



COWAL GOLD MINE E42 MODIFICATION
ENVIRONMENTAL ASSESSMENT

SECTION 6 - STATEMENT OF COMMITMENTS

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TABLE OF CONTENTS

6	DRAFT STATEMENT OF COMMITMENTS	SOC-1
6.1	ENVIRONMENTAL MITIGATION	SOC-1
6.1.1	Aboriginal Cultural Heritage	SOC-1
6.1.2	Non-Aboriginal Heritage	SOC-1
6.2	ENVIRONMENTAL MANAGEMENT	SOC-2
6.3	REPORTING	SOC-5
6.3.1	Mining Operations Plan	SOC-5
6.3.2	Annual Environmental Management Report	SOC-6
6.3.3	Independent Monitoring Panel	SOC-6
6.3.4	Independent Environmental Audit	SOC-6
6.4	MONITORING	SOC-6

LIST OF TABLES

Table SOC-1	Overview of the Environmental Monitoring Programme
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LIST OF FIGURES

Figure SOC-1	Noise, Blast and Dust Monitoring Locations
Figure SOC-2	ML1535 Surface Water and Groundwater Monitoring Locations
Figure SOC-3	Lake Water and Regional Groundwater Monitoring Locations

6 DRAFT STATEMENT OF COMMITMENTS

6.1 ENVIRONMENTAL MITIGATION

Environmental mitigation measures to be implemented for the modified Cowal Gold Mine (CGM) are described in the following sections of the Environmental Assessment (EA):

- Land Resources – Section 4.2.3.
- Visual Character – Section 4.3.3.
- Hydrogeology – Section 4.4.3.
- Surface Water – Section 4.5.3.
- Flora – Section 4.6.3.
- Fauna – Section 4.7.3.
- Noise – Section 4.8.3.
- Air Quality – Section 4.9.3.
- Transport – Section 4.10.3.
- Aboriginal Cultural Heritage – Section 4.11.3.
- Non-Aboriginal Heritage – Section 4.12.3.
- Hazard and Risk – Section 4.15.3.

Specific management measures to be implemented for the modified CGM which are either not described in existing management plans, or not proposed to be described in new or revised management plans (Section 6.2), are listed below in Sections 6.1.1 (Aboriginal cultural heritage) and 6.1.2 (non-Aboriginal heritage).

6.1.1 Aboriginal Cultural Heritage

Future works at sites B, C and LC2 will be undertaken in accordance with Permit No. 1468 issued for the approved CGM in accordance with Section 87 of the *National Parks and Wildlife Act, 1974*. These future works are described below.

Sites B and C

- 21 days written notice will be provided to the Director-General of the New South Wales (NSW) Department of Environment and Climate Change (DECC) of the intention to undertake archaeological works (referred to in the permit), together with evidence of Barrick Australia Limited's (Barrick's) consultation with the Aboriginal community¹ about the proposed archaeological works and any compensatory measures proposed to be undertaken by Barrick.

¹ The Aboriginal community comprises the members described in the permit.

- Inspection, salvage and collection works will be undertaken at each site by the permit holder or delegate in accordance with the procedure contained in Special Condition 6 of the permit.

Site LC2

- A representative sample of Aboriginal objects from LC2 is proposed. The position will be recorded by GPS. The representative sample of Aboriginal objects from LC2 will be temporarily stored in the Keeping Place.
- Collected Aboriginal objects will be replaced in a location as close as possible to their original location at a time when the works within the specific area do not pose a future threat to them. Replacement will be supervised by the permit holder and/or his instructed delegates. The Aboriginal community will be notified of the programme and a representative/s will be invited to observe and, where appropriate, participate in replacement works.
- A Cultural Heritage Officer retained by Barrick will undertake routine monitoring following replacement, as a threat abatement measure.

Further, a representative sample of collected Aboriginal objects from sites B, C and LC2 may be dated by radiocarbon and/or luminescence techniques in an effort to determine their age, at the discretion of the permit holder.

6.1.2 Non-Aboriginal Heritage

Mitigation measures for non-Aboriginal heritage items located at the Cowal West Homestead Complex (CWHC) that will be implemented prior to demolition in consultation with the Lake Cowal Foundation (LCF), Bland Shire Council (BSC) and Bland District Historical Society (BDHS) include:

- retrieval and salvage of items of historic uniqueness from the Shearing [Wool] Shed and Hayshed);
- compilation of a photographic record of the Homestead; and
- storage of the salvaged items at the Lake Cowal Conservation Centre (LCCC).

Additionally, an interpretative display will be established at the LCCC in consultation with the LCF, BSC and BDHS. The display will include maps, photographs, narrative and fragments/elements salvaged from the CWHC to illustrate its history.

6.2 ENVIRONMENTAL MANAGEMENT

Barrick will prepare and implement the following new plans for the modified CGM:

- Energy Savings Action Plan (ESAP); and
- Offset Management Plan.

Barrick will also revise the following approved CGM environmental management plans and monitoring programmes to include aspects of relevance to the modified CGM. Barrick will implement the revisions and continue to implement components of the plans and programmes which remain unchanged.

- Cyanide Management Plan (CMP);
- Blast Management Plan (BMP);
- Noise Management Plan (NMP);
- Surface Water, Groundwater, Meteorological and Biological Monitoring Programme – Mine Operations (SWGMBMP);
- Site Water Management Plan (SWMP);
- Implementation of the Threatened Species Management Protocol (TSMP); and
- Monitoring Programme for Detection of any Movement of Lake Protection Bund, Water Storage and Tailings Structures and Pit/Void Walls (LPBMP).

The following approved CGM environmental management plans, studies and analyses will continue to be implemented for the modified CGM:

- Dust Management Plan (DMP);
- Land Management Plan (LMP);
- Bushfire Management Plan (BMP);
- Hazardous Waste and Chemical Management Plan (HWCMP);
- Traffic Noise Management Plan (TNMP);
- Transport of Hazardous Materials Study (THMS);
- Final Hazard Analysis (FHA);
- Emergency Response Plan (ERP);

- Flora and Fauna Management Plan (FFMP);
- Fire Safety Study (FSS); and
- Hazard and Operability Study (HAZOP).

Environmental management plans, monitoring programmes and protocols to be prepared or revised are described in further detail below.

Energy Savings Action Plan

An ESAP will be prepared that will describe energy efficiency measures to be employed to minimise greenhouse gas emissions from the modified CGM. The process for developing the ESAP will involve the following:

- determining current energy use;
- undertaking an energy management review;
- undertaking a detailed technical review; and
- assessing and identifying energy savings measures.

The ESAP will detail procedures/measures to manage/minimise greenhouse gas emissions associated with the modified CGM including:

- regular maintenance of plant and equipment to minimise fuel consumption; and
- consideration of energy efficiency in plant and equipment selection/purchase.

Offset Management Plan

Barrick propose two offset areas for the E42 Modification which are located on land owned by Barrick. The offset strategy will involve enhancement of existing areas of native vegetation (some 340 hectares [ha]) and revegetation of significant areas of cleared agricultural land (some 120 ha) (Section 4).

The conservation of the offset areas will be secured through rezoning and/or re-conditioning relevant landholdings to reflect conservation purposes. The rezoning and/or re-conditioning will be undertaken in consultation with the BSC. The rezoning and/or re-conditioning of relevant landholdings will be undertaken within three years of the Development Consent being modified or a time period to the satisfaction of the Director-General of the NSW Department of Planning (DoP).

An Offset Management Plan will be prepared to facilitate the management of the relevant lands. The plan will detail measures including:

- revegetation planting;
- regeneration of existing native vegetation communities;
- exclusion of grazing to facilitate the regeneration of native vegetation;
- weed and pest management;
- soil erosion remediation;
- selective use of native plant fertilizer;
- a proposal (within the remnant) for ecological thinning of locked thicket regrowth to encourage plant succession and to create increased habitat heterogeneity;
- fire management measures to include irregular mosaic burnings to maintain and/or increase habitat heterogeneity;
- increasing nesting resources (nest boxes and logs available from vegetation clearance activities at the mine site);
- habitat enhancement at the existing dam in the southern offset area;
- provision for consultation with the DECC regarding the management of common invasive native birds (e.g. Noisy Miners and Kurrawongs);
- re-introduction of species captured at the mine site (e.g. during vegetation clearance activities) within the southern offset area (e.g. frogs and smaller reptiles);
- signage of the vegetation offset areas; and
- monitoring the performance of the offset by suitably qualified person(s).

Cyanide Management Plan

Cyanide mitigation and management measures are described in the CMP. Specifically, the CMP includes:

- measures to contain cyanide contaminated waters entirely within the mine site;
- measures to maintain CN_{WAD} (weak acid dissociable cyanide) levels at the discharge point to the tailings storage facilities and in the decant water of the tailings storage facilities to the levels stated in the Development Consent;
- contingency measures for cyanide reduction; and
- a cyanide monitoring programme.

The CMP will be revised to include a description of the modified CGM cyanide destruction alternative (i.e. INCO process). The mitigation and management measures described in the CMP (including the cyanide monitoring programme) will continue for the modified CGM.

Blast Management Plan

Blast mitigation and management measures are described in the BMP. The mitigation and management measures (including monitoring) described in the BMP will continue for the modified CGM. The BMP will be revised to include a description of the modified CGM blast design parameters.

Noise Management Plan

Noise mitigation and management measures are described in the NMP. The NMP describes:

- relevant noise standards;
- potential noise sources and impacts;
- noise management and mitigation measures;
- a noise monitoring programme;
- provisions for the establishment of proactive and responsive noise management protocols; and
- provisions for the establishment of community consultation protocols.

The NMP will be revised to include additional noise monitoring locations (i.e. “Westlea” dwelling) and mitigation procedures, as described below.

Noise Management Zone

At private dwellings where noise emissions are predicted to be 1 to 5 A-weighted decibels (dBA) above Project-specific criteria (i.e. the “Noise Management Zone”), noise management procedures will include:

- Noise monitoring on-site and within the community.
- Prompt response to any community issues of concern.
- Refinement of on-site noise mitigation measures and operating procedures where practicable.

- Implementation of reasonable and feasible acoustical mitigation at private dwellings (which may include measures such as enhanced glazing, insulation and/or air-conditioning) where noise monitoring shows noise levels from the mine which are 3 to 5 dBA above Project-specific noise criteria.

Noise Affection Zone

At private dwellings where noise emissions are predicted to be greater than 5 dBA above Project-specific criteria (i.e. the "Noise Affection Zone"), noise management procedures will include:

- Discussions with relevant land owners to assess concerns and define responses.
- Implementation of reasonable and feasible acoustical mitigation at private dwellings (which may include measures such as enhanced glazing, insulation and/or air-conditioning) where noise monitoring shows noise levels from the mine which are >5 dBA above Project-specific noise criteria.
- Negotiated agreements with land owners where required.

Surface Water, Groundwater, Meteorological and Biological Monitoring Programme – Mine Operations

Programmes for surface water, groundwater, meteorological and biological monitoring are described in the SWGMBMP.

The surface and groundwater monitoring components will continue for the modified CGM.

The meteorological monitoring programme described in the SWGMBMP will continue for the modified CGM.

The biological monitoring programme will continue for the modified CGM. The programme will be revised, however, following completion of an independent review of the SWGMBMP in accordance with recommendations made by the Lake Cowal Independent Monitoring Panel (IMP)². The revised monitoring programme will be prepared within 3 months of the Development Consent being modified or a time period to the satisfaction of the Director-General of the DoP.

² The Independent Monitoring Panel was established in accordance with existing Development Consent Condition 8.8 (b).

Site Water Management Plan

Surface water and groundwater management and mitigation measures are described in the SWMP. The SWMP describes:

- details of the site water management system;
- measures to prevent the quality of water in Lake Cowal or any surface waters being degraded below the relevant Australian and New Zealand Environmental and Conservation Council water quality classification;
- potential adverse effects on water supply sources of surrounding landholders and landholders near the Bland Creek Palaeochannel borefield, and implementation of mitigation measures as necessary;
- changes in flood regime on productive agricultural land in Nerang Cowal as a result of the mine perimeter bund intruding into Lake Cowal, and appropriate compensation measures for affected landholders;
- development of water storages D1 and D4 to operate as first flush systems with initial captured run-off waters from the outer batters of the northern and southern waste emplacements reporting to water storage D6;
- integration of the Lake Cowal Land and Water Management Plan and Jemalong Land and Water Management Plan; and
- a programme for reporting the effectiveness of the water management systems and performance against objectives contained in the approved SWMP and Environmental Impact Statement.

The SWMP will be revised to include changes to water management required for the modified CGM, including:

- Water extraction from saline groundwater supply bores (and associated management and monitoring).
- New/modified contained water storages.
- A description of erosion and sediment control systems (including monitoring and maintenance) and salinity and soil management measures.
- Mitigation measures and management for the saline groundwater supply borefield including:
 - installation of a containment drain for the saline groundwater supply borefield pipeline; and

- leak detection mechanisms including automatic shutdown capability.

The surface water monitoring programme is described in the SWGMBMP. The surface water monitoring programme will continue for the modified CGM.

Implementation of the Threatened Species Management Protocol

The TSMP describes how the threatened species management protocol is to be implemented. The key components of the TSMP include: database interrogation, preliminary assessment, secondary assessment, threatened species management strategy and regulatory review. The TSMP includes threatened species management strategies prepared for threatened species which have been recorded in the course of targeted surveys or for which habitat resources typically associated with the lifecycle components of a threatened species have been identified. The TSMP will continue for the modified CGM.

Monitoring Programme for Detection of any Movement of Lake Protection Bund, Water Storage and Tailings Structures and Pit/Void Walls

The LPBMP describes:

- relevant guidelines for monitoring and management procedures to be undertaken in the event of detection of any movement of the lake protection bund, tailings structures and pit/void walls;
- the typical seismicity of Lake Cowal and West Wyalong;
- the methodologies behind the design of the lake protection bund, tailings storage facilities and pit/void walls; and
- a monitoring programme comprising visual assessment and survey.

The LPBMP will be revised to include a description of the modified CGM open pit, new water storages and tailings storage facilities design and monitoring (i.e. survey assessment) requirements.

6.3 REPORTING

6.3.1 Mining Operations Plan

The Mining Operations Plan (MOP) will provide information in regard to mining, processing and rehabilitation operations, relevant lease and development conditions, licences and other approvals. The MOP will also describe:

- area(s) to be disturbed;
- mining and rehabilitation method(s) to be used and their sequence;
- existing surface infrastructure;
- progressive rehabilitation schedules;
- areas of particular environmental sensitivity;
- land and water management systems; and
- resource recovery.

The MOP will be revised prior to the commencement of works for the modified CGM in accordance with the Mining, Rehabilitation and Environmental Management Process (MREMP) (Department of Primary Industries – Mineral Resources [DPI-MR], 2006) and in consultation with various regulatory and advisory agencies. The revised MOP will include management and mitigation measures relevant to visual character and rehabilitation, consolidated from previous environmental management plans.

Specific mitigation and management measures for the modified CGM that will be included in the revised MOP are presented below.

Progressive Rehabilitation

Progressive rehabilitation of waste emplacements and tailings storage facilities will be undertaken to reduce the contrast between the modified CGM landforms and the surrounding landscape. This will include progressive rehabilitation with selected grass, shrub and/or tree species in accordance with the modified CGM Rehabilitation and Landscape Management Strategy (Section 5).

Foreground Visual Screening/Vegetation Screens

Maintenance of plants will continue to be undertaken along earth mounds and vegetation screen areas surrounding Mining Lease (ML) 1535 (including along Lake Cowal Road).

Night-Lighting

Measures that will be employed to mitigate potential impacts from night-lighting will include one or more of the following, where practicable:

- Scheduling of mining operations, where practicable, so that evening and night-time operations on the waste emplacements will be located on the southern waste emplacement (i.e. the lower waste emplacement) to reduce the potential for direct lighting impacts to locations north of ML 1535.
- Restriction of night-lighting to the minimum required for operations and safety requirements, where appropriate.
- Use of unidirectional lighting techniques, where practicable.
- Use of light shields to limit the spill of lighting, where practicable.
- Provision of curtains, cladding and/or screens at nearby dwellings to help screen any potential night-time lighting impacts, in consultation with the landholder.
- Planting of trees at nearby dwellings to help screen any potential night-time lighting impacts, in consultation with the landholder.

The MOP will be revised periodically as well as prior to any significant alteration to mining and rehabilitation operations including cessation of mining.

6.3.2 Annual Environmental Management Report

Annual Environmental Management Reports (AEMRs) are currently prepared for the approved CGM in accordance with the MREMP (DPI-MR, 2006), and in consultation with various regulatory and advisory agencies to address the status of approvals, leases, licences and environmental risk management and control strategies.

For the previous 12 month period, the AEMR will also provide a summary of community relations and liaison, mine development and rehabilitation in relation to the MOP. The performance of the modified CGM in relation to the collective conditions of approvals, leases and licences for the previous 12 month period will also be reported.

The AEMR will also include a review and any proposed improvements in relation to environmental monitoring and management systems and environmental performance and will specify environmental and rehabilitation targets to be achieved during the ensuing 12 month period.

6.3.3 Independent Monitoring Panel

The IMP will continue to function for the modified CGM in its current capacity. The IMP will continue to provide an overview for the Independent Environmental Audits as well as Annual State of the Environment Reports for Lake Cowal.

6.3.4 Independent Environmental Audit

Independent environmental audits and reporting will continue for the modified CGM, as defined in existing Development Consent Condition 8.8 (a).

6.4 MONITORING

An overview of the environmental monitoring programmes for the modified CGM is provided in Table SOC-1 and Figures SOC-1 to SOC-3 which show the locations of Barrick monitoring sites. Monitoring results, as well as monitoring site locations, parameters and frequencies will continue to be reviewed via the AEMR, in consultation with the relevant authorities.

In addition to the monitoring sites listed in Table SOC-1, Barrick will also refer to other results from monitoring sites for which data is publicly available. These sites will include the NSW Department of Water and Energy (DWE) regional groundwater bores (water level and/or water quality) and the DWE stream gauges (Lachlan River flows).

Table SOC-1
Overview of the Environmental Monitoring Programme

Monitoring Focus	Section of the EA	Monitoring Sites
Meteorology - Temperature (2 m and 10 m). - Barometric pressure. - Relative humidity. - Net solar radiation. - Rainfall. - Wind speed. - Wind direction. - Sigma theta (the rate of change of wind direction).	4.1.2	CGM meteorological station.
Visual - General inspections. - Tree and shrub survival rates of landscape plantings. - Erosion inspections following periods of significant, high intensity rainfall.	4.3.3	Rehabilitated and landscaped areas.
Groundwater Water level.	4.4.3	P561A&B. Private Registered Bores: 29094, 57974, 29574, 29575, 31122, 33243 and 31341. Piezometers: 36551 - 36553, 36523, 36524, 36528, 36594 - 36597, 36609 - 36611, 36613 and 36700.
Groundwater quality and water level.		PDB1, PDB3 and PDB5. MB1, MB2, MB3, MB4, MB5, MB6, MB7, MB8 and MB9. MON01A&B, MON02A&B, PP03 and PP04. P412B&A-R, P414A&B, P417A&B, P418A&B, P558A-R and P555B&A-R. BLPR1, BLPR2, BLPR3, BLPR4, BLPR5, BLPR6 and BLPR7. TSFNA, TSFNB and TSFNC.
Surface Water Surface water quality.	4.5.3	Up-catchment diversions north and south, D1, D2, D3, D4, D5, D6, D8A, D8B, D9, pit sumps and sediment control structures.
Lake Cowal water level.		Lake Cowal gauge board.
Lake Cowal quality.		C1, P1, L1, B1 and E1. Lake Cowal transect sampling sites (including the Lachlan floodway, irrigation channel, Bland Creek, east shore, CGM and control transects).
Lake Cowal inflows quality.		Lake inflow sites (including the Lachlan floodway, irrigation channel, Bland Creek and Sandy Creek inflow sites).
Other waters (quality).		Temporary pond (lake isolation system) (quality). Treated effluent holding tank (quality).
Flora Flora monitoring.	4.6.3	Compensatory wetland. New Lake Foreshore revegetation trial areas. <i>Pilularia novae-hollandiae</i> (Austral Pillwort) habitat. Remnant Vegetation Enhancement Program areas.

Table SOC-1 (Continued)
Overview of the Environmental Monitoring Programme

Monitoring Focus	Section of the EA	Monitoring Sites
Vegetation Offset - Effectiveness of stock exclusion. - Effectiveness of introduced species control measures. - Progress of natural regeneration. - Establishment of vegetation plantings. - Requirement for maintenance/ contingency measures.	4.6.3	Northern and southern offset areas.
Fauna - Long-term baseline monitoring of bird breeding. - Fauna usage of the tailings storage facilities. - Fauna usage of the final void. - Noise and bird behaviour. - Blasting and bird behaviour in bird breeding areas. - Fauna incident inspections. - Fauna usage of rehabilitated areas. - Fauna usage of the Compensatory Wetland and remaining wetland areas within ML 1535.	4.7.3	Within ML 1535 and surrounds.
Weeds and Pests - Presence of species. - Effectiveness of control measures.	4.6.3 and 4.7.3	Within ML 1535 and surrounds.
Noise - Unattended noise monitoring. - Noise and bird behaviour (sites NO3 and NO4).	4.8.3	NO1 New Lake Foreshore. NO2 'Coniston' dwelling. NO3 Bird Breeding Area (South). NO4 Bird Breeding Area (North). NO5 'Gumbelah' dwelling. NO6 'Lake Cowal' dwelling. NO7 'Westlea' dwelling. NO8 'McLintock' dwelling.
Blasting - Peak vibration and overpressure. - Blasting and bird behaviour in bird breeding areas (BM04, BM05 and BM06).	4.8.3	BM01 'Gumbelah' dwelling. BM02 'Hillgrove' dwelling. BM03 'Coniston' dwelling. BM04 Bird Breeding Area (North). BM05 Bird Breeding Area (South). BM06 General Monitoring Site (proximal to bird breeding area).
Air Quality - Dust deposition. - Total suspended particulates.	4.9.3	DG1, DG2, DG3, DG4, DG5, DG6, DG7, DG8, DG9, DG10, DG11, DG12, DG13, McLintock's Shed, Site Office, Site 52, Lakeside and I5. HV1.

Table SOC-1 (Continued)
Overview of the Environmental Monitoring Programme

Monitoring Focus	Section of the EA	Monitoring Sites
Aboriginal Cultural Heritage Inspection by aboriginal monitors and archaeologist (if required) to identify any sub-surface Aboriginal objects prior to construction/stripping earthworks.	4.11.3	- Areas proposed for earthworks (i.e. vegetation clearance and top soil removal from within the disturbance footprint areas) and soil stripping. - Routine monitoring at Site LC2.
Movement of Lake Protection Bund, Water Storages, Tailings Storage Facilities and Pit/Void Walls Visual and survey assessments.	2.3.2	Lake protection bund, water storages, tailings storage facilities and pit/void walls.
Cyanide CN_{WAD} levels of the aqueous component of the tailings slurry stream and in the decant water.	4.7.3 and 4.15.1	- Discharge points to the northern and southern tailings storage facilities. - Decant water of the northern and southern tailings storage facilities. - On-site and off-site laboratory analysis for CN_{WAD} levels.
Free Cyanide (CN_{FREE}) at locations where employees are operating.		On-line monitoring of hydrogen cyanide gas component of CN _{FREE} at the cyanide sparging and storage area and in the process plant as follows: - cyanide sparging and storage area; - above leach tanks; - cyanide destruct tanks; - leach tail safety screen; - top and bottom of elution column; and - electrowinning section.
Movement of CN_{WAD} beneath and adjacent to the tailings storage facilities.		Network of up-gradient, down-gradient and tailings storage facility monitoring bores i.e. P558A-R, P555A-R, P555B, MON01A&B, MON02A&B, P412A-R, P412B, P414A&B, P417A&B, PP03, PP04, TSFNA, TSFNB and TSFNC.
Waste Leachate water quality and quantity.	4.4.3	Groundwater quality monitoring sites, as described above.
Rehabilitation Parameters developed in consultation with DPI-MR.	5	Rehabilitated landforms and trial areas.

