GLENCORE

BAAL BONE COLLIERY

October to December 2020
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 October 2020 to 31 December 2020.** 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.

Sample analysis 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 Error! Reference source not found..

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 PM^{10}.

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 $\mu g/m^3$	
PM10	24 hour	50 $\mu g/m^3$	
	Annual	30 $\mu g/m^3$	

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 2020 (g/m²/month)

Collection Date	EPL Point 7 DM1	EPL Point 13 DM2	EPL Point 14 DM3	EPL Point 15 DM4
16-Jan-20	6.8	7.2	8.2	12.1
17-Feb-20	2.4	4.3	3.6	3.7
17-Mar-20	1.2	1.0	1.2	0.9
16-Apr-20	0.2	0.5	0.5	0.2
14-May-20	0.7	0.7	0.7	0.7
15-Jun-20	2.0	0.2	0.2	0.3
13-Jul-20	0.5	0.7	0.3	0.2
10-Aug-20	0.3	0.4	0.3	0.2
9-Sep-20	0.8	0.3	0.2	0.2
8-Oct-20	1.4	0.4	0.4	0.4
9-Nov-20	1.4	0.3	0.4	0.3
8-Dec-20	0.6	0.6	0.7	0.8

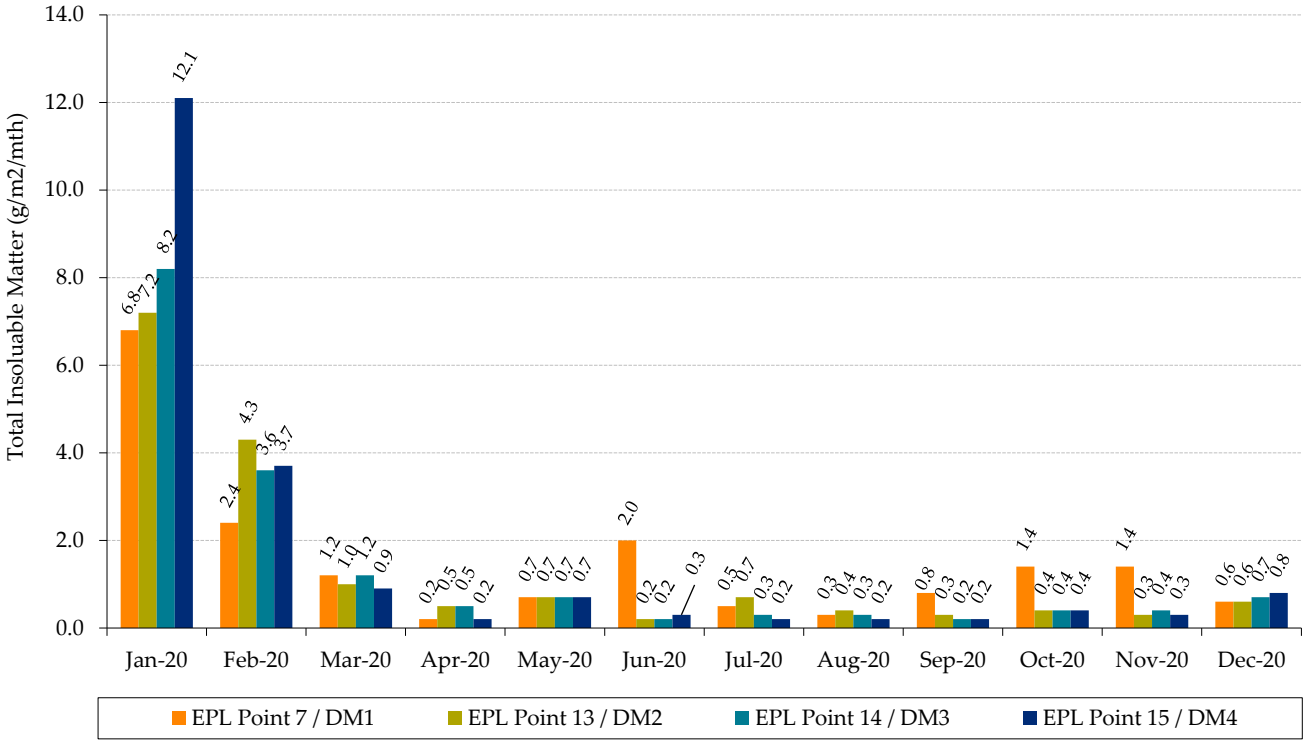

Figure 1: Monthly Total Insoluble Matter

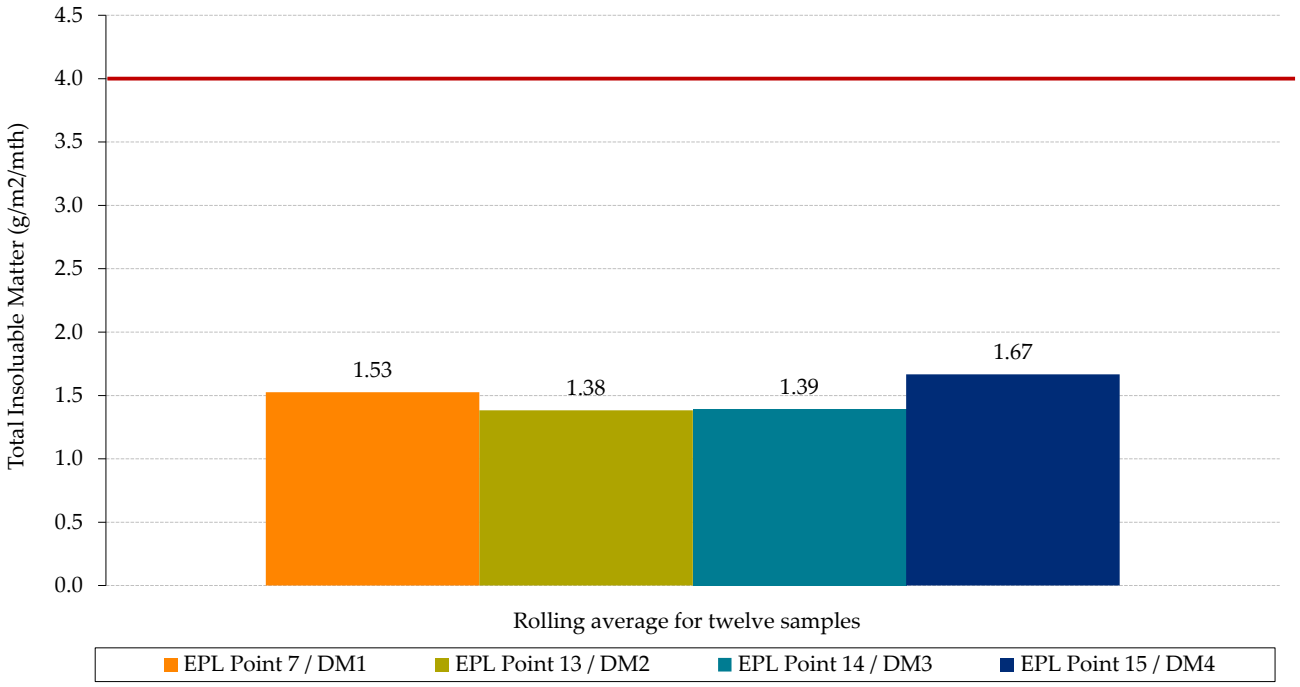

Figure 2: Rolling Average Total Insoluble Matter (12 samples until December 2020)

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

	EPL Monitoring Point 2 (LD2)	EPL Monitoring Point 16 (LDP1)
Oil and grease (mg/L)	-	10
pH	-	6.5-8.5
Total Suspended Solids (mg/L)	-	50
Dissolved 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 2020

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
EPL Point 2 (LD2[a])	Jan	-	-	-	-	-	-	-	-	-	-
	Feb	-	-	-	-	-	-	-	-	-	-
	Mar	-	-	-	-	-	-	-	-	-	-
	Apr	-	-	-	-	-	-	-	-	-	-
	May	-	-	-	-	-	-	-	-	-	-
	Jun	-	-	-	-	-	-	-	-	-	-
	Jul	-	-	-	-	-	-	-	-	-	-
	Aug	-	-	-	-	-	-	-	-	-	-
	Sep	-	-	-	-	-	-	-	-	-	-
	Oct	-	-	-	-	-	-	-	-	-	-
	Nov	-	-	-	-	-	-	-	-	-	-
	Dec	-	-	-	-	-	-	-	-	-	-
EPL Point 16 (LDP1)	Jan	1018	**11**	370	0.06	<5	7.9	-	-	-	-
	Feb	980	<5	354	<0.05	<5	6.9	-	-	-	-
	Mar	1025	<5	382	0.06	<5	7.3	-	-	-	-
	Apr	910	<5	344	0.05	5	7.0	-	-	-	-
	May	885	<5	332	<0.05	6.0	6.9	-	-	-	-
	Jun	932	<5	345	<0.05	<5	7.2	-	-	-	-
	Jul	962	<5	398	<0.05	6.0	7.0	-	-	-	-
	Aug	673	<5	261	**1.68**	18.0	6.5	-	-	-	-
	Sep	769	<5	275	<0.05	<5	7.0	-	-	-	-
	Oct	790	<5	255	0.09	<5	6.8	-	-	-	-
	Nov	931	<5	290	0.06	<5	7.2	-	-	-	-
	Dec	839	<5	305	<0.05	<5	7.2	-	-	-	-

Notes **(a)** No samples taken at LD2 during 2020 as sample location was dry

Legend

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

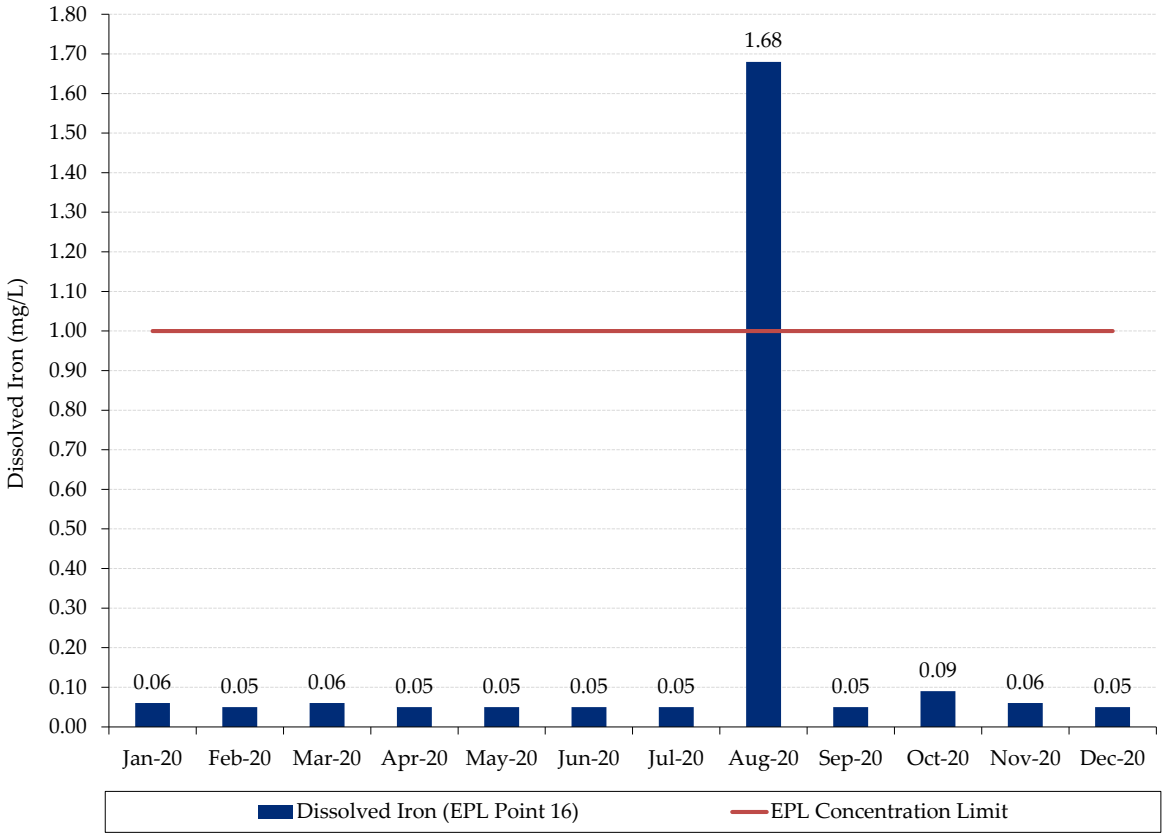

Figure 3: Monthly Dissolved Iron

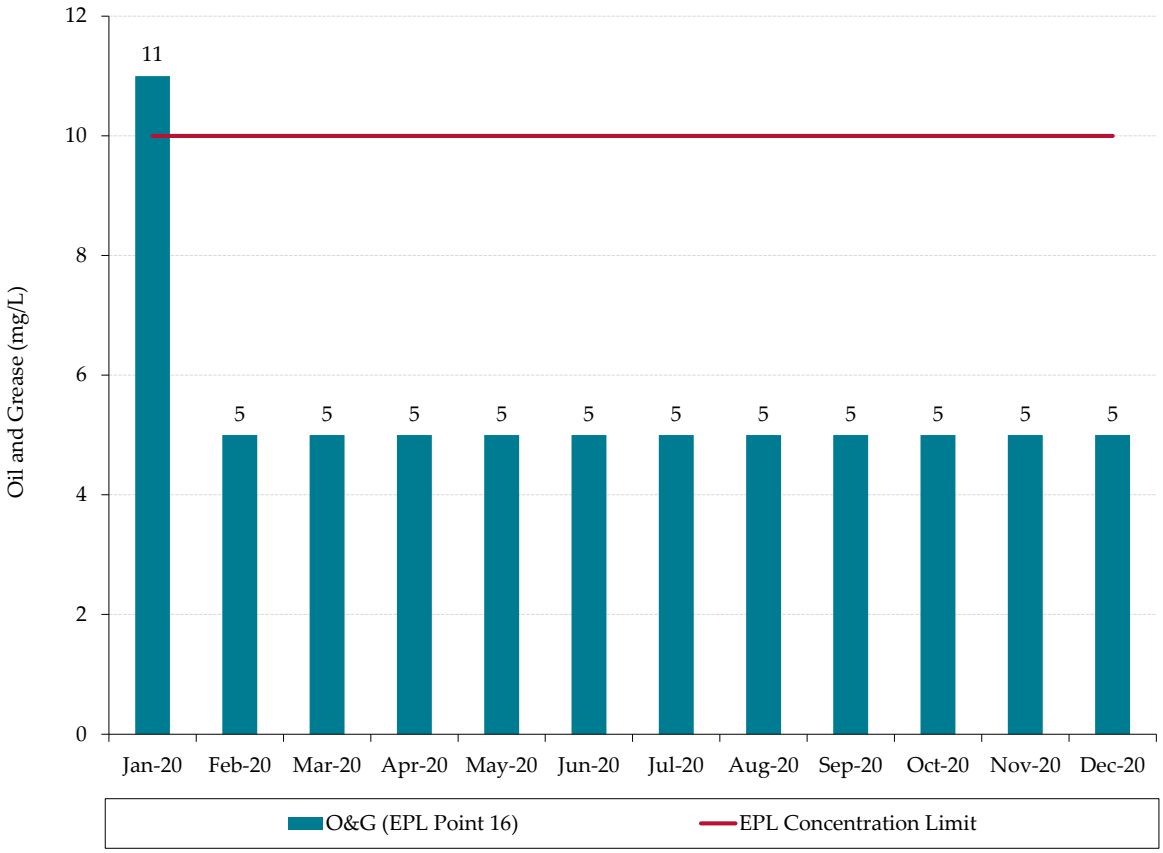

Figure 4: Monthly Oil and Grease

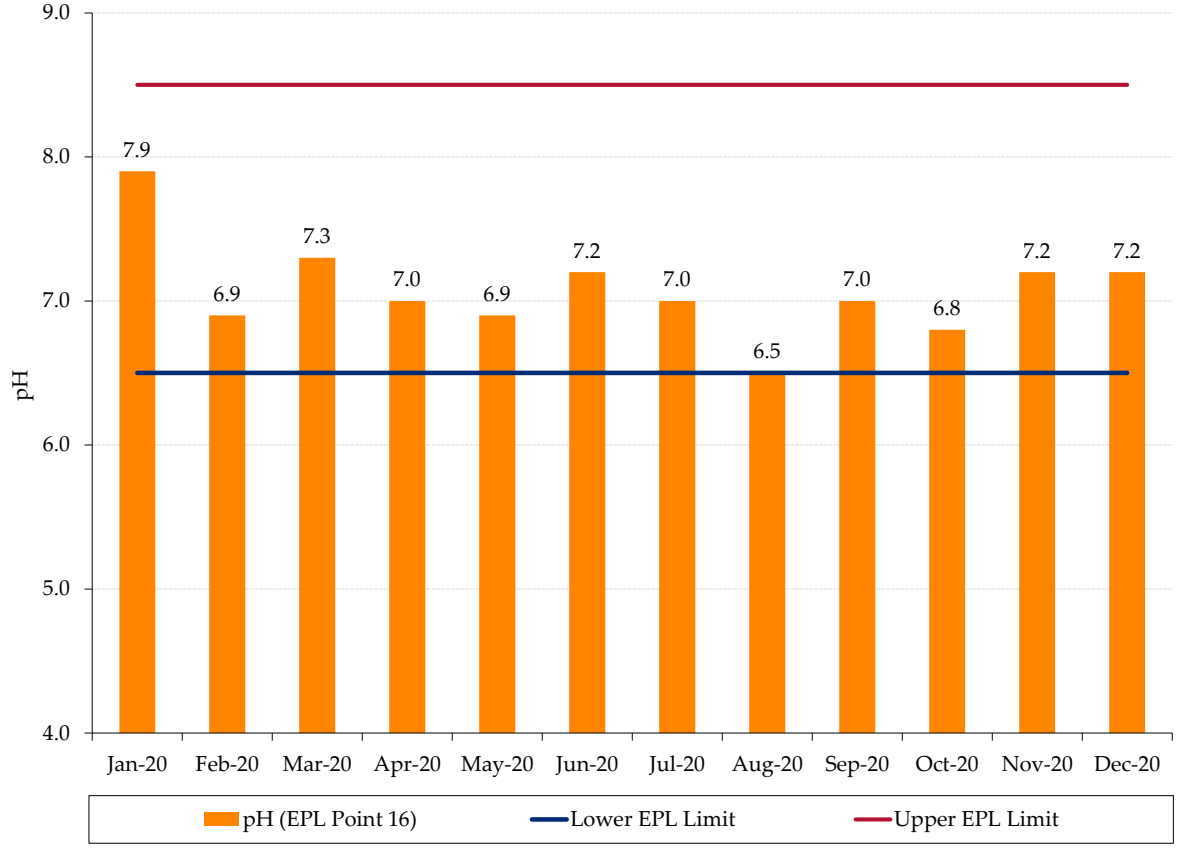

Figure 5: Monthly pH

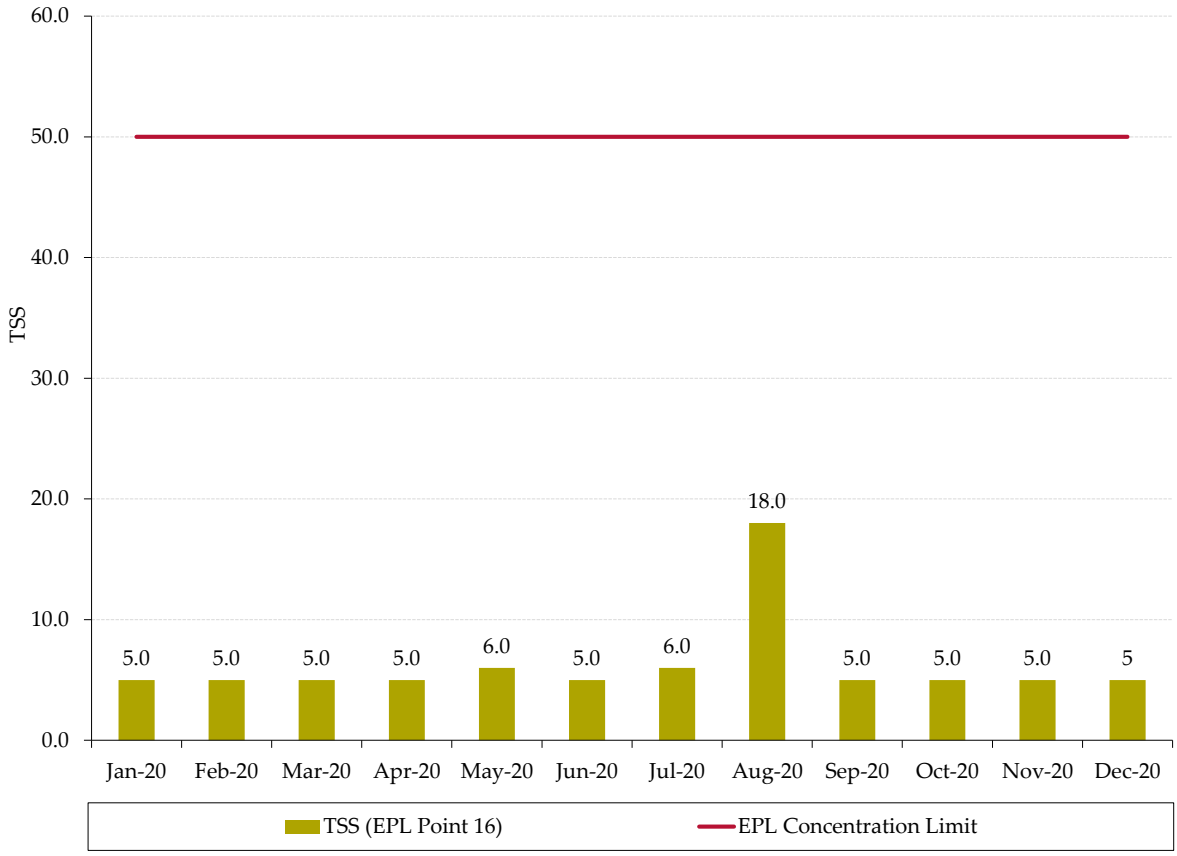

Figure 5: Monthly Total Suspended Solids

A summary of monitoring results for EPL discharge and monitoring points (those with specified concentration limits) can be found below for the 2020 reporting period:

- All samples returned pH results that were within the upper and lower EPL limits (8.5 and 6.5 respectively);
- All monthly TSS results were below the EPL concentration limit of 50 mg/L;
- Oil and grease levels were below the EPL concentration limit of 10mg/L with the exception of the January 2020 result:
    - Oil and grease levels in the sample taken on 22 January 2020 exceeded the EPL concentration limit of 10mg/L, with a result of 11 mg/L.
    - A notification was sent to the Environment Protection Agency and the Department of Planning, Industry and Environment on 24/02/2020 regarding the oil and grease exceedance.
    - An investigation was undertaken into this exceedance which found that potential contributors may have been the extended dry spell and recent rainfall, the bushfires moving through the area as well as vehicles and machinery on site.
    - Oil and grease levels for the remainder of 2020 were below the EPL concentration limit.
- Dissolved iron results were below the EPL concentration limit, except for the sample taken on 25 August 2020 at EPL Point 16 which returned an elevated result for dissolved iron.
    - EPL 765 condition M2 has a concentration limit of 1.0 mg/L for dissolved iron. The analysis of the sample identified that there was a concentration level of 1.68 mg/L dissolved iron.
    - Initial notification to Environment Protection Agency and the Department of Planning, Industry and Environment (DPIE), DPIE – Resources Regulator and National Resource Access Regulator took place on 8/09/20. A subsequent investigation report was provided to the same Regulators on 14/9/20.
    - Actions undertaken include checking the result with the lab, and retesting the sample. The retest of the sample returned a result of 1.54mg/L and the duplicate sample returned a result of 1.58 mg/L.
    - Dissolved iron levels for the remainder of 2020 were below the EPL concentration limit.

Note:

Monthly EPL reporting can be accessed at: Reporting documents - Baal Bone Colliery (glencore.com.au).

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) $L_{Aeq(15\ min)}$	Night dB(a) $L_{A1(1\ min)}$
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 Tuesday 30 July 2020 during the day, evening and night periods. The next noise audit is scheduled for mid 2021. **Table 6** to **Table 8** provide a summary of the 2020 noise audit results.

Table 6: Noise Audit Summary (Daytime)

Location (Start time)	Measured Predicted BBC Noise $L_{Aeq15min}$ dB	Limit	Unit	Comments
Daytime Audit – Thursday 30 July 2020				
Location R1 (1607 hours)	IA	46	dB	In compliance
Location R1 (1631 hours)	IA	46	dB	In compliance
Location R2/3 (1525 hours)	IA	41	dB	In compliance
Location R2/3 (1542 hours)	IA	41	dB	In compliance

Table 7: Noise Audit Summary (Evening)

Location (Start time)	Measured Predicted BBC Noise	Limit	Unit	Comments
	$L_{Aeq15min}$ dB			
Evening Audit– Thursday 30 July 2020				
Location R1 (2123 hours)	<25	46	dB	In compliance
Location R1 (2141 hours)	<25	46	dB	In compliance
Location R2/3 (2036 hours)	IA	41	dB	In compliance
Location R2/3 (2056 hours)	IA	41	dB	In compliance

Table 8: Noise Audit Summary (Night)

Location (Start time)	Measured Predicted BBCNoise	Limit	Unit	Comments
	$L_{Aeq15min}$ dB			
Night Audit– Thursday 30 July 2020				
Location R1 (2201 hours)	<25	46	dB	In compliance
Location R1 (2219 hours)	<25	46	dB	In compliance
Location R2/3 (2245 hours)	IA	41	dB	In compliance
Location R2/3 (2303 hours)	IA	41	dB	In compliance

The audit report concluded that:

"Attended environmental noise monitoring described in this report was undertaken during the day, evening, and night periods of 30 July 2020. The purpose of the survey is to quantify and describe the acoustic environment around the site and compare with specified limits.

There were no exceedances, complaints or noise related incidents recorded by BBC since the previous monitoring was carried out (July 2019).

Noise levels from BBC complied with the relevant noise limits during the July 2020 survey. Criteria may not always be applicable due to meteorological conditions at the time of monitoring."

The full July 2020 audit report and previous noise audit reports can be accessed from the Baal Bone publications web page at: Reporting documents - Baal Bone Colliery (glencore.com.au).

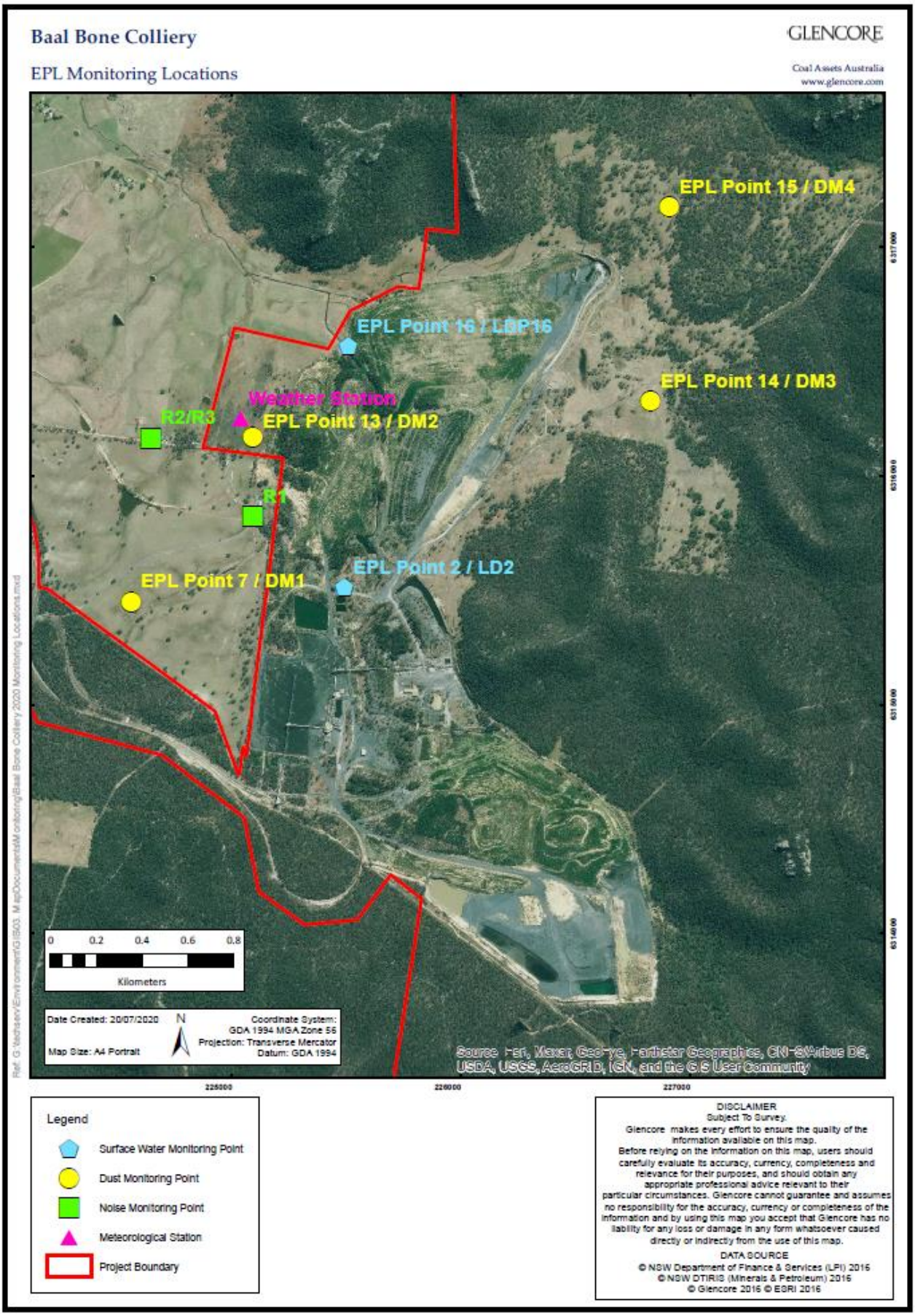

Figure 7: Baal Bone Colliery EPL Monitoring Points