

# THIRTEENTH ANNUAL REPORT OF THE INDEPENDENT MONITORING PANEL FOR THE COWAL GOLD PROJECT – NOVEMBER 2017

## 2017 IMP RECOMMENDATIONS

**Recommendation 1:** *CGM should ensure the direct seeding trial is adequately monitored, and be willing to incorporate additional treatments (such as the use of selective herbicides) in the trial if a review of literature identifies potential benefits.*

**Recommendation 2:** *CGM should make every effort to establish the Substrate Profile Trial on the surface of the Southern Waste Rock Emplacement (SWRE) as soon as a site becomes available in 2018.*

**Recommendation 3:** *CGM to report metal concentrations in dust samples in the 2017 Annual Review.*

**Recommendation 4:** *CGM should ensure that effective rehabilitation is a KPI for the senior decision maker in the mining division.*

**Recommendation 5:** *CGM to ensure that Standard Operating Procedures are followed for revegetation and that procedures are in place to cover gaps in staff capability or capacity to deliver rehabilitation activities.*

**Recommendation 6:** *CGM should give consideration to making an application to government to remove the requirement to conduct an annual Austral Pilwort survey.*

**Recommendation 7:** *CGM explore the options for a coordinated program of Lippia control around Lake Cowal, with the Lake Cowal Foundation and the local Council*

**Recommendation 8:** *CGM to record the IMP's recommendations in the 2017 Annual Review.*

## INTRODUCTION

The 2017 Independent Monitoring Panel (IMP; Appendix 1) reviewed:

- The Independent Environmental Audit Report (May 2017; Appendix 2), prepared by Trevor Brown and Robert Drury of Trevor Brown and Associates. The Independent Environmental Audit Report covered the period from 1 May 2016 to 30 April 2017, the most recent year being the eleventh 12 months of operation of the Cowal Gold Mine (CGM).
- Site activities and environmental monitoring information provided to the IMP in Technical Reports (Appendix 3) and the 2016 Annual Review (AR) dated 27 July 2017 and covering the period 1 January 2016 to 31 December 2016.

The IMP visited the Cowal Gold Mine on 28 September 2017 to examine progress on rehabilitation and other environmental management activities, and discuss operations with Environmental Management staff.

## **ASSESSMENT OF COMPLIANCE**

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 Evolution Mining at the mine site office in order to verify compliance with the conditions of approval.

The compliance by Evolution Mining against the requirements of the plans listed in Appendix 2 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 May 2017 included the following components:

- review of the implementation of the requirements of the development consent conditions, and other environmental licences and approvals with environmental conditions for the operation of the Cowal Gold Operations;
- 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 Operations with the Development Consent conditions and other environmental approval conditions; and
- prepare an Independent Environmental Audit Report providing assessment of compliance against the environmental conditions.

The IMP has reviewed the reporting process used in the Independent Environmental Audit Report of May 2017. 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 Evolution Mining, 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 19011:2014 – Guidelines for Auditing Management Systems and the Independent Audit Guideline (Department of Planning and Environment, October 2015).

The Independent Environmental Auditors drew the following conclusion in their May 2017 report (Executive Summary):

*The Cowal Gold Operations are being developed generally in accordance with the Environmental Assessments and generally demonstrate a high level of compliance with Consolidated Development Consent 14/98 MOD 13.*

Overall the IMP concurs with this assessment based upon its review of all available documents, and the site visit on 28 September 2017. Specific areas for possible improvement are considered below.

## **REVIEW OF ENVIRONMENTAL MANAGEMENT**

The IMP made three recommendations in the 2016 IMP Report concerning environmental management issues sent to the Department of Planning and Environment on 26 October 2016 and subsequently sent by the Department to the Cowal Gold Mine. These recommendations are assessed below in terms of the

adequacy of the response by CGM, forwarded to the Department of Planning and Environment on 24 March 2017.

**Recommendation 1:** *CCM 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, as first recommended in 2015. The trial design should be developed following a literature review on methods of establishing native species by direct seeding in the presence of rye and other exotic grasses.*

In response to the above recommendation, CGM replied -

“Evolution, with assistance from independent revegetation/rehabilitation specialists DnA Environmental and Global Soil Systems, has designed 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.

The trial will be established over a hectare on the upper South-Western slopes of the Southern waste rock emplacement and upper North-Eastern slopes of the Northern waste rock emplacement.

The trial will involve two experiments:

**Experiment 1** will involve immediate application of a native seed mix onto the newly profiled waste rock emplacement surface prior to any germination or establishment of Rye Grass. Experiment 1 will assess the effectiveness of immediate native seed application following the profiling of the waste rock emplacement surface.

**Experiment 2** will involve application of a native seed mix once a Rye Grass cover and mulch/litter layer has been established. Experiment 2 will assess the effectiveness of cultivation (i.e. deep ripping) of the surface to create bare gaps amongst the Rye Grass for seedling establishment whilst retaining the protective mulch/litter cover.

Evolution has finalised the trial design with DnA Environmental and Global Soil Systems and the trial commenced in mid-March 2017.

Notwithstanding, Evolution will undertake a literature review on the methods of establishing native species via direct seeding in the presence of Rye Grass and other exotic grass species, with assistance from DnA Environmental and Global Soil Systems (as required). The literature review is anticipated to include rehabilitation studies and trials undertaken at other project sites.

Following the completion of this literature review, and if required, the trial design will be augmented in consultation with DnA Environmental and Global Soil Systems. The final design of the trial (including a conceptual view of the trial plots) will be included in the CGO’s 2017 Annual Review.

Monitoring of the trial area will be conducted by DnA Environmental in accordance with the CGO’s existing rehabilitation monitoring programme methodology. Results of the trial will be reported in DnA Environmental’s annual rehabilitation monitoring report and in the CGO’s Annual Reviews.”

#### **IMP Response:**

The IMP is satisfied with this response. During the mine visit in September 2017, the IMP noted that the rye grass trial had commenced. Dry conditions had been experienced since the seeding with native species, and monitoring of the trial was

expected to be undertaken by DnA Environmental in November. The IMP notes that a commitment has been made to undertake a review of methods of establishing native species by direct seeding in the presence of rye grass which may result in additional treatments being added to the trial (e.g. use of selective herbicides).

**2017 IMP Recommendation 1:** *CGM should ensure the direct seeding trial is adequately monitored, and be willing to incorporate additional treatments (such as the use of selective herbicides) in the trial if a review of literature identifies potential benefits.*

**2016 IMP Recommendation 2:** *CCM should (1) endeavour to establish the Substrate Profile Trial in boxes (described in the 10th Annual IMP Report) giving due consideration to the practicalities of watering in dry seasons and (2) excavate near established native trees and shrubs in the SWRE trials to determine root growth into subsoil materials and document the pH and EC trends in each profile. Results from these experiments should provide CGM with essential data on subsoil properties for future rehabilitation planning.*

In response to the above recommendation, CGM replied -

1. "Evolution is finalising the design of the waste rock component of the Substrate Profile Trial with DnA Environmental and anticipates commencing the trial in June 2018. As the Southern waste rock emplacement is anticipated to reach its final height in June 2018, the waste rock component of the Substrate Profile Trial would be implemented on an area on the top surface of the emplacement, negating the need to use the trial boxes. The trial will involve the application of a number of cover systems and substrate treatments. Select native tree and shrub species would be planted in the substrate treatments and the trial monitored to assess plant growth, with root system development analysed at the completion of the trial.
2. Evolution undertook an investigation during November 2016 into the root penetration of tubestock on the Northern waste rock emplacement. Initial results have indicated that the roots are not particularly influenced by the depth of the topsoil. Rather it appeared that the underlying hard and compacted oxide layer was providing a physical (rather than a chemical) barrier resulting in the tree and shrubs roots growing laterally on top of this oxide layer. Root penetration and soil characteristics, including pH and EC, will continue to be monitored as part of the rehabilitation monitoring programme in order to understand the long-term implications of substrate layers on the health and longevity of trees and shrubs."

#### **IMP Response:**

The establishment of the Substrate Profile Trial on the top of the Southern Waste Rock Emplacement will be preferable to the use of planter boxes, and the postponement of the trial to June 2018, when an appropriate area becomes available, is justified. CGM needs to make sure that the site selected will not be impacted by future waste rock dumping to ensure that sufficient data on the value of saved subsoil can be derived to assist in future large-scale rehabilitation.

**2017 IMP Recommendation 2:** *CGM should make every effort to establish the Substrate Profile Trial on the surface of the Southern Waste Rock Emplacement (SWRE) as soon as a site becomes available in 2018.*

**2016 IMP Recommendation 3:** *CGM should (1) ensure suppliers of bulk gypsum provide an analysis of gypsum purity with each bulk shipment and (2) recalculate the appropriate rate of gypsum to add to the various topsoil and subsoil materials*

*to ensure the rates meet the specifications provided by McKenzie Pty Ltd in its 2013 report on "Soil Stockpile Characterisation Assessment".*

In response to this recommendation, CGM replied –

1. "Evolution has obtained an analysis of a number of gypsum products from suppliers and will select a gypsum product based on the analysis and recommendations from the "Soil Stockpile Characterisation Assessment". Evolution will implement a quality assurance program for the selected gypsum product by periodically sending a representative sample from the delivered gypsum to a laboratory for analysis.
2. Gypsum application rates will be calculated based on the analysis of the gypsum product, the results from the quality assurance program and recommendations from the "Soil Stockpile Characterisation Assessment."

### **IMP Response**

The IMP is satisfied with this response, and urges CGM to obtain an analysis on purchased gypsum if ever the source and/or supplier changes.

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

#### **Lack of Information in Annual Review on Metal Concentrations in Dust**

In previous years, the levels of a range of metals in dust samples have been documented in the Annual Review. However, there was no information on dust metal concentrations in the 2016 Annual Review. The IMP has pointed to anomalous (high) values of some metals in dust samples over a number of years and has consistently recommended that the reason for these anomalous results be investigated by liaising with Assoc. Prof Stephen Cattle, University of Sydney, who has been responsible for undertaking the dust analyses. It would appear that the analytical difficulties responsible for the apparently high values for copper and zinc have been overcome as evidenced by the fact that no anomalous values for these elements in dust were recorded in the 2015 Annual Review. It would have been useful to the IMP if metal analyses in dust could have been recorded in the 2016 Annual Review to enable confirmation that anomalous metal concentrations are no longer being recorded.

**2017 IMP Recommendation 3:** *CGM to report metal concentrations in dust samples in the 2017 Annual Review.*

#### **Rehabilitation Progress and Quality Control**

Over the past 2 years, CGM appears to have improved the rate of rehabilitation, despite adverse weather conditions, through the provision of a dedicated full-time dozer and operator. This provision meant that the quality of the recontoured areas (slopes, soil and rock substrate, and gypsum application) prior to establishment of vegetation has improved. However, during the 2017 site visit by the IMP, several issues were identified which have the potential to affect the future progress and quality control if not adequately monitored.

It was noted that the dedicated dozer and operator are no longer available for the rehabilitation program, with the site's mining division taking over the responsibility for the land preparation prior to planting. Members of the IMP have observed that at some mines in Australia the progress and quality control of the rehabilitation can suffer, where the rehabilitation section does not have its own dedicated machinery and

operators. This is because mine production activities are typically prioritised over rehabilitation activities, and critical times for rehabilitation activities can be missed. In other cases, it has worked, particularly where rehabilitation KPIs of senior managers have appropriate weighting so that planning, scheduling, and resource allocation are carefully considered and applied. Training of senior mine production managers in the critical requirements of rehabilitation may be required.

**2017 IMP Recommendation 4:** *CGM should ensure that effective rehabilitation is a KPI for the senior decision maker in the mining division.*

During the site visit, it was noted that a substantial revegetation effort on the Northern Waste Rock Emplacement had 100% mortality, because the seedlings were not watered at planting. There is an obvious monetary loss in this case, but additionally there is the loss of a year's growth in a part of the mine's rehabilitation program. The IMP notes that this was due to personnel changes and inadequate scheduling of required rehabilitation activities. Staff inexperience may also have contributed to this.

**2017 IMP Recommendation 5:** *CGM to ensure that Standard Operating Procedures are followed for revegetation and that procedures are in place to cover gaps in staff capability or capacity to deliver rehabilitation activities.*

The IMP notes that annual surveys since 2006 have failed to find Austral Pillwort on ML 1535 and adjacent properties. The conditions specified in the Cowal Gold Operations Flora and Fauna Management Plan and Threatened Species Management Protocol (Resource Strategies Pty. Ltd. 2003a, 2003b) required annual surveys to identify:

"The occurrence of Austral Pillwort within ML 1535 and immediate surrounds not disturbed by the Project will be monitored annually. An estimate of the abundance of the Austral Pillwort will be recorded. The location of the Austral Pillwort will also be recorded using a GPS. Observations of the health of the specimens will also be recorded (eg. leaf yellowing etc.)."

The IMP questions whether CGM should be required to continue to conduct these surveys. The land surveyed is unaffected by mining, and stock grazing has been removed from ML 1535. Grazing continues on the adjacent properties. Therefore, there is some other factor responsible for the dynamics of Austral Pillwort in this region, and the surveys are not set up to determine what those factors are. This would require a specific research project across a wider area, and the IMP considers that CGM is not responsible for doing this.

Should the surveys continue, a future finding of Austral Pillwort will provide no information of relevance or use to management, other than knowing that it is there.

**2017 IMP Recommendation 6:** *CGM should give consideration to making an application to government to remove the requirement to conduct an annual Austral Pillwort survey.*

The IMP agrees with DnA Environmental (RVEP Monitoring Report 2016) that the weed Lippia should be controlled at the lake edges. While CGM could undertake control on its mining lease, control would also be required on other properties to have a sustained impact. The IMP notes that the responsibility for control of this Class 4 weed lies with landowners, however the local Council can issue a weed control notice to landowners.

A coordinated voluntary control program supported by the Council is likely to have greater uptake by landowners than an order. CGM may wish to explore the desirability

and likelihood of such a program through the Lake Cowal Foundation and the local Council.

**2017 IMP Recommendation 7:** *CGM explore the options for a coordinated program of Lippia control around Lake Cowal, with the Lake Cowal Foundation and the local Council*

It was noted by the IMP that there was no reference to the IMP or its recommendations in the 2016 Annual Review. Hopefully this omission will be addressed in next year's Annual Review.

**2017 IMP Recommendation 8:** *CGM to record the IMP's recommendations in the 2017 Annual Review.*

## **ANNUAL STATE OF THE ENVIRONMENT REPORT FOR LAKE COWAL**

The IMP notes that the Cowal Gold Mine and Lake Cowal remain hydrologically separated.

The recruitment and growth of river red gums and other lake riparian woody species continues on the lake edge and the Temporary Isolation Bund. The absence of stock grazing has allowed this regeneration to occur as prolifically as it has, in comparison to grazed sites elsewhere around the lake. This lakeside vegetation will self-thin at some point in the next decade due to density-dependent processes. It is anticipated that the growth of large river red gums on the lake margin will add to aesthetic (screening) and habitat values. A key function of this vegetation will be to provide ecological connectivity to habitat north and south of the mine.

## **APPENDIX 1 - THE INDEPENDENT MONITORING PANEL (IMP)**

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
- 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 & Environment) has not specified any requirements under condition 8.8(b)(ii) for the preparation of this report.

## **APPENDIX 2 - 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."

The plans reviewed for compliance include:

- Indigenous Archaeology and Cultural Heritage Management Plan
- Non-Indigenous 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

### **APPENDIX 3 – LIST OF REPORTS ASSESSED BY INDEPENDENT MONITORING PANEL**

Cowal Gold Mine – 2016 Annual Review Report (July 2017). Evolution Mining.

Independent Environmental Audit – Cowal Gold Mine (May 2017). Trevor Brown and Associates.

Northern Waste Rock Emplacement Rehabilitation Trials. February 2017. DnA Environmental.

2016 Rehabilitation Monitoring Report for Cowal Gold Mine. February 2017. DnA Environmental.

2016 Compensatory Wetland Monitoring Report. February 2017. DnA Environmental.

2016 Remnant Vegetation Enhancement Program Monitoring Report. February 2017. DnA Environmental.

2015 Austral Pillwort Survey. February 2016. DnA Environmental.