ELEVENTH ANNUAL REPORT OF THE INDEPENDENT MONITORING PANEL FOR THE COWAL GOLD PROJECT – SEPTEMBER 2015

INTRODUCTION

The Independent Monitoring Panel (IMP) was established in accordance with condition 8.8(b) of the Development Consent for the Cowal Gold Project. The members of the IMP are:

- Emeritus Professor L Clive Bell, University of Queensland; former Executive Director, Australian Centre for Minerals Extension and Research (ACMER)
- Dr Craig Miller, Principal Environmental Scientist, CTM Consulting (Qld)
- a NSW Department of Planning and Environment representative

The IMP was established under the Development Consent to:

- provide an overview of the independent audits required under condition 8.8(a) of the Development Consent;
- regularly review all environmental monitoring procedures undertaken by the Applicant and monitoring results; and
- provide an Annual Statement of the Environment Report for Lake Cowal with particular reference to the ongoing interaction between the mine and the lake and any requirements of the Director-General.

The Director-General (Planning & Infrastructure) has not specified any requirements under condition 8.8(b)(ii) for the preparation of this report. This report covers site activities and environmental monitoring information provided to the IMP in the 2014 Annual Review (AR). The latter report was sent to the IMP on 7 August 2015 and covers the period 23 December 2013 to 22 December 2014.

This 2015 IMP Report includes the review of the Independent Environmental Audit Report (April 2015), prepared by Trevor Brown and Associates, for the period from July 2014 (when Development Consent 14/98 MOD 11 was granted) to April 2015 (Appendix 1), the most recent year being the ninth 12 months of operation. This audit was undertaken over the period from 20 April to 24 May 2015. The IMP also assessed additional material provided by Barrick Australia Ltd in the reports listed in Appendix 2.

The independent environmental auditors reviewed the available documentation covering (1) the implementation of the requirements of the development consent conditions (2) licenses and (3) approvals granted by Government for the project, as well as the environmental monitoring documentation held by Barrick at the mine site office in order to verify compliance with the conditions of approval.

As mentioned in previous IMP reports, the independent environmental auditors established a logical framework for verifying compliance by setting out the entire list of requirements, in the separate management plans that have been prepared by Barrick, that cover environmental management under the Minister's Conditions of Approval. These separate plans include:

- Indigenous Archaeology and Cultural Heritage Management Plan
- Heritage Management Plan
- Flora and Fauna Management Plan

- Erosion and Sediment Control Management Plan
- Soil Stripping Management Plan
- Rehabilitation Management Plan
- Biodiversity Offset Management Plan
- Bushfire Management Plan
- Land Management Plan
- Compensatory Wetland Management Plan
- Water Management Plan
- Cyanide Management Plan
- Hazardous Waste and Chemical Management Plan
- Air Quality Management Plan
- Blast Management Plan
- Noise Management Plan
- Traffic Management Plan

The compliance by Barrick against the requirements of the above-listed plans was assessed by the Independent Environmental Auditors, and comments were made against those approval conditions that had been activated. The scope of the Independent Environmental Audit dated April 2015 included the following components:

- review of the implementation of the requirements of the development consent conditions, licences and approvals for the operation of the mine and process plant;
- conduct of site inspections and review of on-site documentation and monitoring data relevant to the independent environmental audit;
- hold discussions with project staff in relation to the development consent conditions and implementation of the requirements;
- assess compliance of the Cowal Gold Mine project with the development consent conditions and other environmental conditions; and
- prepare an Independent Environmental Audit Report providing assessment of compliance against each consent conditions.

The IMP has reviewed the reporting process used in the Independent Environmental Audit Report of April 2015. The IMP was easily able to assess and verify the status of environmental management information at the site and the general compliance with development consent conditions, licences and approvals granted to Barrick, as reported by the independent environmental auditors. Overall, it is a well-structured and informative report prepared in accordance with the Australian/New Zealand Standards AS/NZS ISO 19011:2002 – Guidelines for Quality and/or Environmental Management System Auditing.

The Independent Environmental Auditors (aemc) drew the following conclusion in their April 2015 report (p.110):

The audit findings confirm an overall high standard of general compliance with the Minister's Conditions of Approval, Environmental Protection Licence and requirements of the environmental conditions attached to the Mining Lease 1535.

Overall the IMP concurs with this assessment based upon its review of all available documents, and the site visit on 29 August 2015. Specific areas for possible improvement are considered below.

REVIEW OF CGM'S RESPONSE TO THE 2014 IMP REPORT

The IMP made four recommendations in the 2014 IMP Report concerning environmental monitoring procedures sent to the Department of Planning and Infrastructure on 14 October 2014. The department forwarded this report to the Cowal Gold Mine (CGM), and this was received on 1 December 2014. These recommendations are assessed below in terms of adequacy of the response by CGM outlined in the 2014 Annual Review (7 August 2015), and new recommendations are made where required.

2014 IMP Report Recommendation 1

CGM should continue to monitor all existing rehabilitation trials and those to be established in 2014/2015 (direct-seeded native species areas) with a view to continually refine its approach to achieving large-scale sustainable rehabilitation. Particular attention should be paid to the landform design, rehabilitation materials, rehabilitation cover system and revegetation concepts defined in the 2014 CGM Rehabilitation Risk Assessment (draft of May 2014).

In response to the above recommendation, CGM replied -

"Barrick will continue to engage independent specialists, DnA Environmental, to monitor all existing rehabilitation trial areas, in particular the NWE rehabilitation trial area, to determine the most effective applications of the rock mulch, topsoil and hay cover system, and to assess the performance of the selected Eucalypt and Acacia revegetation species.

2014 Rehabilitation Risk Assessment

Barrick's *2014 Rehabilitation Risk Assessment* (RRA) describes the approved rehabilitation strategy for the CGM, including the landform design, rehabilitation materials, rehabilitation cover system concepts and revegetation concepts, as described in the *Cowal Gold Mine Extension Modification Environmental Assessment Rehabilitation Proposal* (Barrick 2013). The RRA involved a qualitative assessment and evaluation of potential risks associated with the successful rehabilitation of the approved CGM rehabilitation strategy. Risk treatment measures were proposed, where required, to reduce the level of risk. The key risk treatment measures identified in the RRA include:

- Armouring batter slopes and berms with benign primary waste rock, cross-ripping with approximately 10t/ha gypsum-treated topsoil along the contour to minimise erosion potential and spreading native pasture hay (approximately 5 centimetres deep) to improve slope stability and establish initial cover crop.
- Applying approximately 10 tonnes per hectare (t/ha) gypsum to oxide waste rock surfaces (on berms and batter slopes) prior to application of rock mulch and gypsum-treated topsoil to reduce dispersive nature of oxide waste material and minimise erosion potential.
- Deep-ripping and applying gypsum (or other relevant treatment) to soil stockpiles in accordance with relevant application rate outlined in McKenzie Soil Management's (2013) *Cowal Gold Mine Soil Stockpile Characterisation Report*. Once soil testing indicates it is suitable for rehabilitation use, strip the top layer and repeat process.

- Constructing the TSF rock buttressing in accordance with approved design concepts for TSFs (i.e. overall slope angle of 1 vertical:5 horizontal) and avoiding use of angle of repose.
- Rock armouring the outer batter slope of the Temporary Isolation Bund to stabilise and maintain integrity of bund in the long-term.

During the 2014 RRA workshop, the success and suitability of a number of the risk treatment measures were determined to be uncertain due the further requirement for trial results and/or further research. Recommendations to address these uncertainties are as follows:

1. Undertake erosion modelling to assist with determining optimal depth of primary rock mulch which would minimise erosion potential on final landform slopes.
2. Conduct Northern Waste Rock Emplacement (D1) rehabilitation trial to inform:

- effectiveness of 300 millimetres (mm) deep layer of primary rock in stabilising and minimising erosion potential on final landform slopes;
- effectiveness of 150 mm, 200 mm and 300 mm deep layer of topsoil as a suitable growth medium which can support long-term vegetation growth;
- effectiveness of a 5 centimetres layer of seed-bearing native pasture hay versus clean wheaten straw hay in protecting the soil resource, minimising erosion potential and increasing the potential for germination of native grass and ground cover species; and
- performance of select Eucalyptus and Acacia plant species grown in the various rehabilitation material combinations.

3. Conduct vegetation growth trial to evaluate performance of select tree and shrub species grown in various combinations of rehabilitation materials which reflect the cover system for the top surfaces of the waste rock emplacements and TSFs. Trial to also evaluate the effectiveness of a 200 mm deep capillary break layer of primary rock versus a 450 mm deep capillary break layer in minimising salt rise.
4. Develop a revised soil stockpile management strategy including a soil requirement schedule to determine when (and how much) soil is required for proposed short-term and long-term rehabilitation activities. Conduct a cost benefit analysis of options including treating soil at a higher rate on rehabilitation areas, stripping soil to a depth to achieve a soil surplus, treating soil stockpiles in-situ and implementation of small scale soil amelioration farm (on the top surface of the southern waste rock emplacement) to determine preferred approach for minimising the potential of a soil deficit occurring or a delay to availability of suitable soil stocks.
5. Prepare a materials balance to determine availability and likely volumes of benign (i.e. non-acid forming, non-saline and non-dispersive) primary waste rock for rock buttressing the TSF embankments, for armouring waste rock emplacement, TSF, Temporary Isolation Bund and Lake Protection Bund batter slopes and for use as a capillary break on the surface of the TSFs. .
6. Evaluate soil analysis results for existing and new rehabilitation areas, the Northern Waste Rock Emplacement trial and proposed vegetation growth

trial to investigate the natural soil leaching process where Electrical Conductivity levels in soil decline over time. Investigation to also assess vegetation performance and inform suitability of revegetation species to highly saline soils.

7. Prior to mine closure, develop detailed design for rehabilitation of the top surfaces of the TSFs. Design to consider results of water balance modelling which has assessed likely quantity, quality and expected duration of surface water ponding.
8. Re-assess relevant rehabilitation reference sites for waste rock emplacement, TSF and Lake Protection Bund and Temporary Isolation Bund batter slopes to confirm they are appropriate benchmarks for the relevant CGM final landform due to the introduction of rock mulch/rock armour into the substrate profile for these landforms.
9. Develop a whole of rehabilitation programme seed supply strategy. Strategy to involve collecting local endemic species likely suitable for revegetation of CGM final landforms (including the New Lake Foreshore, low slopes, ridges and hills, and grassland areas). Strategy to identify estimated seed and tubestock quantities anticipated to achieve rehabilitation completion criteria.
10. Monitor performance (germination rate) of first waste rock emplacement direct seeding campaign to confirm effectiveness of direct seeding method.

Barrick will continue to annually track the progress of implementation of the RRA recommendations, and assess the performance of the CGM's approved rehabilitation strategy based on review of the CGM's rehabilitation monitoring programme results."

2015 IMP Assessment 1:

The 2014 Rehabilitation Risk Assessment provides a sound basis for identifying the key aspects that need to be focussed on to ensure sustainable rehabilitation which meets government and community expectations.

During the mine visit, the IMP noted the good establishment of trees and shrubs in the Northern Waste Rock Emplacement Rehabilitation Trial and the quantitative data on plant survival in the DnA Environmental report of February 2015. It was also noted that the surface stability was very good, helped no doubt by the vigorous growth of annual rye grass, the seed of which would have been in the stored topsoil. The grass would be expected to die over the summer months leaving a thick mulch layer.

The presence of the rye grass, while assisting in the stabilisation of the soil surface in the early stages of rehabilitation, may hinder efforts to establish native shrubs and trees by direct seeding in the future. Methods of knocking out the rye grass, after the initial growth and stabilisation of the surface, need to be researched so that direct seeding of native species will be successful. This latter technique will be required to achieve the large scale rehabilitation of the waste rock dumps and tailings storage facilities in the future.

Direct seeding of native species in the Northern Waste Emplacement Trial was omitted to reduce the complexity of the trial, but a commitment was made to direct seed 12 ha of the inner batters of the Perimeter Waste Emplacement in late 2014/early 2015. This did not occur because this area may have to be disturbed as part of the mining plan.

2015 IMP Recommendation 1*: CGM should establish a research trial to investigate the most efficient method of controlling rye grass allowing for the successful establishment of native plant species by direct seeding.*

2014 IMP Report Recommendation 2: *That watering continue over summer until seedlings have established their roots, and that plant available water in the soil be monitored to guide watering if above average dry conditions continue.*

In response to this recommendation, CGM replied -

"Barrick watered the tubestock planted on the NWE rehabilitation trial area in August 2014 for a eight month period (over summer) through to April 2015.

Barrick will engage DnA Environmental to incorporate the assessment of plant available water in the soil into the rehabilitation monitoring programme for the NWE trial to guide the future requirement for watering."

2014 IMP Report Recommendation 3: *That raising of the TIB is conducted in a manner that ensures protection of the naturally recruited river red gum saplings and swale habitats.*

In response to this recommendation, CGM replied -

"Barrick, with input from DnA Environmental, will review the approach for works to raise the height of the TIB by 0.5 m to protect the naturally recruited vegetation and swale habitats as far as practicable."

2014 IMP Report Recommendation 4: *That the requirement to deconstruct or breach the TIB be reconsidered based on an assessment of the naturally developing habitat and biodiversity values of the structure.*

In response, CGM replied -

"As a part of the next rehabilitation risk assessment undertaken for the CGM and any future mine closure planning activities, Barrick will review the currently approved rehabilitation strategy for the Temporary Isolation Bund in consideration of the naturally developing habitat and biodiversity value that has developed surrounding the bund."

Additional Issue Raised by 2014 IMP Report

The IMP also notes that care must be taken when planting tubestock to ensure that the root mass is planted into substrate. We observed instances where the root mass was suspended in the hay mulch, possibly due to the speed of planting; these seedlings will die. More care is required in the balance between speed of planting and effectiveness of planting.

In response, CGM replied -

"Barrick will develop a revegetation planting procedure for any future revegetation campaigns at the CGM. The procedure will include directions such as planting tubestock within 'trough' areas and planting tubestock at a sufficient depth within the substrate. All relevant CGM staff and contractors will be trained in the procedure prior to implementation of the planting campaign. The procedure will involve a follow-up

inspection of planted tubestock by the CGM Environmental Department to confirm all tubestock have been planted appropriately."

The IMP is satisfied with the detailed responses to its recommendations.

ADDITIONAL ISSUES IDENTIFIED BY THE IMP IN THE 2014 ANNUAL REVIEW AND SITE VISIT

2015 IMP Assessment 2:

Whereas the establishment of a stable vegetative cover on waste rock to date appears to be able to be achieved using a combination of topsoil, rock and gypsum without the need for subsoil, the IMP considers that it would be prudent for the mine to proceed with the Substrate Profile Trial (described in the Tenth Annual IMP Report) to assess the value of topsoil/subsoil combinations. This trial, using 1m x 1m x 2m boxes, was to have commenced in October 2014 subject to suitable weather conditions. Unfortunately rainfall has been well below average for the past year.

Although detailed inventories of soil inventories are kept and give confidence to future decisions on the use of topsoil in rehabilitation, any changes that may occur in future mining activities may necessitate the need for more soil, and thus surface/subsoil combinations may be required.

2015 IMP Recommendation 2: *Every effort should be made to commence the waste rock component of the Substrate Profile Trial as soon as weather conditions permit in order to gain additional information about the value of including subsoil in future rehabilitation.*

2015 IMP Assessment 3:

The IMP notes that data on gypsum requirement in the Cowal Gold Mine Soil Stockpile Characterisation Report (2013) by McKenzie Soil Management is being used to ameliorate soils used in the rehabilitation program. However, there does not appear to be data available on the quality of gypsum currently being purchased by the mine. If the material being used is not 100% gypsum, the rates used to reduce the exchangeable Na levels in the soils, used in the rehabilitation program, may have to be increased to achieve the desired effect on dispersion.

2015 IMP Recommendation 3: *CGM should obtain an analysis of the gypsum product from the suppliers and additionally send a representative sample to an analytical laboratory for (1) a Ca and S analysis to confirm the percentage of gypsum in the product and (2) an X-ray diffraction analysis to identify any mineral contaminants.*

2015 IMP Assessment 4:

The IMP visited the mine in a wet period after approximately 60 mm of rain had fallen in the previous 5 days. It was noted on the Southern Waste Rock Emplacement that no berms had overtopped but that there was some ponding on these berms. Whereas the capacity of the reverse sloping berms appears to be large, it would be prudent for CGM to calculate the runoff between berms for different rainfall recurrence intervals in order to assess the risk of overtopping and possible berm failure in the future.

2015 Recommendation 4: *CGM should calculate, for the current spacing between berms on the waste rock dumps, the runoff for different recurrence intervals and compare this with the estimated berm capacity to provide confidence in the current design parameters for erosion control and dump stability.*

2015 IMP Assessment 5:

The Annual Review Report still shows that excessively high dust analysis results for some metals such as zinc and copper are being recorded in spite of a range of measures being instituted to identify whether the issue is a contamination or an analytical one.

2015 Recommendation 5: *CGM should continue to liaise with Assoc Prof Stephen Cattle, University of Sydney, who conducts the dust analyses for the mine, to ensure that the matter of apparently high metal analyses in dust samples is resolved.*

New Ownership

Further, the IMP understands that the mine is no longer owned by Barrick, having been purchased by Evolution Mining. Consequently future IMP reports will refer to Evolution Mining in place of Barrick. The IMP met informally with Evolution Mining's new Group Manager – Environment and Sustainability, and impressed upon him the quality of environmental management at the site to date, and the expectation that the standards would not decline under the new ownership.

ANNUAL STATE OF THE ENVIRONMENT REPORT FOR LAKE COWAL

Lake Cowal has remained empty since the last visit of the IMP in 2014, and farming has recommenced in the lake bed. Recent heavy rain has created areas of localised surface flooding, but this will not result in the lake filling again.

The IMP notes that monitoring undertaken during the period when the lake was most recently full demonstrated that activities in the Cowal Gold Mine had no effect on water quality or biodiversity. The quality of the lake's water was a function of upstream, surrounding, and in-lake-bed land use, and was observed to further diminish as expected when the lake began drying.

Water bird use of the region as breeding habitat has ceased now that the lake is empty. The breeding season appeared to be successful with no incidents of unexpected or mass mortality in chicks and fledglings.

The IMP again notes the successful recruitment and growth of river red gum and other native woody species on the Temporary Isolation Bund (TIB). The success of this regrowth is largely due to the protection of the Cowal Mine site from grazing by domestic stock. It further reinforces the value of the TIB as lakeshore habitat and that it will provide increased amenity value and visual buffering of the mine from the lake.

SUMMARY OF 2015 IMP RECOMMENDATIONS

2015 IMP Recommendation 1*: CGM should establish a research trial to investigate the most efficient method of controlling rye grass allowing for the successful establishment of native plant species by direct seeding.*

2015 IMP Recommendation 2: *Every effort should be made to commence the waste rock component of the Substrate Profile Trial as soon as weather conditions permit in order to gain additional information about the value of including subsoil in future rehabilitation.*

2015 IMP Recommendation 3: *CGM should obtain an analysis of the gypsum product from the suppliers and additionally send a representative sample to an analytical laboratory for (1) a Ca and S analysis to confirm the percentage of gypsum in the product and (2) an X-ray diffraction analysis to identify any mineral contaminants.*

2015 Recommendation 4: *CGM should calculate, for the current spacing between berms on the waste rock dumps, the runoff for different recurrence intervals and compare this with the estimated berm capacity to provide confidence in the current design parameters for erosion control and dump stability.*

2015 Recommendation 5: *CGM should continue to liaise with Assoc Prof Stephen Cattle, University of Sydney, who conducts the dust analyses for the mine, to ensure that the matter of apparently high metal analyses in dust samples is resolved.*

INDEPENDENT MONITORING PANEL

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APPENDIX 1 - OVERVIEW OF THE INDEPENDENT ENVIRONMENTAL AUDIT (IEA)

Under the Minister's Condition of Approval (MCoA) (26 February 1999), an Independent Environmental Audit was to be completed:

- six-monthly during construction;
- 12 months after commencement of ore processing;
- then every three years thereafter until decommissioning of the mine and ore processing operations, respectively, or as otherwise directed by the Director-General.

In its report of August 2007, the IMP recognised that the template-based approach, that had been used by Trevor Brown and Associates applied environmental management consultants (aemc) in the four six-monthly reports leading up to the 2007 IMP reporting period, was well-structured for addressing complex environmental compliance requirements, and was a good example of best practice for easily accessible and updated environmental compliance information. Thus the IMP made the recommendation that "Barrick consider continuing use of the template-based approach established by aemc for

environmental auditing of operations in order to regularly and systematically update progress on each of the environmental management and monitoring components. This approach would greatly assist the IMP in its annual review."

APPENDIX 2 – LIST OF REPORTS ASSESSED BY INDEPENDENT MONITORING PANEL

Cowal Gold Mine – 2014 Annual Review Report (August 2015). Barrick Australia Limited.

Independent Environmental Audit – Cowal Gold Mine (April 2015). Trevor Brown and Associates .

Northern Waste Rock Emplacement Rehabilitation Trials. Prepared for Cowal Gold Mine. February 2015. DnA Environmental.

2014 Rehabilitation Monitoring Report for Cowal Gold Mine. January 2015. DnA Environmental.

Interpretation and Discussion of 2014 Air Quality Monitoring Results – Cowal Gold Project. Assoc Prof Stephen Cattle, The University of Sydney.

Environmental Bund Inspection Audit Report 2015 – Barrick Cowal Gold Mine (2015). Extrin Pty Ltd.

Cowal Gold Mine 2014 Rehabilitation Risk Assessment (Draft). Barrick Cowal Gold Mine. May 2014.

2014 CGM Mine Closure Plan. Barrick Cowal Gold Mine. December 2014.