

BAAL BONE UNDERGROUND

GLENCORE

10 December 2020

Mr Greg Kininmonth
Manager and Principal Inspector Environment (Southern)
Department of Planning, Industry and Environment
PO Box 5475
WOLLONGONG NSW 2500

Dear Greg,

A Groundwater Monitoring Plan was developed as a requirement of Condition 21 of Schedule 3 of the Baal Bone Project Approval (09_0178). Clause 3 of this Condition states that the Plan must include "groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts".

Results supplied in November identify that a monitoring point known as BBP3 registered a third consecutive value above the adopted impact assessment criteria for Zinc at a location in the Coxs River Swamp. The assessment criteria has a short term major change criteria limit of 0.175 mg/L. Results over the previous three months include 0.179 mg/L on 22.9.20, 0.204 mg/L on 28.10.20 and 0.194 mg/L on 16.11.20. All other elements were well within both the short term minor change and short term major change criteria throughout this period.

Element	Short Term Minor Change Criteria ^A	Short Term Major Change Criteria ^A	All Bore 80 th Percentile	BBP4 80 th Percentile
pH	4.6	4.2	5.0*	5.5*
Electrical Conductivity (µS/cm)	300	300	90	90
Copper (mg/L)	0.041	0.043	0.011	0.007
Iron (mg/L)	15.25	24.28	11	11
Zinc (mg/L)	0.143	0.175	0.098	0.074

Figure 1 - Groundwater Management Plan Table 3.1 - Water Quality Trigger Levels

A Surface Water and Groundwater Response Plan was also developed as a requirement of Condition 22 of Schedule 3 of the Baal Bone Project Approval (09_0178). This Plan identifies the response should there be an exceedance of surface water, stream health or groundwater assessment criteria.

Trigger	Action	Response	Plan	Timeframe
Monitoring results outside the relevant trigger levels in the SWMP or GWMP: ECC determines that the deviation from background trends and adopted impact assessment criteria could result in environmental harm, three (3) consecutive values are outside the adopted impact assessment criteria; or the measurement varies significantly from background water quality trends.	- Notify the ECC, or delegate; - Review monitoring results against historical monitoring data; - Review recent monitoring results for adjacent monitoring sites; - Review any relevant operational data (i.e. clearing activities, UG mining activities, meteorological data etc.); - Determine if an incident has potentially occurred; - Complete investigation. IF Investigation reveals actual or potential material harm to the environment, the ECC (together with the Ops Mgr) will initiate the PIRMP immediately. • Inform regulatory agencies as required.	- A remedial action plan is developed and implemented to address the investigation findings. - Remedial action plan could include: - Increase monitoring frequency where relevant; - Undertake additional monitoring (stream health monitoring, etc.) if necessary. - Corrective/preventative actions based on the outcomes of the investigation and/or additional monitoring;	- Follow up information is provided to regulatory agencies as requested; where requested, and - A summary of monitoring results, investigations and remedial actions plans is provided within the Annual Review. - Monitor the completion of actions to ensure they have been effective. IF • Material Harm Incident occurred- Internal and External Reporting requirements are completed in accordance with Section 5 of Baal Bone's PIRMP, and reporting obligations detailed in EPL No. 765 and the Project Approval.	Notification to Secretary and any other relevant agencies (e.g. EPA, DPI Water) as soon as practicable (Schedule 5, Condition 5 of PA 07_0178). Immediate reporting of material harm incident required by POEO Act.

Figure 2 - Surface Water and Groundwater Response Plan Table 2.2 - Loss of Water Quality TARP

Groundwater in and around Cocks River Swamp has been monitored for the purpose of identifying any potential impacts associated with the mining of Longwalls 29-31. Monitoring has occurred on a monthly basis, since 2007 for groundwater level and since 2008 for groundwater quality. The monitoring network consists of six (6) monitoring bores which includes one background monitoring bore (BBP4). Figure 3 below shows the locations of these bores. Mining ceased in this area in 2011.



Figure 3 - Groundwater Monitoring Locations

The location registering the exceedance, known as BBP3, has had previous exceedances for zinc trigger levels. Increases in trace metals in 2011 resulted in Baal Bone engaging Aurecon to conduct an investigation. Their report identified that zinc exceedances were a result of natural variability and that the largest increase corresponded with the peak in rainfall recovery.

In 2019, Hansen Bailey were engaged to conduct an independent environmental audit of compliance at Baal Bone Colliery. Hansen Bailey (2019) found that ongoing exceedances of water quality trigger levels for dissolved zinc at BBP3 was a low risk non-compliance. The audit recommended that Baal Bone Colliery, "revisit the zinc trigger levels for BBP3 in consultation with DPIE for the closure stage".

In 2020, Umwelt were engaged in part to determine the potential causes of elevated zinc concentrations at BBP3 and identify whether the existing groundwater minor and major change criteria (trigger values) should be updated.

In relation to zinc the report states that *"the peak concentrations during many of these events was recorded shortly after increased rainfall following a prolonged dry period. This suggests that rainfall-runoff infiltration has mobilised zinc from dry strata within the BBP3 catchment and that a wetting and drying process could be a significant contributor to groundwater zinc concentrations."* Also that *"Elevated zinc concentrations were observed to occur pre-mining, during mining and post-mining. Elevated zinc concentrations at times followed a rise in groundwater level in BBP3"*.

The impacts of increased rainfall appear to be the major contributing factor for these trigger level exceedances. Sampling has been able to be undertaken from January to November of this year at the Baal Bone Coxs River sampling location which is near to BBP4. This is due to rainfall in this area throughout 2020. In comparison, there was no sampling able to be undertaken at this location throughout all of 2019. An inspection was also undertaken in the area of BBP3 on 8 December 2020 which identified no anomalies aside from the aforementioned river water flow through the swamp which was dry on the surface at this time last year.

Closure activities commenced at Baal Bone in December 2019. As part of these activities, consolidation of management plans is being undertaken. This consolidation, approved by DPIE on 14.8.20, included a review of groundwater monitoring. Based on the Umwelt recommendations, Baal Bone Colliery wrote to your Department on 17 November 2020 requesting permission to cease groundwater monitoring in BBP1, BBP2, BBP5, and BBP6 and to continue monitoring at BBP3 and BBP4 at a reduced frequency of once every two months, for at least another six months, until June 2021.

Should you have any questions please do not hesitate to contact Greg Peard on 6350 6920 or at greg.peard@glencore.com.au.

Yours sincerely,



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