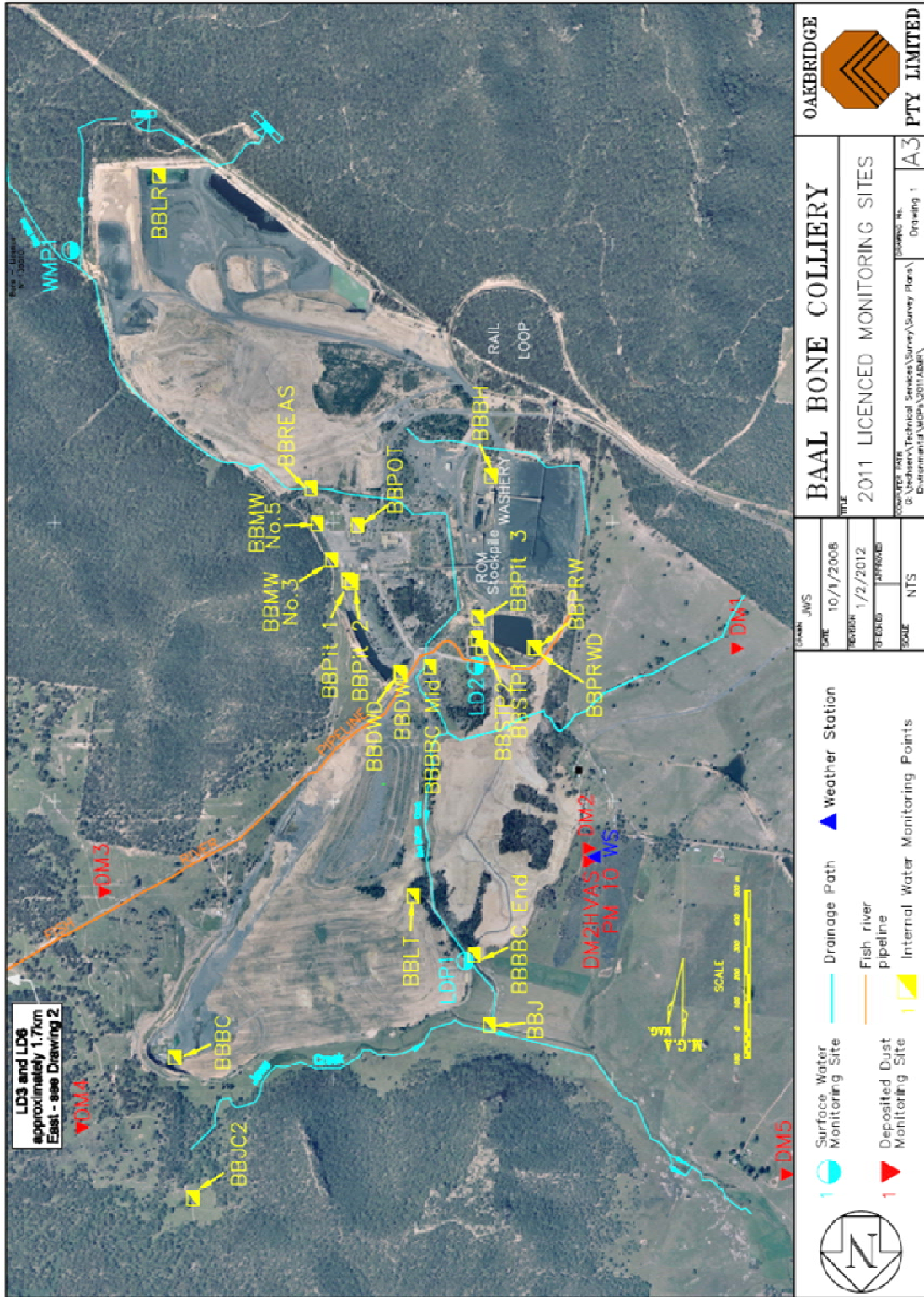
## Noise Audit Results

No noise audits were carried out during the reporting period.

Previous noise audit reports can be accessed from the Baal Bone publications page at:  
<http://www.xstratacoal.com/EN/Operations/Baalbone/Pages/BaalBonePublicationsArchive.aspx>.

# GLENCORE

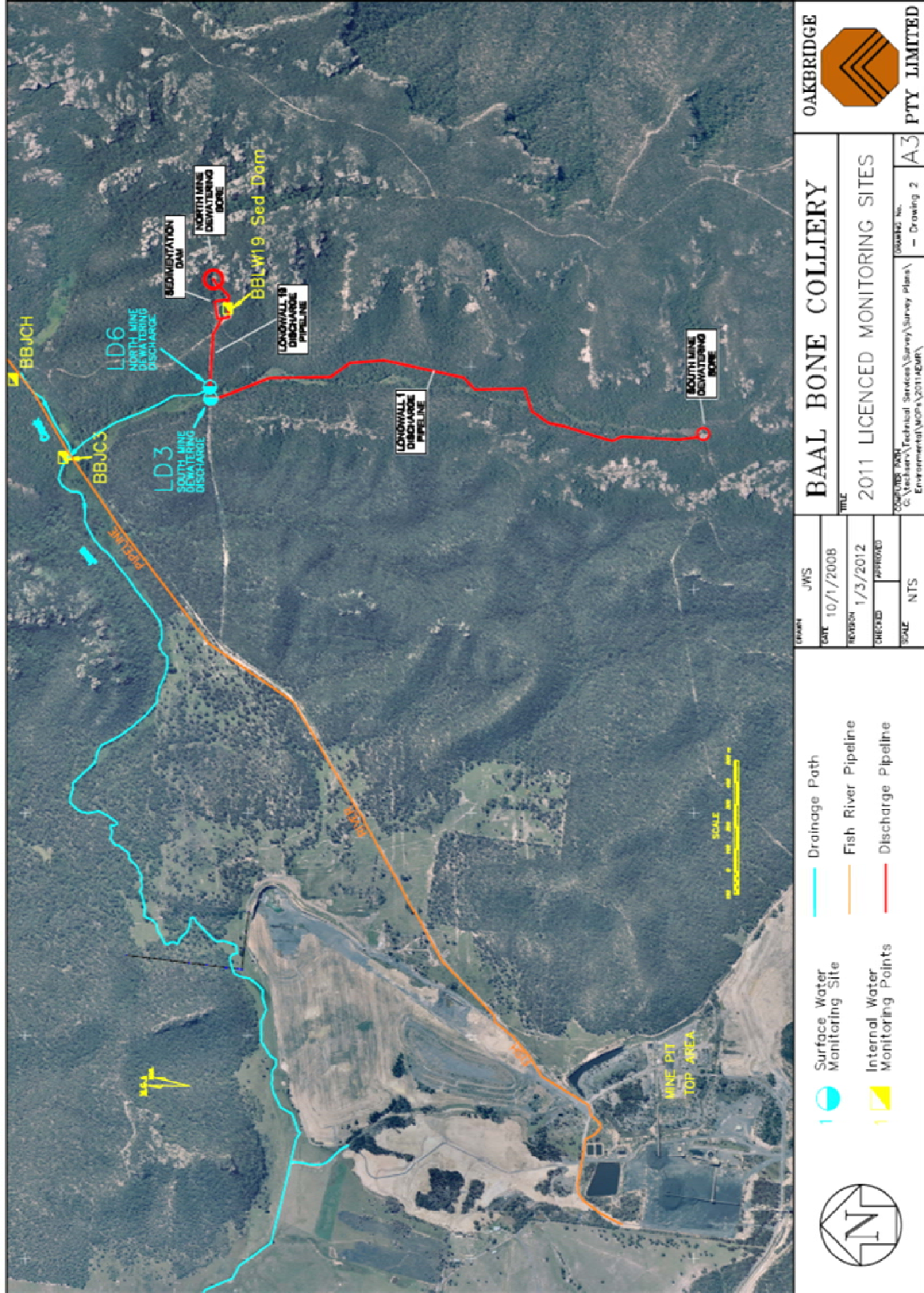
Drawing 1



<b>BAAL BONE COLLIERY</b>	
<b>2011 LICENCED MONITORING SITES</b>	
DRAWN: JWS DATE: 10/11/2006	DRAWING NO.: Drawing 1
REVISION: 1/2/2012 CHECKED: APPROVED	SCALE: NTS
OAKBRIDGE PART G. Vanderschueren\Technical Services\Survey\Survey Plans\Baal Bone\2011\LD3\LD6\A3	

# GLENCORE

Drawing 2





Drawing 3

