

GLENCORE

BAAL BONE COLLIERY

January to March 2018
Environmental Monitoring Summary



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 to 31 March 2018**. Baal Bone's licensed discharge and monitoring locations are identified in **Figure 7**.

2. Air quality

Monthly dust monitoring is carried out in accordance with Australian Standard AS3580.10.1, EPL requirements and Baal Bone's Air Quality Monitoring Program.

Monitoring is undertaken by the ALS Group Environmental Division, a NATA Accredited laboratory.

Baal Bone maintains a network of dust deposition gauges:

- Sample location DM1 (EPL monitoring point No. 7);
- Sample location DM2 (EPL monitoring point No. 13);
- Sample location DM3 (EPL monitoring point No. 14);
- Sample location DM4 (EPL monitoring point No. 15)

Locations of the dust deposition gauges are shown in Figure 7.

Schedule 3, Condition 10 of Project Approval 09_0178 includes air quality impact assessment criteria for the project and are summarised in Table 1. The pollutants to be monitored include deposited dust, TSP and PM¹⁰.

In accordance with the DP&E approved Air Quality Monitoring Program, monitoring for TSP and PM₁₀ 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.

Table 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	

The monthly results for each of the monitoring locations are summarised in **Table 2**.

Figure 1 provides the monthly deposited dust results for the year to date. **Figure 2** provides the twelve month rolling average.

Table 2: Deposited dust monitoring results for 2018 YTD (g/m²/month)

Month	DM1	DM2	DM3	DM4
January	1.7	1.4	0.7	0.4
February	1.3	0.5	0.2	0.5
March	0.7	0.6	0.9	0.6

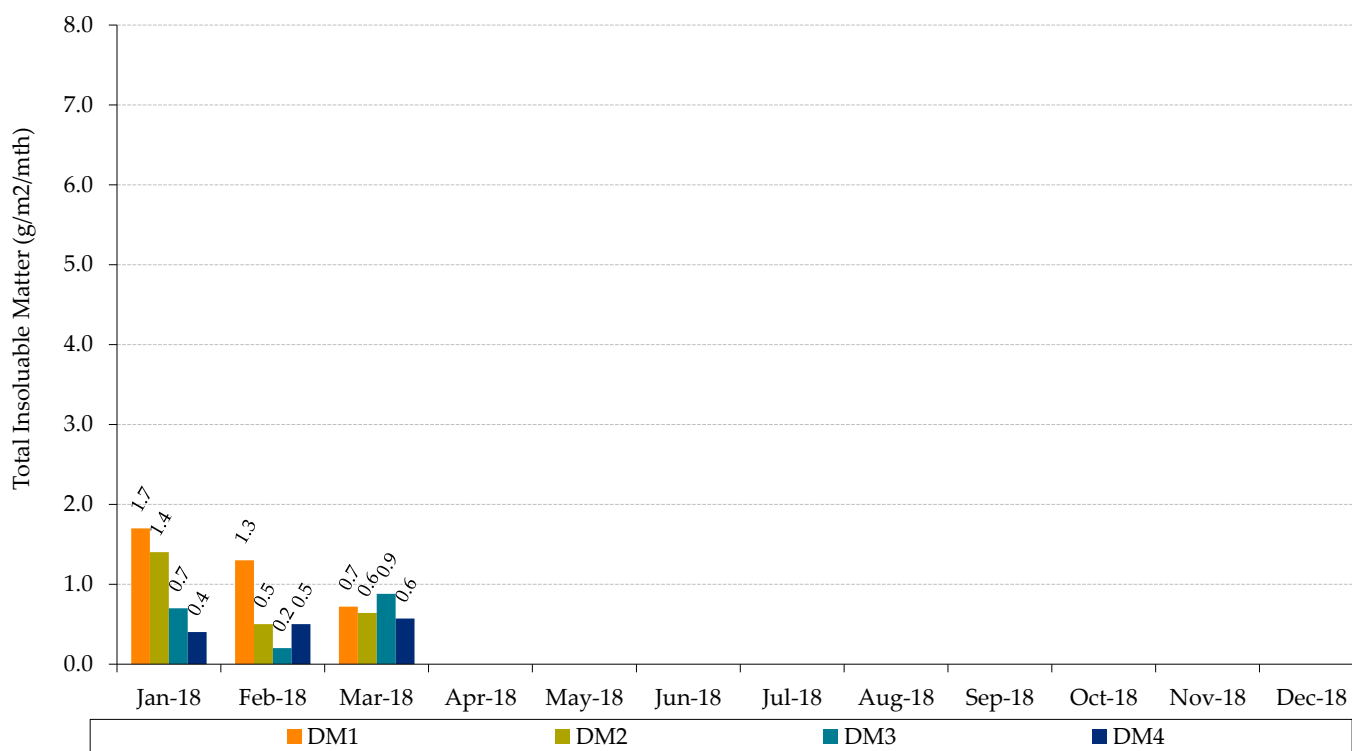


Figure 1: Monthly Total Insoluble Matter

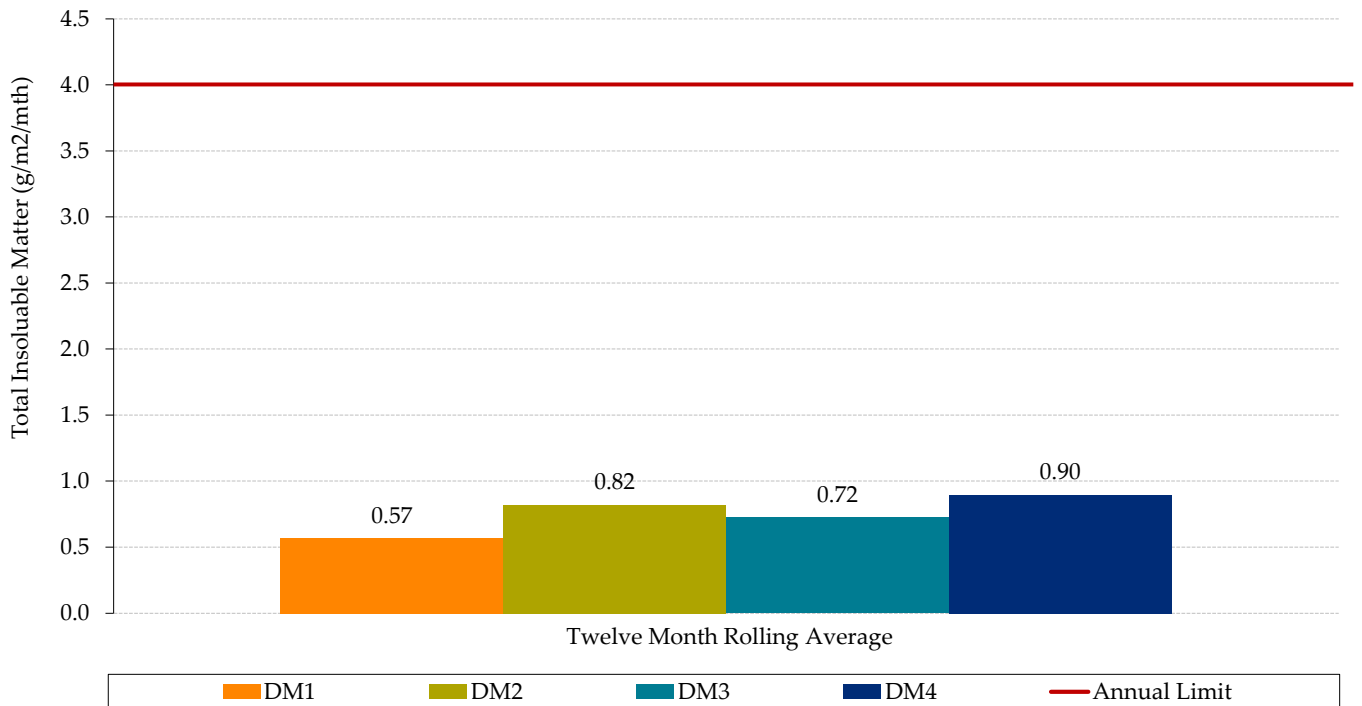


Figure 2: Twelve Month Rolling Average Total Insoluble Matter (12 months until 31 March 2018)

3. Surface Water

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**.

Table 3: EPL 765 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	-

The monthly results for each of the monitoring locations are summarised in Table 4.

Figure 3 to Figure 6 provide monthly results for each pollutant.

Table 4: EPL Water quality results for the 2018 YTD

EPL Point	Month	EC μS/cm	O&G mg/L	SO ₂₋₄ 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	-	-	-	-	-	-	-	-	-	-
LDP1	Jan	1036	<5	229	0.08	5	7.7	-	-	-	-
	Feb	920	<5	275	0.18	<5	7.6	-	-	-	-
	Mar	1060	<5	371	0.05	<5	8.07	-	-	-	-
WMP1 ^b	Jan	-	-	-	-	-	-	-	-	-	-
	Feb	-	-	-	-	-	-	-	-	-	-
	Mar	-	-	-	-	-	-	-	-	-	-

Notes (a) No samples taken at LD2 during period as sample location was dry
 (b) No samples taken at WMP1 during period as sample location was dry

Legend

BOD = Biological oxygen demand
 EC = Electrical conductivity
 Fe = Iron
 N = Nitrogen
 O & G = Oil and Grease
 P = Phosphorus
 SO₂₋ = Sulfate₄
 TSS = Total suspended solids

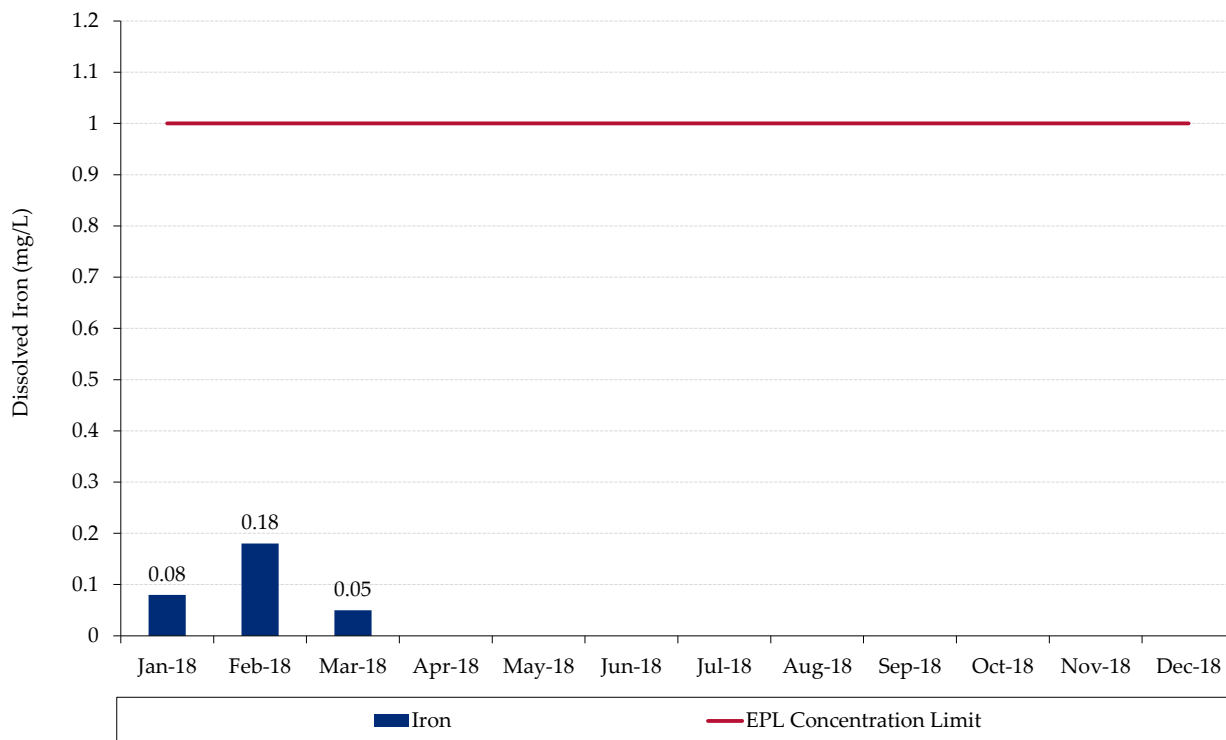


Figure 3: Monthly Dissolved Iron

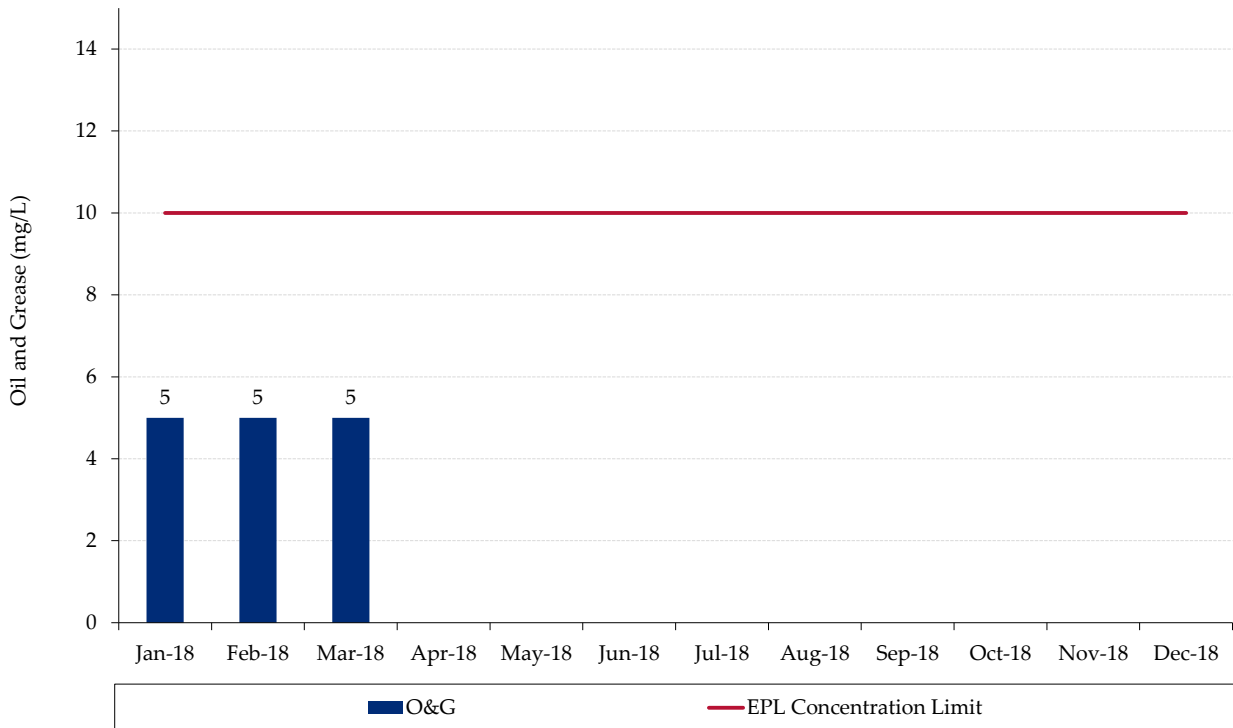


Figure 4: Monthly Oil and Grease

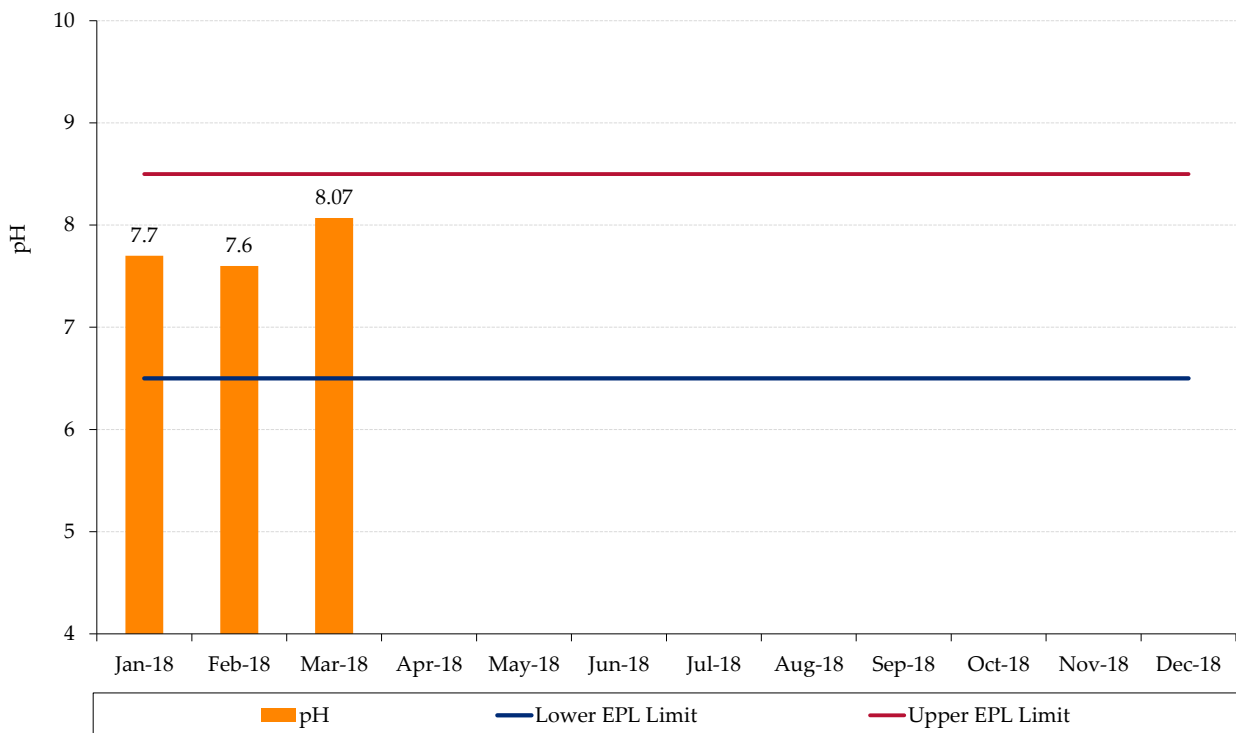


Figure 5: Monthly pH

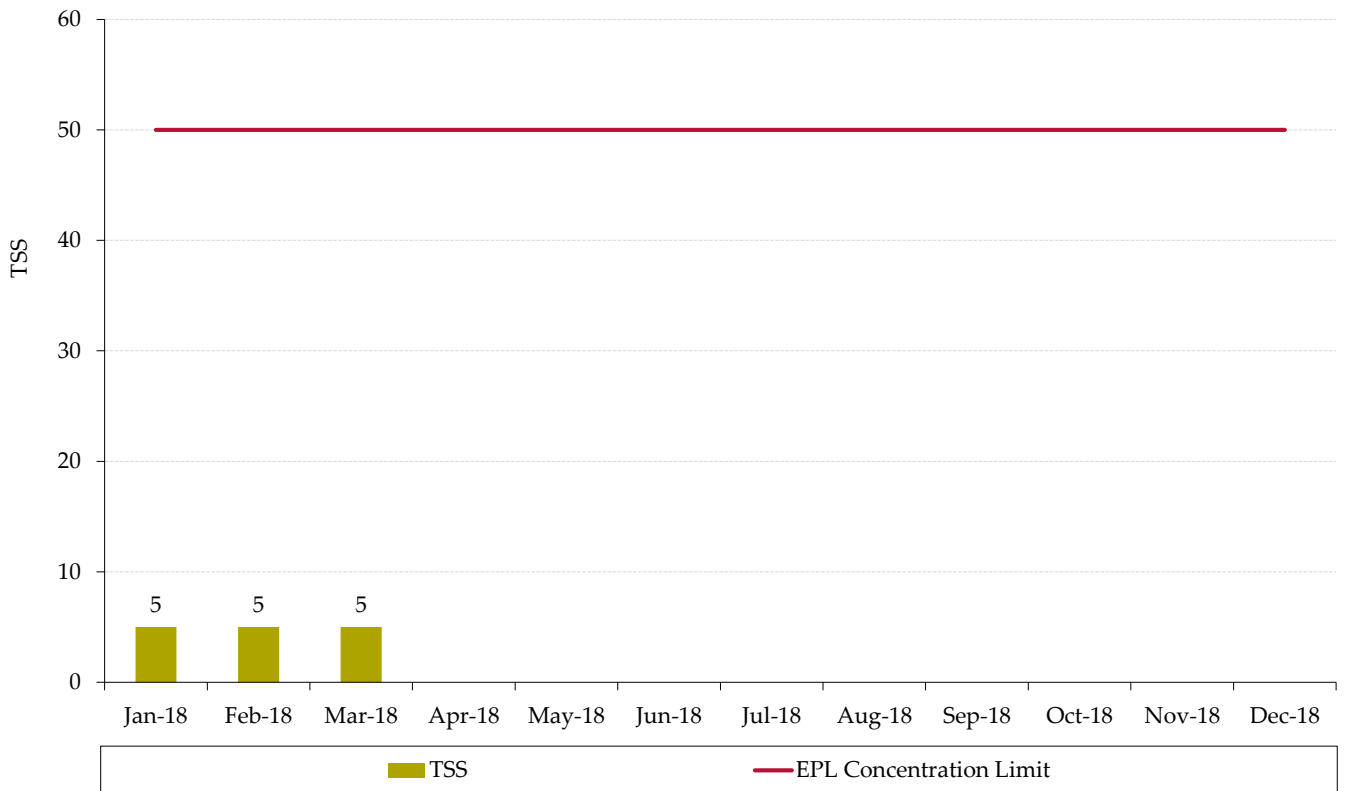


Figure 6: Monthly Total Suspended Solids

Monthly EPL reporting can be accessed at:

<http://www.glencore.com.au/en/who-we-are/energy-products/baal-bone/Pages/epl-reporting.aspx>

4. Noise

Noise Impact Assessment Criteria

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

Table 5 outlines the assessment criteria.

Table 5: 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

From 2013 onwards attended monitoring is undertaken on an annual basis at receptors R1 and R2/R3, shown in **Figure 7**.

Noise Audit Results

Global Acoustics conducted the annual environmental compliance noise audit at Baal Bone Colliery on Thursday 27 July 2017 during the day, evening and night periods. The next noise audit is scheduled for August 2018. **Table 6** to **Table 8** provide a summary of the 2017 noise audit results.

Table 6: Noise Audit Summary (Daytime)

Location (Start time)	Measured Predicted Colliery Noise	Limit	Unit	Comments
	L _{Aeq}			
Daytime Audit (1244-1341) – Thursday 27 July 2017				
Location R1 (1326 hours)	IA	46	dBA	In compliance
Location R1 (1341 hours)	<20	46	dBA	In compliance
Location R2/3 (1244 hours)	<30	41	dBA	In compliance
Location R2/3 (1259 hours)	<30	41	dBA	In compliance

Table 7: Noise Audit Summary (Evening)

Location (Start time)	Measured Predicted Colliery Noise	Limit	Unit	Comments
	L _{Aeq}			
Evening Audit (2029-2125) – Thursday 27 July 2017				
Location R1 (2029 hours)	26	46	dBA	In compliance
Location R1 (2044 hours)	26	46	dBA	In compliance
Location R2/3 (2110 hours)	IA	41	dBA	In compliance
Location R2/3 (2125 hours)	IA	41	dBA	In compliance

Table 8: Noise Audit Summary (Night)

Location (Start time)	Measured Predicted Colliery Noise	Limit	Unit	Comments
	L _{Aeq}			
Night Audit (2201-2254) – Thursday 27 July 2017				
Location R1 (2239 hours)	<20	46	dBA	In compliance
Location R1 (2254 hours)	<20	46	dBA	In compliance
Location R2/3 (2201 hours)	<20	41	dBA	In compliance
Location R2/3 (2216 hours)	<20	41	dBA	In compliance

The audit report concluded that:

“Activities from BBC complied with the relevant noise limits during attended monitoring on 27 July 2017 at all monitoring locations. There were no exceedances, complaints or noise related incidents recorded by BBC since the previous monitoring was carried out (August 2016). No measurements occurred during which BBC mine was directly measurable, was within 5 dB of the relevant limits and where meteorological conditions resulted in criteria applying (in accordance with the EPL).”

The full July 2017 audit report and previous noise audit reports can be accessed from the Baal Bone publications web page at:

<http://www.glencore.com.au/en/who-we-are/energy-products/baal-bone/Pages/epl-reporting.aspx>

The next noise audit is scheduled for mid 2018.

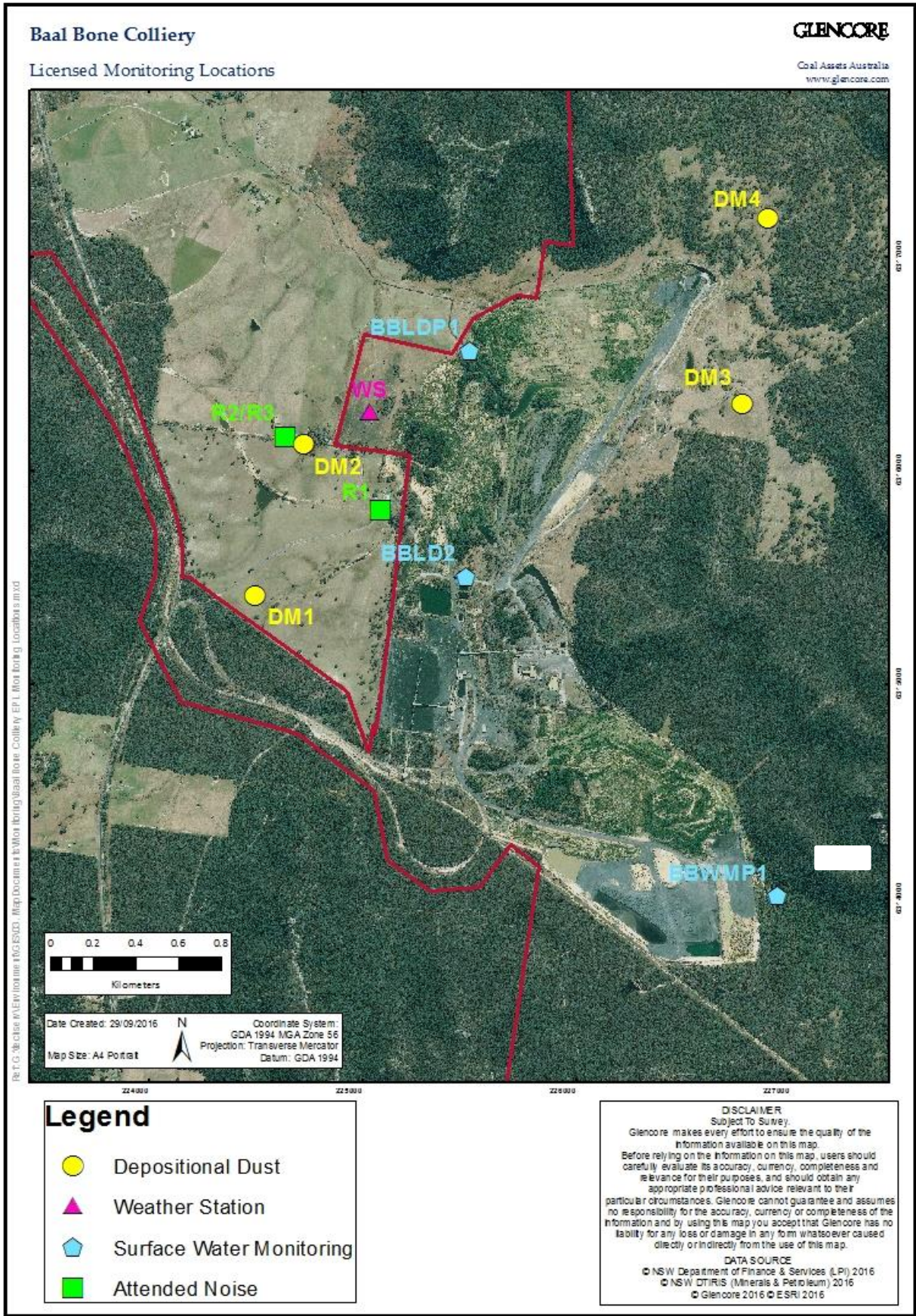


Figure 7. Baal Bone Monitoring Points