NSW GOVERNMENT | Department of Primary Industries

- 6 DEC 2013

OUT13/34120

Ms Alice Smith
Mining Projects
NSW Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

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Dear Ms Smith,

Cowal Gold Mine (DA 14/98 Mod.11)
Proposed Modification

I refer to your email dated 27 September 2013 requesting advice from the Department of Primary Industries (DPI) in respect to the above matter.

Comment by NSW Office of Water
The NSW Office of Water provides the following key comments, and the further comments and recommended conditions, should the application be approved, detailed in Attachment A.

- The project proposes no increase in water demand hence no changes are proposed to the current water sources or volumes required. The assessment however has indicated an increase in groundwater inflows to the open pit from the current 182 ML/yr to a maximum of 252 ML/yr. This will require adequate licensing within the relevant water sources to account for the water take. The proponent is in discussions with the NSW Office of Water to consider the ability of their current licence entitlements to account for this increase.
- The NSW Office of Water requests additional information to support the groundwater modelling to justify the water take from the relevant water sources during and post mining. This includes modelled outputs from each water source, a calibration assessment of the mine site model and a quantitative assessment of uncertainty of the mine site model.
- The Environmental Assessment has adequately addressed the Aquifer Interference Policy minimal impact considerations with respect to the Lachlan Fold Belt Water Source. However, additional information is requested in support of predicted impacts to the water quality of the Upper Lachlan Alluvial Water Source.
- A conceptual plan is requested of the proposed access road to the eastern pump station. An assessment of the potential redistribution of flood waters is also requested to confirm the ability to mitigate impacts.

- Management of extraction from the Bland Ck Paleochannel borefield is currently administered by licences and approvals under the *Water Management Act 2000* and a Groundwater Contingency Strategy within the existing Site Water Management Plan. These set a combination of daily and annual extraction limits in addition to trigger levels for the implementation of contingency measures to manage impacts on existing water users. The NSW Office of Water considers these arrangements are adequate to manage the extraction from the Bland Creek Paleochannel.
- The Office of Water supports the proposed review of the Site Water Management Plan and the Surface Water, Groundwater, Meteorological and Biological Monitoring Programme. The recommendations in Section 12 of the Hydrogeological Assessment are supported.
- Licensing under the *Water Act 1912* and/or *Water Management Act 2000* will need to be considered in consultation with the NSW Office of Water for additional monitoring bores, dewatering bores and the access road to the eastern pump station.

For further information please contact Tim Baker, Senior Water Regulation Officer (Dubbo office) on 6841 7403, or at: Tim.Baker@water.nsw.gov.au.

Comment by Fisheries NSW
Fisheries NSW advise no issues.

For further information please contact Allan Lugg, Senior Fisheries Conservation Manager (Huskisson office) on 4428 3401, or at: Allan.Lugg@dpi.nsw.gov.au.

Comment by Crown Lands
Crown Lands advise that the overall mine area includes certain Crown land and that the proposed modification encroaches on land (Lot 7323 DP 1157291, part Travelling stock reserve) that is subject to an Aboriginal Land Claim and thus may limit the granting of any required tenure over that land. Early contact with Crown Lands should be made in this regard.

For further information please contact Melva Robb, Team Leader Land Administration (Griffith office) on 6960 3601, or at: melva.robb@lands.nsw.gov.au.

Comment by Office of Agricultural Sustainability & Food Security
The Office of Agricultural Sustainability & Food Security advises no issues.

For further information please contact Jo Powells, AIS officer (Orange office) on 6391 3885, or at: jo.powells@dpi.nsw.gov.au.

Yours sincerely

Tony Heffernan
Acting Executive Director Business Services

Attachment A

Cowal Gold Mine (DA 14/98)
Proposed Modification (Mod.11)

Additional comment by NSW Office of Water

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1. Water Supply and Management

- The project proposes no increase in annual water demand or changes to existing water sources. The proponent is requesting removal of the existing life of mine extraction limit of 30000 ML from the Bland Creek Paleochannel.
- It is understood the key modifications to water supply infrastructure include the following:
  - Additional dewatering bores as the extended open pit will require decommissioning of existing dewatering bores.
  - Installation of the eastern pump station to improve the capacity of the existing water supply pipeline.
  - Construction of a turkeys nest process water storage (D10) to a capacity of 1500ML.
- Existing water management and monitoring plans are proposed to be reviewed.

2. Groundwater Licensing

- The estimated groundwater inflows have defined the water take from the existing open cut mine to be approximately 182 ML/yr. This is estimated to comprise 10% from the alluvial groundwater system and 90% from the fractured rock system. The maximum predicted groundwater inflows from the modification proposal is 252 ML/yr with the same proportional split. As detailed in the section below on groundwater modelling, additional information is requested to justify this split.
- Post-mining inflows are predicted to total 46.3 ML/yr. This includes 44 ML/yr from the Lachlan Fold belt water source and 2.3 ML/yr from the Upper Lachlan Alluvial Water Source. Adequate licensed entitlement will need to be retained at the site to account for this ongoing take.
- Licensing under the *Water Act 1912* and/or *Water Management Act 2000* will be required for additional monitoring bores and dewatering bores.

3. Groundwater Impacts

- The Environmental Assessment (EA) has adequately addressed the Aquifer Interference (AI) Policy minimal impact considerations with respect to the Lachlan Fold Belt Water Source and falls within Level 1, which is defined as acceptable.
- Additional information is requested in support of predicted impacts to the water quality of the Upper Lachlan Alluvial Water Source. The existing water quality data appears to have been collected both prior to mining and during mining operations at the site. To substantiate that the beneficial use category at the site will not be lowered by the proposal it is necessary to review:
  (a) what water quality analytes were tested in which localities at the site, and
  (b) graphical presentation of historical select analyte concentration change with time at the site (including at a minimum TDS, As, CN, Pb, and Zn) from bores located in vicinity of existing open pits/underground workings and existing/proposed tailings facilities.
- The AI Policy requires that levee banks/landforms be constructed as appropriate to prevent at least a 1 in 100 year flood from entering the site either during or after operation. Whilst the protection level is not specifically discussed within the reports, the NSW Office of Water recognises the existing Site Water Management Plan specifies the Lake Isolation System and Up-Catchment Diversion System to be designed for a 1 in 1000 year ARI event.
- The continued use of the Bland Creek Paleochannel borefield (BCPB) and eastern saline borefield (ESB) during the life of the Cowal Gold Mine extension modification is not predicted to result in additional groundwater pressure head impacts in the Bland Creek Paleochannel.

Extraction is currently administered by existing approvals and licences under the *Water Management Act 2000* and a Groundwater Contingency Strategy in the Cowal Gold Mine Site Water Management Plan. These set a combination of daily and annual extraction limits in addition to trigger levels for the implementation of contingency measures to manage impacts on existing water users. The NSW Office of Water considers these arrangements are adequate to manage the extraction from the Bland Creek Paleochannel.

4. Groundwater Modelling

- The EA presents a numerical model that attempts to assess potential impacts to affected licensed water users and basic landholder rights by proposed activities at the site and off-site BCPB and ESB bore fields. Site model sensitivity analysis is described in EA Appendix A (Section 5.4.2.5) where vertical and horizontal hydraulic conductivities are increased by factor of two to simulate greater impacts to both Lake Cowal (due to increased leakage) and greater inflows to the pit, respectively. The analysis indicated that the site model heads and fluxes are sensitive to changes in both horizontal and vertical conductivity. Storage coefficient sensitivity analysis was not conducted for the site model.
- Whilst discussion of model assumptions is presented in Appendix A (Section 5.3.1.7), the site model provides very limited consideration of uncertainty analysis as required by the Australian Groundwater Modelling Guidelines (AGMG). Independent peer review by a hydrogeological firm (Kalf and Associates Pty Ltd) was conducted for both the site and off-site BCPB models as presented in EA Attachment 3. Although the review found the models to be Class 3 with some elements of Class 2, and deemed fit-for purpose, several model deficiencies can be drawn from the review:
  - A statistical measure of fit for calibration of the mine site model was not included.
  - Predictive uncertainty has not been quantified for both models, and is addressed by way of general comments only.
  - The mine site model does not provide a robust representation of the calibration results to understand whether it is sufficiently calibrated.
- Section 5.4.2.1 provides explanation of the modelled predictions of total inflow to the open pit at the site (during mining and post closure) including a percentage estimation of the proportion of groundwater flow contribution from transported unit (Upper Lachlan Alluvium) verses saprock/primary rock (Lachlan Fold Belt Fractured Rock). The proportion of water drawn from the transported unit (Upper Lachlan Alluvium) verses saprock/primary rock (Lachlan Fold Belt Fractured Rock) is given by way of statement, but no detailed water balance is given in support. EA Section 4.1.2 concludes that the inflow over the life of the mine will reach a maximum of approximately 228 ML/y from Fractured Rock (Lachlan Fold Belt) and 24 ML/y from alluvial groundwater system (Upper Lachlan Alluvium). A detailed summary of modelled outputs to confirm the volumes of take from each water source is requested.

5. Surface Water Impacts

- Section 4.2.2 of the main EA indicates the potential for the proposed access road to the eastern pump station to have potential impacts on flood waters. Due to insufficient information there is uncertainty as to whether this road will require a Part 8 approval under the *Water Act 1912* and the ability to mitigate potential impacts. It is therefore recommended a conceptual plan be provided with an assessment of potential impacts prior to determination of the project. Should approval under Part 8 be required, the proponent is encouraged to submit an application at the earliest possible opportunity to ensure minimal delays.
- Based on Figure B-15 in Appendix B the final rehabilitated water management system for the Cowal Gold Mine site is to retain the majority of runoff within the Internal Catchment Drainage System which will drain towards the final void. It is understood this will include runoff from rehabilitated areas in addition to the exposed walls of the final void. As it is generally recommended to separate clean and dirty/contaminated areas, further information is requested to justify the proposal to prevent clean runoff from re-entering the natural surface water system. This information will also aid in consideration of the applicability of the

Maximum Harvestable Rights Dam Capacity (MHRDC) for the property and any potential requirement for licensing under the Lachlan Unregulated and Alluvial Water Sharing Plan.

6. Monitoring and Management

- The Office of Water supports the proposed review of the Site Water Management Plan and the Surface Water, Groundwater, Meteorological and Biological Monitoring Programme.
- It is recommended data from the monitoring bores be used periodically for model calibration, predictions of mine inflow, and review of groundwater drawdown impacts. Comprehensive metering of all points of water take combined with water level monitoring is critical for reporting against water licence requirements, and supporting periodic reviews for model calibration, predictions of mine inflow, and review of groundwater drawdown impacts. This will aid in ensuring adequate water entitlement is held prior to the water take occurring and impacts are acceptable.

7. Recommended conditions of approval

Should the application be approved, the NSW Office of water recommends the following conditions:

- The proponent is required to obtain the necessary water licenses for the project under the *Water Act 1912* or *Water Management Act 2000* prior to commencement of activities.
- The proponent shall review the Surface Water, Groundwater, Meteorological and Biological Monitoring Programme in consultation with the NSW Office of Water.
- The Proponent shall review the Site Water Management Plan for the project. This Plan must be developed in consultation with the NSW Office of Water and include:
  - details of water use, metering and water management on site,
  - details of water licence requirements,
  - Surface Water Management Plan, and
  - Groundwater Management Plan.
- The Surface Water Management Plan must include:
  - a program to monitor:
    - surface water flows and quality,
    - surface water storage and use, and
    - sediment basin operation,
  - sediment and erosion control plans,
  - surface water impact assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts, and
  - a protocol for the investigation and mitigation of identified exceedences of the surface water impact assessment criteria.
- The Groundwater Management Plan must include:
  - baseline data on groundwater levels and quality,
  - a program to monitor groundwater levels and quality,
  - groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts,
  - a protocol for the investigation and mitigation of identified exceedences of the groundwater impact assessment criteria.
  - a protocol for periodic review of groundwater model calibration and verification of groundwater take predictions and groundwater impacts.

End Attachment A