



May 2012

INTERNATIONAL CYANIDE MANAGEMENT CODE RECERTIFICATION AUDIT

Barrick Gold of Australia Ltd - Cowal Gold Mine Recertification Audit Summary Audit Report

Submitted to:

International Cyanide Management Institute (ICMI) 888 16th Street, NW Suite 303 Washington, DC 2000 UNITED STATES OF AMERICA	Barrick Gold of Australia Limited Level 10, 2 Mill Street Locked Bag 12, Cloisters Square PERTH WA 6850
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REPORT



Report Number. 117643093-003-R-Rev2

Distribution:

- 1 Copy - International Cyanide Management Institute (Electronic)
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SUMMARY AUDIT REPORT FOR OPERATIONAL GOLD MINES

Name of Mine: Cowal Gold Mine
Name of Mine Owner: Barrick Gold of Australia
Name of Mine Operator: Barrick Gold of Australia
Name of Responsible Manager: Peter Geleta, General Manager
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LOCATION DETAIL AND DESCRIPTION OF OPERATION:

Globally, Barrick Gold Corporation has 27 operating mines, located in North America, South America, Australia-Pacific and Africa.


Barrick Gold Corporation's Australia-Pacific Business Unit is managed by Barrick Gold of Australia Limited, which is headquartered in Perth, Western Australia and comprises 8 operating mines: the Kalgoorlie Consolidated Gold Mine JV, Kanowna, Granny Smith, Plutonic, Darlot and Lawlers gold mines in Western Australia; the Cowal gold mine in New South Wales; and the Porgera gold mine in Papua New Guinea.

The Barrick Cowal Gold Mine (CGM) is located on the western shore of Lake Cowal, approximately 38 km north-east of West Wyalong in mid-western New South Wales. The mine commenced operations in 2005 and, under current plans, is expected to continue until 2015.

The main components of the Cowal Gold Mine are:

- An open pit which, on completion of mining, would measure approximately 1000 m by 850 m and 325 m deep.
- A processing plant to extract the gold from the mined ore.
- Waste rock emplacements which would contain mined rock that has no commercial quantities of gold.
- Two tailings storages which would contain the slurry residue from the processing plant.
- A lake isolation system to separate the Project from Lake Cowal over the long term.
- A 132 kV electricity transmission line from Temora to the Project (some 90 km in length).

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- An access road (approximately 16 km) to the Project.

The Cowal process plant treats sulphide ore and consists of primary crushing, crushed ore stockpiling, grinding, pebble recycle crushing, gravity concentration, intensive cyanide leaching (batch process), flotation, ultra fine grinding and leaching, elution, electrowinning and smelting. The leach tailings are treated with Sodium Metabisulphate (SMBS) to destroy the cyanide to prescribed limits and then pumped to one of two tailings storage cells.

The processing plant was designed to ensure Cyanide levels in the TSF would be a maximum of 30 mg/L and, for 90% of the time, would be below 20 mg/L measured as Weak Acid Dissociable (WAD) Cyanide.

Cyanide is delivered to site dry in 22 tonne iso-tainers of dry sodium cyanide pellets. The cyanide is transferred into the plant by sparging the tankers into the process plant holding tanks.

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**SUMMARY AUDIT REPORT
AUDITORS FINDINGS**

The Cowal Gold Mine is:

in full compliance with

in substantial compliance with

not in compliance with

**The International
Cyanide Management
Code**

No significant cyanide incidents or cyanide exposures and releases were noted as occurring during the audit period.

Audit Company: Golder Associates
Audit Team Leader: Tom Carmichael, RABQSA (14544)
Email: tomcarmichael@golder.com.au

Name and Signatures of Other Auditors:

Name	Position	Signature	Date
Tom Carmichael	Lead Auditor and Technical Specialist		2 May 2012
Russell Beazley	Auditor		2 May 2012

Dates of Audit:

The Recertification Audit site visit was conducted over three days (nine person-days) between 13 December 2011 and 15 December 2011.

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code's *Gold Mining Operations Verification Protocol* and using standard and accepted practices for health, safety and environmental audits.

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PRINCIPLE 1 – PRODUCTION

Encourage Responsible Cyanide Manufacturing by Purchasing from Manufacturers that Operate in a Safe and Environmentally Protective Manner

Standard of Practice 1.1: Purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 1.1

not in compliance with


Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 1.1, requiring the operation purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide and to prevent releases of cyanide to the environment.

The operation purchases its sodium cyanide from Orica under a Supply Agreement for the Supply of Sodium Cyanide dated January 1, 2009, which requires that supplied cyanide be manufactured at a facility certified under the Code.

Orica, the supplier of cyanide to the operation, sources cyanide from its Yarwun facility, which was recertified under the Code on 12 November 2009.

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PRINCIPLE 2 – TRANSPORTATION

Protect Communities and the Environment During Cyanide Transport

Standard of Practice 2.1: Establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 2.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 2.1, requiring that the operation establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters.

The operation purchases its cyanide from Orica under a written Supply Agreement that designates responsibility for the aspects of cyanide transportation required by the Code. The Supply Agreement establishes clear lines of responsibility for safety, security, release prevention, training and emergency response through reference to the Code and to the ICMI Cyanide Transportation Audit Protocol.

The Supply Agreement requires that the transporter comply with the Code.

Orica was certified as a transporter under the Code on 14 September 2010.

Standard of Practice 2.2: Require that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 2.2

not in compliance with


Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 2.2, requiring that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management.

The operation sources all its sodium cyanide requirements from Orica. The Supply Agreement requires Orica, as a transporter, to provide Cowal with copies of audit reports, in accordance with Code requirements, demonstrating responsible cyanide management for the transport activities along the entire supply chain. Furthermore, the Supply Agreement states that no amendment to the supply chain is to be made without prior notification to the Principal (Cowal) and revised documentation being provided.

Orica's Australian cyanide transport operations were certified as being compliant with the ICMC on 14 September 2010.

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The transport of cyanide from Orica's Yarwun production facility to Cowal is coordinated from the Yarwun production facility and uses a combination of road and rail:

- Road
 - Toll Resources (Queensland)
 - Patrick Logistics (New South Wales)
- Rail
 - QR National (Queensland)
 - Pacific National (New South Wales)
 - Patrick Logistics (New South Wales).


Product for Cowal in New South Wales is loaded at Yarwun and transported by road, 2 km to the Mt Miller Rail Yard by Toll Resources (Gladstone). From Mt Miller, QR National transports the product by rail over one day to the Acacia Ridge Rail Yard where it is transferred to Pacific National. From Acacia Ridge, Pacific National transports the product 930 km south over one day, to Pacific National's Chullora Rail Yard. From Chullora, Patrick Logistics transports the product by road, to Maritime Container Services at Enfield, in Sydney over one day. Patrick Logistics then rails the product from Enfield to Dubbo. At Dubbo the product is delivered by road over one day to Cowal by Patrick Logistics.

The use of the Maritime Container Services at Enfield was implemented in June 2010, following the completion and approval (by the NSW Department of Planning) of a study of the implications of the change in the route, prepared in accordance with the draft guideline, Route Selection – Guidelines for Land Use and Environmental Safety Planning for Hazardous Materials – Road Transport Considerations.

The audit reports conclude Orica's cyanide transportation activities between Yarwun and Cowal demonstrate the implementation of programs, practices and procedures consistent with ICMI's Cyanide Transportation Audit Protocol and were in Full Compliance with the Code.

The operation provided delivery documents confirming delivery of cyanide by Orica.

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PRINCIPLE 3 – HANDLING AND STORAGE

Design and Construct Unloading, Storage and Mixing Facilities Consistent with Sound, Accepted Engineering Practices, Quality Control/Quality Assurance Procedures, Spill Prevention and Spill Containment Measures

Standard of Practice 3.1: Design and construct unloading, storage and mixing facilities consistent with sound, accepted engineering practices, quality control/quality assurance procedures, spill prevention and spill containment measures.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 3.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:


Cowal is in FULL COMPLIANCE with Standard of Practice 3.1, requiring that cyanide handling and storage facilities are designed and constructed consistent with sound, accepted engineering practices, QA/QC procedures, spill prevention and spill containment measures.

The cyanide handling and storage facilities have been built to the standards of the mine’s cyanide manufacturer and supplier, Orica and to meet the requirements of the state government. The nearest surface water body is Lake Cowal 1 km to the south-east; separation is achieved by a specially constructed bund wall. The nearest habitation to the mine is pastoral station 2.5 km to the north. Reagent cyanide is unloaded using Orica’s “sparge” system, carried out on a competent concrete surface. Any spills would drain to the reagent bund from where they can be recovered for use in the leach circuit.

A system of level instruments, controls, alarms and trips are in place to manage the risk of tank overfilling. The cyanide mixing and day tanks are installed on concrete plinths. The leach tanks are installed on footings that been built of concrete and bitumen to prevent seepage to the subsurface and the footing design incorporates a tell-tale system to accelerate the identification of leaks from the tank bottoms. The tanks and their associated pumps are installed in a secondary containment system built of concrete floors and walls that provide effective containment.

The cyanide tanks effectively isolate the stored reagent from the elements and are effectively vented so that breathing emissions should not lead to hazardous concentrations of HCN where workers are present. The unloading and storage areas are in a secure location and have facilities to enable additional security to be invoked if considered necessary. The nearest incompatible material is hydrochloric acid which is hydraulically isolated from the cyanide area approximately 50 m away.

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Standard of Practice 3.2: Operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 3.2

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:


Cowal is in FULL COMPLIANCE with Standard of Practice 3.2 requiring that cyanide handling and storage facilities are operated using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

The bulk solids containers used to deliver cyanide using Orica’s “sparge” system remain under Orica’s control at all times, including delivery to site and its immediate return for re-use after unloading. Because containers remain truck-mounted and are returned immediately, there is no opportunity to stack the containers at site. Driver safety is the main measure required to prevent rupturing or puncturing of the containers. The unloading procedure incorporates features required by the Code including:

- Requirements for the personal protective equipment to be used during unloading.
- Escorting of vehicles on site to ensure safe driving helps prevent rupturing or puncturing of containers.
- Observation of the unloading operation by a combination of local observer during high risk steps and the use of video at other times.
- An automated rinse cycle that is designed to practically minimise the residual cyanide present in the container on its return journey to Orica.
- Requirements to rinse the container externally and to fit wire seals to the outlet valves for the return journey.
- A note that containers are not to be stacked under any circumstances.
- A requirement for any spillage to be cleaned up immediately.

Standard operating procedures and operator training are effective in managing unloading practices. As noted in Standard of Practice 4.1, plant inspections and preventive maintenance routines are carried out to scopes and frequencies that appear are appropriate to the current condition of the facilities.

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PRINCIPLE 4 – OPERATIONS

Manage Cyanide Process Solutions and Waste Streams to Protect Human Health and the Environment

Standard of Practice 4.1: Implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.1


not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 4.1, requiring that the operation implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.

The operation has written management plans and procedures that cover its cyanide facilities including unloading and storage, leaching, tailings management and cyanide destruction. As required by the New South Wales Government when the project was approved, the management plans document the control requirements for key parameters such as tailings storage facility freeboard and discharged cyanide concentrations. The management plans are supported by detailed procedures which cover the inspections required to deliver on the management plan requirements; responsibilities for these inspections are distributed amongst processing, maintenance and specialised engineers and scientists. The inspections address tanks, bunds, machines, instruments and the tailings storage facilities. The mine has progressively improved its system for managing change to ensure that cyanide risks remain under effective control as the operation evolves. The government approval for the project required the conduct of a comprehensive initial HAZOP study and the mine continues to apply the HAZOP discipline to the assessment and management of risk as improvements to mine operations are considered and adopted. The procedures include prepared responses to foreseeable contingencies such as leaks and spills of reagent, slurries and tailings, high levels in tailings storage and water ponds, and aberrations in processing conditions that may increase the risk of cyanide exposures. Many processing conditions are monitored continually from the process control room. Others are monitored by inspections that are scheduled on frequencies ranging from say twice per shift through daily, weekly, fortnightly, monthly and quarterly to annually. It appears that the frequency of inspections is managing the risk of cyanide releases and exposures effectively at present. The inspections cover many relevant details with respect to integrity, corrosion, leaks and availability. Records are prepared as required by the Code and are being retained in both hard copy and electronic form (using the Oracle system). A strategic approach to the scope and frequency of inspections and preventive maintenance was clearly presented to the Auditors. The operation has determined that electric power is not critical to the prevention of releases and exposures; however the site does have an uninterruptible power supply and emergency generator to limit the disruption and consequential risk associated with power failures.

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Standard of Practice 4.2: Introduce management and operating systems to minimise cyanide use, thereby limiting concentrations of cyanide in mill tailings.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.2

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 4.2, requiring that the operation limit the use of cyanide to that optimal for economic recovery of gold so that the waste tailings material has as low a cyanide concentration as practicable.

Cowal conducts a programme to determine appropriate cyanide addition rates in the mill and evaluates and adjusts addition rates as necessary when ore types or processing practices change cyanide requirements.

Samples have been taken and independently revised, recommendations have been made and Cowal is reviewing the recommendations.

Cowal has evaluated a number of control strategies including automatic free cyanide analysers and manual sampling methods. A Cyantific Instrument Free Cyanide Analyser measures free cyanide levels in Tanks 2 and 9 every five to ten minutes. Manual titrate sampling is also conducted three-hourly with a procedure to test more frequently if 10 ppm is recorded.

A daily releach test is also conducted to determine if increased cyanide addition rates would result in increased recovery. If no additional benefit is evident, it then allows for the cyanide addition rates to be lowered.

The dosage rate is reviewed by the site metallurgist in conjunction with testwork and may be altered to maintain a suitable level of free cyanide in the leach circuit. This control strategy has been loaded into the Distributed Control Systems (DCS) and automatically adjusts the cyanide addition flow rate, depending on mill throughput. Total cyanide reagent consumption is reviewed on a daily basis to ensure any deviations from normal operation can be identified and corrected.

Standard of Practice 4.3: Implement a comprehensive water management program to protect against unintentional releases.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.3

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 4.3, requiring that the operation implement a comprehensive water management programme to protect against unintentional releases.

Cowal has developed a comprehensive, probabilistic water balance as part of the Project's Environmental Impact Statement (EIS). The probabilistic water balance has been continually revised since the first version was compiled in May 2005. The model simulates a period of ten years. The water balance model has been designed to best simulate site-specific weather conditions including storm and rainfall events that may put the project at risk of over topping ponds and impoundments.

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The Senior Metallurgist completes a quarterly desktop and output review of the model and completes a revised output to determine if and when the freeboard limits will be breached – usually during worst case scenario. This process is covered by the procedure Cyanide Code Water Balance Model.

The water balance considers the amount of tailings deposited. Rate of deposition can be altered depending on simulated mill throughput rates as well as pulp discharge density. The Water Balance Manual outlines the design storm events, runoff coefficients, catchment area and design capacity for each TSF and surface water catchment dams. Each of these parameters can be simulated in the Water Balance Model at any particular time over any chosen time period.

The model uses local precipitation and evaporation records for model design parameters. The Bureau of Meteorology's West Wyalong database provides ongoing information. Design runoff coefficients for all water containments are outlined in the Site Water Management Plan, and can be simulated in the Water Balance Model. If required, runoff coefficients could be changed to 100% to overestimate the impact of a design event. Freezing and thawing is not applicable to the climate at Cowal.

The model does take into account solution losses from evaporation. Seepage is not included because it is collected from the TSFs underdrainage and pumped back to the decant. There are no surface water discharges from Cowal.

Power outages can still be simulated within the water balance model for any scenario. The water balance model will indicate whether any ponds or impoundments would be likely to overtop.


The active TSF is inspected three times a day during which observations are made on the supernatant pond water level, wall integrity and other mechanical or operational observations. In addition to this, all TSFs undergo a weekly inspection, which is more thorough.

The Process Water Pond (D6) is monitored for solution volume by an automatic level sensor, which is noted on the control room log sheet every three hours as manual prompt.

Ponds and impoundments are designed and operated with adequate freeboard above the maximum design storage capacity determined to be necessary from water balance calculations and by regulatory requirements. For each TSF, Cowal has implemented a 500 mm freeboard for slurry and a 1000 mm freeboard for supernatant water, which meets the 1 in 1000 year event of 216 mm. All site ponds and impoundments are operated with a solution freeboard of no less than 1 m of freeboard.

The operation does measure on-site precipitation, and compares results to design assumptions and revises operating practices as necessary. Actual rainfall measurements are taken on-site are forwarded to a consulting firm for review during the calibration runs of the water balance model to ensure that the model best reflects actual rainfall events.

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Standard of Practice 4.4: Implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.4

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 4.4, requiring that the operation implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions.


The operation has implemented measures to restrict access by wildlife and livestock to all open waters where WAD cyanide exceeds 50 mg/L WAD cyanide. WAD cyanide results taken for the Southern TSF (the current TSF) at the discharge point and the supernatant were viewed and all results meet the licence requirements. Even though there are no ponds that exceed 50 mg/L WAD cyanide, Cowal has installed fencing around the TSFs and at D6. A gate allows access for personnel to the TSF, which is closed at the end of the shift. The fence is electric and has been constructed with 50 mm diameter mesh to a height of 2 m. From 0.5 m below ground level to 0.5 m above ground level, the mesh has a diameter of 20 mm. Cowal has also installed bird scaring systems.

Cowal can demonstrate that the cyanide concentration in open waters does not exceed 50 mg/L WAD cyanide. The operation has implemented measures to restrict access by wildlife and livestock in the TSFs and D6, which contain WAD cyanide. WAD cyanide results taken for the Southern TSF at the discharge point and the supernatant were viewed and all results meet the development consent's requirements.

Maintaining a WAD cyanide concentration of 50 mg/L or less in open water has been shown to be effective in preventing significant wildlife mortality. Cowal has a wildlife monitoring programme in the form of twice daily TSF inspections that include inspection and recording of wildlife status and activity. A review of the wildlife monitoring records indicated that inspections were occurring as per the procedure.

The operation does not use a heap leach process.

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Standard of Practice 4.5: Implement measures to protect fish and wildlife from direct or indirect discharges of cyanide process solutions to surface water.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.5

not in compliance with

not applicable


Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 4.5, requiring that the operation implement measures to protect fish and wildlife from direct or indirect discharges of cyanide process solutions to surface water.

The Environmental Coordinator advised that there is no discharge to surface water from the site. The site visit and review of the site plan and aerial photograph also confirmed that there is no discharge to surface water. Cowal has also constructed a Lake Protection Wall to the requirements of the Development Consent. Cowal does not have an indirect discharge to surface water.

Groundwater modelling studies have been conducted and the TSF has been designed to minimise seepage as much as possible. Monitoring around the TSF has indicated that the cyanide results have been below the laboratory limits of reporting. Groundwater sampling is documented in the Annual Environmental Return. Underdrainage trenches within the TSFs collect seepage water, which is pumped back to into the TSF.

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Standard of Practice 4.6: Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.6

not in compliance with

not applicable

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 4.6, requiring the operation implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.

A beneficial use of groundwater has been defined by a regulatory body for Cowal by authorising the site to dewater the pit for use in the process plant. Cowal must provide monitoring results of designated groundwater bores to the DECCW through the submittal of the monitoring results from groundwater bores in the Annual Environmental Return. These results do not stipulate WAD cyanide concentrations.


The saline nature of the groundwater precludes its use for stock, domestic or irrigation purposes.

A number of seepage control measures have been incorporated into the TSFs, including clay linings and underdrainage systems, to prevent the seepage of cyanide laden water.

Monitoring results show WAD cyanide levels in groundwater downgradient of the TSFs and process plant are below detection limits. As such, it can be surmised that there is no seepage from the operation entering the groundwater.

The operation does not use mill tailings as underground backfill.

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Standard of Practice 4.7: Provide spill prevention or containment measures for process tanks and pipelines.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.7


not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 4.7 requiring that the operation implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.

The cyanide unloading area incorporates spill containment facilities. A combination of spill prevention and containment is provided in association with cyanide mixing, storage and processing tanks. All such tanks are installed on impermeable footings within secondary containments with integrity management systems applied to both the tanks and the secondary containments. The secondary containments are all sized to meet the Code requirements. There is additional protection through the installation of a Process Stormwater Pond that will capture stormwater from areas not otherwise controlled by the tank bunds or the pit that collects runoff from the general processing areas. Water, slurry and other fluids collecting in the bunds is pumped into the process using fixed sump pumps in most cases. If material collects in either the general processing pit or the Process Stormwater Pond it can be pumped back into the processing operation by the temporary installation of mobile pumping equipment. All tanks handling cyanide solutions are backed up by secondary containment. All cyanide pipelines are inspected for integrity on a monthly basis whilst operational inspections are more frequent, especially the tailings lines which are inspected for leaks three times per day. A Lake Protection Wall has been built to ensure that Lake Cowal is protected from mine operations, including those involving cyanide. A risk assessment has been prepared to demonstrate that this is an effective measure. Process plant is generally fabricated from materials known to be compatible with cyanide and high pH conditions such as concrete, carbon steel, stainless steels and high density polythene. A polyurea coating has recently been introduced to line processing tanks, following checks made to verify the suitability of the proprietary product involved.

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Standard of Practice 4.8: Implement quality control/quality assurance procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.8


not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 4.8 requiring that operations implement QA/QC procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

For the Certification Audit a report was prepared based on a review of the original construction quality program and the then-current operations to provide assurance that operations could continue safely from a cyanide perspective. Since then, there have been a number of plant modifications and there has been evidence of wear and tear on processing equipment. Evidence was examined to verify that quality assurance and quality control programs are continuing to be applied to new construction and modification works, addressing the suitability of materials, their fabrication and installation. Examples examined during the audit covered a tailings storage expansion, the replacement of a pressure vessel in a higher grade of steel and the installation of corrosion-resistant linings in process tanks. From the documents kept, it was possible to verify that in each case the quality management work had been signed off by an appropriately qualified person, with different requirements applicable in each case. The operation had recently commissioned a new integrity review to confirm that appropriate steps were being taken to manage the integrity of the cyanide facilities. The audit found that appropriate action had been taken on the findings and recommendations of that review.

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COWAL GOLD MINE ICMC SUMMARY RECERTIFICATION AUDIT REPORT

Standard of Practice 4.9: Implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and groundwater quality.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.9

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 4.9 requiring that operations implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and groundwater quality.

Cowal has developed written standard procedures for monitoring activities. Cowal has implemented a range of management plans in accordance with its Development Consent. In addition to the management plans, Cowal has developed Standard Operating Procedures (SOPs) that are used to monitor and evaluate the effects of cyanide on wildlife, surface and groundwater quality.

Sampling and analytical procedures have been developed by appropriately qualified personnel.

The SOPs were developed, maintained and reviewed by current employees within the Cowal Environmental Department. The most recent modifications were made by the Environmental Coordinator and approved by the Environmental Manager. In addition to this, the sampling and analytical protocols detailed comply with relevant management plans and Australian/New Zealand Standards.

The operation's procedures specify how and where samples should be taken, sample preservation techniques, chain of custody procedures, shipping instructions, and cyanide species to be analysed. Cyanide species to be analysed are detailed in the relevant procedure and in the management plans.

Sampling conditions (e.g. weather, livestock/wildlife activity, anthropogenic influences, etc), and procedures are documented in writing at Cowal.


The completed field sheets used for groundwater sampling and TSF monitoring had sections which recorded information on sampling conditions, related to climatic conditions, time, equipment used, other influence (i.e. fauna).

Cowal currently monitors WAD cyanide in groundwater downgradient and upgradient of the TSFs and from bores surrounding the TSFs. The operation does not have a direct or indirect discharge to surface water.

Sample frequencies, as approved by the regulator, are as follows:

- Twice daily slurry and decant water samples
- Quarterly groundwater samples
- Twice daily wildlife monitoring.

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PRINCIPLE 5 – DECOMMISSIONING

Manage Cyanide Process Solutions and Waste Streams to Protect Human Health and the Environment

Standard of Practice 5.1: Plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 5.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 5.1, requiring that a decommissioning plan is developed and implemented for effective closure of cyanide facilities to protect human health, wildlife and livestock.


Cowal has developed a Decontamination and Decommissioning Plan (DDP). The DDP is relevant to the site and specifically details decommissioning activities such as:

- Decontamination of equipment
- Disposal of reagents
- Area specific plans.

An implementation schedule of the activities described in the DPP is presented as Figure 2 in Section 6 of the DDP. The schedule is divided into monthly units, 24 months prior to closure and continue for up to 24 months after closure.

The DDP is an appendix to Cowal's Mine Closure Plan (MCP), which details the review requirements. The DDP is reviewed as part of the MCP review. The MCP was last reviewed in November 2011 and no changes were made to the DDP (therefore the most recent version of the DDP being 2007). This review process shows that Cowal's decommissioning procedures have been reviewed with a sufficient frequency to reflect changes at Cowal.

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Standard of Practice 5.2: Establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 5.2

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:


Cowal is in FULL COMPLIANCE with Standard of Practice 5.2, requiring that operation establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.

Cowal has developed an estimate of the cost to fund cyanide related to decommissioning. In September 2005 a cost estimate for closure of the Processing Plant and associated infrastructure was prepared. These costs were recalculated in 2007 through the Barrick Reclamation Cost Estimator (BRCE) model, and again in 2008 in accordance with Barrick’s *Mine Closure Planning and Cost Estimation Guideline*, which outlines the approach to mine site reclamation, remediation and decommissioning. This Guideline states that closure costs will be based on third party rates and is consistent with the Financial Accounting Standards Board Statement No. 143, “Accounting for Obligations Associated with the Retirement of Long-lived Assets” (FAS 143). The estimate was then recalculated again to reflect inflation in December 2011. Costs are updated to reflect any operational changes, but none regarding decommissioning have occurred.

Barrick’s *Mine Closure Planning and Cost Estimation Guideline* states that mine closure costs should be reviewed and updated annually or when a “triggering event”, such as significant changes to the mine plan, closure regulation, etc occurs. The cyanide related decommissioning costs are included within the mine closure costs. The decommissioning costs were last reviewed in December 2011, and have been reviewed in 2009 and 2010.

Cowal has established a financial mechanism approved by applicable jurisdiction to cover the estimated costs for rehabilitation and decommissioning. Barrick renewed its bond on 30 April 2010 with the NSW Department of Industry and Investment to increase the amount held against Lease 1535, which reflects the cost of closure.

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PRINCIPLE 6 – WORKER SAFETY

Protect Workers’ Health and Safety from Exposure to Cyanide

Standard of Practice 6.1: Identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 6.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:


Cowal is in FULL COMPLIANCE with Standard of Practice 6.1 requiring an operation to identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.

The operation has developed procedures describing how cyanide-related tasks such unloading, mixing, plant operations, entry into confined spaces, and equipment decontamination prior to maintenance should be conducted to minimise worker exposure. The procedures identify the hazards associated with each task and the steps required to complete it safely, such as pre-work inspections and the use of PPE. These procedures are provided to relevant personnel, who are required to be assessed competent against each procedure before they can undertake them unsupervised.

The operation has procedures to review proposed process and operational changes and modifications for their potential impacts on worker health and safety, and incorporate the necessary worker protection measures. The Management of Change procedure is utilised for administrative, physical, operational or organisational changes that affect operating and/or maintenance activities, plant or equipment. The procedure requires that the appropriate Safety, Health and Environmental functional area representatives are consulted prior to the implementation of a change. Examples of changes provided to the Auditor followed the Management of Change procedure, with all changes assessed by environmental and health and safety personnel.

The operation does solicit and actively considers worker input in developing and evaluating health and safety procedures. Procedures are reviewed based on the criticality of the procedure. During the review process, employees and supervisors are given an opportunity to suggest changes. Employees are also able to comment on procedure validity during safety meetings, training/refresher training and the STOP programme.

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Standard of Practice 6.2: Operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 6.2

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 6.2 requiring the operation operate and monitor cyanide facilities to protect worker health and safety and periodically evaluates the effectiveness of health and safety measures.

Cowal has determined that a pH of 11.0 and 11.2 is appropriate for limiting the evolution of HCN gas during mixing and production activities, respectively. The pH is monitored by an online pH probe as well as manual checks (up to four times per shift) conducted by the Leach Operator. Online pH readings are displayed on the DCS and is alarmed should the pH drop below the set point. At the time of audit, the pH was above 11.0.


Where the potential exists for significant cyanide exposure, the operation uses both fixed and personal monitoring devices to confirm that controls are adequate to limit worker exposure to HCN gas.

Ten fixed hydrogen cyanide analysers are in place in areas, which were determined to be at the highest risk of exceeding 10 ppm on an instantaneous basis. The locations were identified during a formal HAZOP study conducted during the design of the Cowal Gold Project. The fixed monitors are located at:

- Cyanide destruction
- Leach tank 1-3
- Leach tank 4-6
- Tailings hopper
- Float cell 1
- Carbon screen
- Elution column top
- Elution column base
- Gold room
- Cyanide unloading and mixing area.

Personal monitors are also worn on site by people working in areas determine to be at higher risk of HCN evolution (e.g. Leach Circuit). Areas where personal HCN monitors are required are sign posted accordingly. Personnel are required to notify their supervisor when a HCN reading of 4.7 ppm or above is detected, and are not allowed to remain in that area for more than 8 hours continuously. Should a HCN reading of 10 ppm or greater be detected, then personnel are to immediately leave the area and notify their supervisor.

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All fixed monitors are calibrated monthly by Cowal electricians, as per work orders generated as part of the site's preventative maintenance schedule. All portable monitors are calibrated every three months using a calibration docking station. If overdue for calibration, the alarm functionality will still work, even though the instantaneous reading is not displayed. At least one year's worth of calibration records were sighted by the Auditor for both the fixed and portable HCN monitors.

Warning signs have been placed in areas identified as being at high risk of being exposed to cyanide. The signs state that cyanide is present, and that smoking, open flame and eating and drinking are not permitted. Signage is present indicating the specific PPE that must be worn when entering the area. The specific PPE requirements when working with cyanide are also covered and explained during the Process Plant Induction package, which incorporates a Cyanide Induction. The training package also stipulates no smoking, eating and drinking areas.


Showers, low-pressure eyewash stations and dry-powder fire extinguishers are strategically located throughout the operation in the cyanide areas, and are maintained, inspected and tested on a regular basis. Showers and low-pressure eyewash stations within the Process Plant are maintained and tested on a fortnightly basis. Servicing and inspection of dry powder fire extinguishers is undertaken by a subcontractor and a quarterly preventative maintenance routine has been established to initiate a purchase order for the subcontractor. A review of the fire extinguishers noted the inspections were current.

Unloading, storage, process tanks and piping containing cyanide are identified to alert workers of their contents, and the direction of cyanide flow in pipes designated. Cyanide storage and mixing tanks are labelled with Emergency Information Panels, indicating that liquid cyanide is stored within. Signage has been erected at all entry points into cyanide areas, alerting the person/s to treat all tanks and pipe work as being cyanide bearing until proven otherwise. All reagent strength pipes are painted lilac, labelled as containing cyanide and have the direction of flow indicated. Piping labels are also used on-site for other reagent lines, and water lines such as process water, raw water, reverse osmosis water and potable water. These labels include a direction arrow to indicate the direction of flow contained within the pipe.

Material Safety Data Sheets (MSDS), first aid procedures and informational materials on cyanide safety were available in the language of the workforce (English) in areas where cyanide is managed. These are posted in the control room, emergency response centre, reagent yard and processing office. MSDSs can also be accessed electronically by any employee with a Barrick computer login.

There is a system used for reporting and investigating incidents and an Incident Investigation Procedure. Once an incident has been observed, the incident report form is completed by the individual and their supervisor. This is then sent to the Process Safety Training Coordinator for review. The information is entered into the RIMS database where corrective actions are developed and tracked to ensure that the relevant personnel close them out.

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Standard of Practice 6.3: Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 6.3

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 6.3 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

Cowal has the necessary response and communication equipment readily available for use at cyanide unloading, storage and mixing locations, which includes:

- Closed circuit television in the mill
- Water
- Antidote kits
- Resuscitation and defibrillation equipment
- Trauma kits
- Ambulance

Evidence was observed to show that Cowal does inspect its first aid equipment regularly to ensure that it is available when needed, and materials are stored and/or tested as directed by their manufacturer.

The operation has developed and implemented a site specific Cyanide Emergency Procedure (CEP) to respond to cyanide incidents, including the treatment of exposures.


The operation does have its own on-site capability to provide First Aid or medical assistance to workers exposed to cyanide. Cowal is manned by a dedicated Emergency Response Officer (ERO) 24 hours a day seven days a week. There is also a fulltime ERC working five days a week that is on call 24 hours a day seven days a week. The EROs and the ERC have emergency medical training. In addition, many on-site personnel have senior or advanced first aid training. A first aid room is manned 24 hours a day and is contains resuscitation and defibrillation equipment, as well as a cyanide antidote.

The operation has established set routes to transport patients to hospital and advised these to the West Wyalong Hospital and NSW Ambulance Service. In the event of a cyanide exposure incident, an ambulance is called to the site and depending on the circumstances, the operation may despatch its ambulance to transfer the patient at some point along the designated route.

The operation has made formalised arrangements with the West Wyalong Hospital to ensure it is aware of the potential need to treat patients for cyanide exposure. The operation issued a letter to the West Wyalong Acting Health Services Manager requesting that they acknowledge the receipt of two cyanide antidote kits and acknowledge the possibility that it may be required to treat persons affected by cyanide at their facility.

The operation has actively worked with the West Wyalong Hospital to inform them about cyanide risks and provide the hospital with the necessary training and equipment to treat cyanide exposure cases.

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Cowal has regularly conducted mock emergency drills to test response procedures for various cyanide exposure scenarios, and lessons learned from the drills are incorporated into response planning.

The operation has conducted numerous mock cyanide drills involving Emergency Response Team (ERT) response to cyanide exposures and spills. The ERC and EROs run frequent in-house training for ERT members in various aspects of emergency response. This includes specific cyanide scenario training, generic hazardous materials training and first aid.

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PRINCIPLE 7 – EMERGENCY RESPONSE

Protect Communities and the Environment through the Development of Emergency Response Strategies and Capabilities

Standard of Practice 7.1: Prepare detailed emergency response plans for potential cyanide releases.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 7.1 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

Cowal has adopted a tiered approach to emergency response and management on site:

- Crisis Management and Recovery Plan (CMRP)
- Emergency Response Plan (ERP)
- Cyanide Emergency Procedure (CEP).

The CEP details the required response equipment, responsibilities, and procedures for anticipated cyanide emergencies at Cowal. The intention of this document is to provide a single point of reference for all cyanide incidents on-site where emergency response is required.

The CEP and ERP consider the potential cyanide failure scenarios appropriate for the operation's site-specific environmental and operating circumstances. The CEP was designed around the Cyanide Code and consequently details specific response actions.


Solid cyanide briquettes are delivered to the site in sparge containers via road transport. Vehicle entry to the site is controlled and vehicles are escorted to the unloading area. Cowal has developed an ERP for transportation accidents within the site boundary.

In all cases involving a spill of cyanide, Orica is notified as a priority and no action is taken after containment of the spill without consultation with Orica. Specific transport route or vehicle design information relevant to the emergency would be provided by the consignor (Orica).

The ERP and CEP describe specific response actions (as appropriate for the anticipated emergency situations) such as clearing site personnel from the area of exposure, use of cyanide antidotes and First Aid measures. Section 5.1 of the CEP details the process by which site personnel are evacuated to appropriate site Muster Points and subsequent removal of site personnel from the Cowal Gold Mine lease if required. The Cowal Gold Mine has also developed an Emergency Evacuation Plan which details the actions necessary for a site evacuation.

The CEP addresses the notification of potentially affected communities by means of activating the Crisis Management and Recovery (CMR) Team upon escalation of a potential incident. Section 5.19 of the CEP details the First Aid procedure to be followed in the event of a cyanide exposure incident.

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**COWAL GOLD MINE ICMC SUMMARY RECERTIFICATION
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Standard of Practice 7.2: Involve site personnel and stakeholders in the planning process.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.2

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 7.2 requiring an operation involve site personnel and stakeholders in the planning process.

The operation has involved its workforce and stakeholders, including potentially affected communities, in the cyanide emergency response planning process. The ERP and CEP was initially developed with input from the site’s Senior Metallurgist, Safety Coordinator, ERC and selected supervisors. Section 12.5 of the ERP (including the CEP) requires an annual review of the document, plus following emergencies or drills.

ERT members and invited external emergency services are provided with an opportunity to comment on the ERP and CEP during mock drill debriefs as part of a continual improvement process. The workforce is also consulted regarding cyanide use and emergency response procedures through regular Services Environmental, Safety and Health meetings.

Local emergency services are also consulted on aspects of the ERP and CEP during Local Emergency Management Committee (LEMC) meetings that Cowal personnel attend.

Cowal has a mutual aid agreement with the Bland Rural Fire Service and have close ties with the nearby North Parkes Mine. Regular drills and training sessions are held with these entities and other emergency services agencies. During debrief sessions, suggestions on improving emergency procedures can be made.

The ERP and CEP are updated annually. Consultation and communication with stakeholders regarding updates are as per the mechanisms in 7.2.1.

Standard of Practice 7.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.3

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:


Cowal is in FULL COMPLIANCE with Standard of Practice 7.3 requiring an operation designate appropriate personnel and commit necessary equipment and resources for emergency response.

The cyanide-related elements of the emergency response plan:

- Designate primary and alternate emergency response coordinators who have explicit authority to commit the resources necessary to implement the plan:

Section 3 of the ERP ‘Definition of Terms’ details the responsibilities of each role title. It states that the Emergency Services Coordinator will take the role of Emergency Controller. There are a number of people who are trained in the role of Emergency Controller. Should the primary Emergency Controller not be available for the emergency situation, e.g. he/she is incapacitated by the emergency; the most senior staff member who is adequately trained will assume the role of Emergency Controller.

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- Identify emergency response teams:

Cowal operates four ERT teams, with one team on duty per shift. ERT team members and their contact details are listed in Appendix C Emergency Response Team Contact and Currency Sheet within the CEP.

- Require appropriate training for emergency responders:

Section 12.4 of the ERP details the Training and Evaluation requirements. The training matrix for each of the ERTs (Mon-Fri and A Panel, B Panel, C Panel and D Panel) was sighted.

- Include call-out procedures and 24-hour contact information for the coordinators and response team members:

Appendix 5 of the ERP details the emergency response contact telephone and fax numbers. Internal and External contacts are also included in Section 9 of the CEP, this includes all the contacts of each of the ERT members and the currency of their training.

- Specify the duties and responsibilities of the coordinators and team members:

The roles and responsibilities of the various emergency responders are defined in Section 4 of the CEP.

- List emergency response equipment, including personal protection gear, available along transportation routes and/or on site:

The required emergency response equipment is detailed in Section 5.7 PPE and Equipment for Cyanide Emergencies of the CEP. Section 7.14 of the ERP details the Type and Location of Emergency Equipment kept at site.

- Include procedures to inspect emergency response equipment to ensure its availability:


Cowal inspects their emergency response equipment as per 6.3.2. Cyanide response Breathing Apparatus and Chemical Suits are serviced as per equipment requirements.

- Describe the role of outside responders, medical facilities and communities in the emergency response procedures:

Section 11 Interaction with Emergency Services and Section 12.1 Public Relations and Debriefing of the ERP detail communication requirements outside of Cowal.

Cowal has confirmed that outside entities included in the ERP are aware of their involvement and are included as necessary in mock drills or implementation exercises. The Cowal Emergency Response Coordinator is invited to attend the LEMC meetings which are held on a quarterly basis. The Emergency Response Coordinator uses the LEMC forum to table the Cowal ERP and CEP for stakeholder comment.

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Standard of Practice 7.4: Develop procedures for internal and external emergency notification and reporting.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.4

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 7.4 requiring the development of procedures for internal and external emergency notification and reporting.

The ERP and CEP include procedures and contact information for notifying management, regulatory agencies, outside response providers and medical facilities of the cyanide emergency.

Any formal notification to external agencies will be requested from the site Emergency Controller only with direct consultation with the CMRP Team Leader or OHS and Training.

Section 8.2 Notification of Authorities and Neighbours, Section 11 Interaction with Emergency Services and Section 12.1 Public Relations and Debriefing of the ERP detail communication requirements outside of Cowal. Appendix 5 lists the contact details.

Section 9 Attachment 3 of the CEP also lists the contact details of External Emergency Contacts divided up into those who have a role in the plan and those that do not. The contact details of local landowners are also detailed.

Standard of Practice 7.5: Incorporate in response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.5

not in compliance with


Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 7.5 requiring an operation develop procedures for internal and external emergency notification and reporting.

The CEP and related documents do describe specific remediation measures as appropriate for the likely cyanide release scenarios, such as:

- Recovery or neutralisation of solutions and solids.
- Decontamination of soils and other contaminated media.
- Management and/or disposal of spill clean-up debris.
- Provision of an alternate drinking water supply.

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Considerations are made within the CEP for ground remediation and neutralisation with ferrous sulphate for all relevant scenarios. As stated in the plan it is essential that the Environmental Manager or his/her delegate attends all cyanide related incidents for direct consultation in monitoring, clean up and disposal of all contaminated media. The CEP states for each neutralisation scenario that:

“Under no circumstances shall Ferrous Sulphate & Sodium Hypochlorite be utilised for decontamination or remediation purposes when there is the risk of contaminating water sources.”

In section 10.18 of the Responding to Spills Containing Cyanide Procedure it is stated that that spills be reported to the Environmental Department so that the required samples are taken and monitoring of the area can be carried out to confirm there is no further contamination issues with the spill site.

Standard of Practice 7.6: Periodically evaluate response procedures and capabilities and revise them as needed.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.6

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 7.6 requiring an operation periodically evaluate response procedures and capabilities and revise them as needed.


The operation does review and evaluate the cyanide related elements of its ERP for adequacy on a regular basis. Section 12.5 of the ERP (including the CEP) requires an annual review of the document, plus following emergencies or drills. The CEP has been reviewed five times since 2009, whilst the ERP has been reviewed six times since 2007.

Mock emergency drills are conducted periodically as part of the ERP evaluation process. The operation has conducted numerous mock cyanide drills involving ERT response to cyanide exposures and spills. Two full scale site evacuation drills have been conducted in the last two years.

The ERC and EROs also run weekly training for ERT members in various aspects of emergency response. This includes specific cyanide scenario training, generic hazardous materials training and first aid.

Provisions are in place to evaluate and revise the ERP and associated procedures after any cyanide related emergency requiring its implementation. The ERP states that it is reviewed annually and after each real emergency. To ensure the review occurs the document is included in Cowal’s audit system. No cyanide emergency has occurred to date.

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PRINCIPLE 8 – TRAINING

Train Workers and Emergency Response Personnel to Manage Cyanide in a Safe and Environmentally Protective Manner

Standard of Practice 8.1: Train workers to understand the hazards associated with cyanide use.

in full compliance with

The operation is in substantial compliance with **Standard of Practice 8.1**

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 8.1 requiring an operation train workers to understand the hazards associated with cyanide use.

The operation does train all personnel who may encounter cyanide in cyanide hazard recognition

All personnel who are entering the processing area must undergo a Processing Induction (or be escorted by an inducted person) regardless of their work type. This includes an information session on the hazardous chemicals that are likely to be encountered on-site, including cyanide. In addition to this, all employees who are Processing inducted undergo an Orica cyanide awareness presentation as a minimum requirement. That package addresses information on exposure routes, symptoms of poisoning, first aid and safe handling. Refresher training is conducted every 12 months.

All of these presentations include a competency-based assessment to be completed, signed and documented. All persons who are entering site but do not work in the processing area are subject to a Barrick Site Induction, this too includes information on hazardous chemicals held on-site including cyanide to make people aware.

Cyanide hazard recognition and refresher training is conducted periodically.

Cyanide training records are retained. Training files are maintained for each employee, including hard copies of the assessments undertaken in each area of competency and the evaluation made of each assessment by the Trainer/Assessor.

Training records are also kept electronically in the RIMS training system, providing an overview of the training elements completed by each employee and when each element falls due for refresher.

Standard of Practice 8.2: Train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.

in full compliance with

The operation is in substantial compliance with **Standard of Practice 8.2**

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 8.2 requiring that an operation trains appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.

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The operation trains workers to perform their normal production tasks, including unloading, mixing, production and maintenance, with minimum risk to worker health and safety and in a manner that prevents unplanned cyanide releases.

The site has also developed a training package MinProc which contains reference material, training material and assessment material which is used to test the competence of an operator in a particular area or on a particular task. Operations personnel complete the MinProc intranet training and complete written assessment associated with each training element.

On the job training is delivered through a one on one session with either their Shift Supervisors or the Process Safety Training Coordinator. The basis of this training is following the standard operating procedure with the trainee, demonstrating the steps and explaining the hazards. Once the trainee understands the procedure they will complete a sign-off form and then begin completing the tasks under the supervision of the trainer. The forms carrying the signatures of the trainees and the assessor are stored in the personal training record file specific to each employee.

Training can also be delivered in a group environment during the scheduled training days (six per year). These training days cover refresher training and selected special topics.

All training records including MinProc, JHA/FLRA and Isolations are documented on-site in the RIMS training system and hard copies are kept in personal files in the Training Filing System.

The training elements necessary for each job involving cyanide management are identified in training materials.

Within the RIMS System, the training requirements for each job are identified in terms of training modules that must be completed before the employee is deemed fully competent in their role. A range of core modules are common to many jobs and other modules are specialised.

Standard operating procedures have been developed and are used as the basis to identify training requirements with respect to hazards and risks involved with completing the specific task. These procedures cover cyanide-related tasks such as the leach operator's collection, preparation and analysis of samples from the cyanide destruct process and cyanide unloading.

Appropriately qualified personnel provide task training related to cyanide management activities.

The Processing Training Coordinator and five Shift Supervisors hold Certificate IV Trainer/Assessor qualifications and have significant experience in the processing plant. The Shift Supervisors are also actively involved in training and assessment, carrying out that role based on their significant experience in the mineral processing plant.


The ERC holds qualifications in Diploma of Management, Cert IV OHS, and Diploma in Paramedical Science and Certificate IV in Training and Assessment.

Employees are trained prior to working with cyanide.

Prior to working with cyanide, all employees must undergo:

- Site induction
- Area inductions (e.g. Processing)
- Cyanide Supplier's Cyanide Safety Guidelines and Assessment
- Cyanide Worker Package and Assessment

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All require a competency assessment to be completed which is recorded electronically in the RIMS training system as well as hard copies in the site filing system.

Process employees must also sit the MinProc training programme, which gives an overview of the plant processes and requires them to pass an assessment.

Refresher training on cyanide management is provided to ensure that employees continue to perform their jobs in a safe and environmentally protective manner. Review and sign-off of procedures by employees and their supervisors in the processing area is undertaken annually. Such refreshers generally occur during six dedicated training days that have been allotted throughout each calendar year.

Records of the refresher training and assessments are filed in individual training files and recorded in the RIMS training system.

The operation evaluates the effectiveness of cyanide training by testing, observation or other means. The Barrick site induction, processing induction, Orica cyanide awareness and cyanide worker package training is tested using written assessments. The answers to these assessments and any discrepancies are discussed with the trainee prior to being deemed competent. The MinProc training package also contains a competency based assessment.

Another method for evaluating the effectiveness of cyanide training is through the Supervisor's Task Observation Programme (STOP). STOP focuses on recognising and reinforcing good safety behaviour and gaining commitment to change at-risk behaviour.

Records are retained throughout an individual's employment documenting the training they receive. The records do include the names of the employee and the trainer, the date of training, the topics covered, and if the employee demonstrated an understanding of the training materials.

Records for all training conducted on-site are captured and recorded in the RIMS training system and with hard copies kept in the site filing system.

Standard of Practice 8.3: Train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 8.3

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 8.3 requiring an operation train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

Non-ERT members are not required to respond to cyanide incidents other than through raising of the alarm. The process for raising the alarm is covered in site wide and processing induction material, as well as being posted in the mill control room.

The ERC and EROs run frequent in-house training for ERT members in various aspects of emergency response. This includes specific cyanide scenario training, generic hazardous materials training and first aid. In addition, the ERC runs annual HAZMAT Rookie courses and conducts training for ERT competitions, which include various aspects of responding to cyanide incidents.

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Cyanide emergency response personnel are trained in decontamination and first aid. They also take part in routine drill to test and improve their response skills. Process personnel do not provide a response to cyanide exposures or spills outside of bunded areas. In such an event, the ERT is called out to respond.

EROs and ERT members do receive training in the procedures contained within the CEP. All members receive certified training in decontamination and first aid to a certificate level. In addition, ERT members undergo frequent in-house training in appropriate elements of the CEP, including equipment use, spill clean-up and decontamination and first aid.

The operation has made off-site Emergency Responders, such as community members, local responders and medical providers, familiar with those elements of the Emergency Response Plan related to cyanide. The Cowal ERC is invited to attend the LEMC meetings which are held on a quarterly basis. The ERC uses the LEMC forum to table the Cowal Gold Mine ERP and CEP for stakeholder comment. Minutes of the meeting show that the plans were reviewed and accepted by state emergency services as a guide to follow if attending a site related cyanide incident.


All members receive certified training in decontamination and first aid to a certificate level. In addition, ERT members undergo frequent in-house training in appropriate elements of the CEP, including equipment use, spill clean-up and decontamination and first aid.

Mock emergency drills are conducted periodically as part of the ERP evaluation process. They cover both worker exposure and environmental releases. The operation has conducted numerous mock cyanide drills involving ERT response to cyanide exposures and spills. The ERC and EROs also run weekly training for ERT members in various aspects of emergency response. This includes specific cyanide scenario training, generic hazardous materials training and first aid.

Cyanide emergency drills are evaluated from a training perspective to determine if personnel have the knowledge and skills required for effective response. Training procedures are revised if deficiencies are identified. Following each mock drill or actual incident, the ERT document an Emergency Response Debrief. These briefs highlight any issues associated with the ERT response to an incident or drill, and what corrective actions are required to close out the issues.

ERT training attendance sheets, documenting the training, name of trainer and trainee, the date, topics covered and the how an understanding was demonstrated. The Cyanide Emergency Response training undertaken by the ERT members is refreshed annually.

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PRINCIPLE 9 – DIALOGUE

Engage in Public Consultation and Disclosure

Standard of Practice 9.1: Provide stakeholders the opportunity to communicate issues of concern.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 9.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 9.1 requiring an operation to provide opportunity for stakeholders to communicate issues of concern regarding the management of cyanide.

The operation provides the opportunity for stakeholders to communicate issues of concern regarding the management of cyanide through a number of mediums. Cowal has a Community Relations Manager with responsibility for the development and implementation of a communications system, which incorporates stakeholder engagement with respect to cyanide.

The corporate Barrick site directs people to a corporate email address (publicaffairsap@barrick.com) and provides additional information links for Barrick and the International Cyanide Management Institute (www.cyanidecode.org).


The internal information document Cyanide Management External Consultation Processes details the external communication methods available to stakeholders to communicate with Barrick, those that specifically related to cyanide include:

- Complaints line.
- Barrick Cowal email address
- Family and community open days.
- Site visits by members of the public.

In addition to the above measures, Cowal has set up the Community Environment Monitoring Consultative Committee (CEMCC), which is Requirement 8.7 of the Development Consent Conditions. This meeting is held quarterly and is used to discuss and ask questions relating to the site, and can include discussions on cyanide. Each meeting includes a report on cyanide monitoring results and a presentation was given on 1 December 2010 regarding the change to SMBS cyanide destruct at Cowal.

Cowal also release a newsletter that goes to every house in the three local shires called Cowal Update and an internal newsletter, the 'Babbler', which contain the complaints phone number and email address.

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Standard of Practice 9.2: Initiate dialogue describing cyanide management procedures and responsively address identified concerns.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 9.2

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 9.2 requiring an operation to initiate dialogue describing cyanide management procedures and responsively addressing identified concerns.

The operation provides opportunities for communication with its stakeholders regarding cyanide management practices. Cowal has a Community Relations Manager with responsibility for the development and implementation of a communications system, which incorporates stakeholder engagement with respect to cyanide.

Barrick has compiled three information packages on cyanide and its management and placed it on their website (www.barrick.com > Corporate Responsibility > Current Issues > Cyanide Management).


The internal information document Cyanide Management External Consultation Processes details the external communication methods that specifically related to communication by Barrick regarding cyanide.

In addition to the above measures, Cowal has set up the CEMCC which is Requirement 8.7 of the Development Consent Conditions. This meeting is held quarterly, and is used to discuss and ask questions relating to the site, and can include discussions on cyanide. Every meeting contains cyanide monitoring results.

These meetings consist of representatives from Barrick (at least two), local community and an independent scientist. These meetings provide another way for the surrounding community to ask questions and make comment

Cowal also release a newsletter that goes to every house in the three local shires called Cowal Update and an internal newsletter, the 'Babbler', which can provide information regarding cyanide to the local community.

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Standard of Practice 9.3: Make appropriate operational and environmental information regarding cyanide available to stakeholders.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 9.3

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

Cowal is in FULL COMPLIANCE with Standard of Practice 9.3 requiring an operation make appropriate operational and environmental information regarding cyanide to stakeholders.

Barrick has compiled three information packages on cyanide and its management and placed it on their website (www.barrick.com under Corporate Responsibility > Current Issues > Cyanide Management). Specific sections relating to written descriptions of how their activities are conducted and how cyanide is managed are incorporated are found within two of those information packages.

In addition to this, at the CEMCC meetings Cowal has presented on the use of cyanide, and continually updates the community about cyanide monitoring results. A presentation on cyanide use at Cowal was given on 6 December 2011. Management of cyanide is also communicated through the Visitor Induction, Site Induction and open days.

The operation does not know of any stakeholders that are illiterate. However, the operation ensures that the verbal information is disseminated through stakeholders via staff available at open days to questioning and through presentations at the CEMCC.

The operation has the mechanisms to make information publicly available on the cyanide release or exposure incidents, where applicable.

Incidents relating to spills and other similar unintentional releases are required to be reported under both internal and external regulatory reporting requirements.

As part of its Development Conditions, Cowal is required to generate an Annual Environmental Return to be submitted to the DECCW. The non-compliances reported in the Annual Environmental Returns are publicly available at the Office of Environment and Heritage's website (<http://www.environment.nsw.gov.au/prpoeoapp/>).


Exposures resulting in hospitalisation or fatality are required to be reported to the Department of Primary Industry (DPI) as part of the NSW Mines Inspection Act. Severe incidents that would involve exposures or fatalities would be covered under the Crisis Management and Recovery Plan.

The Crisis Management and Recovery Plan defines the communication responsibility and procedures required for each level of incident. Section 13 defines the reporting levels required for an internal reporting event, Level 1: Unusual Event, Level 2: Alert, Level 3: Site Area Crisis and Level 4: General Disaster, all which can be related to cyanide spills and cover scenarios a) to d).

In addition to the regulatory reporting requirements the CEMCC are presented with a quarterly overview of the sites performance, which includes site incidents such as injuries and spills, including cyanide incidents that are required to have either internal or external reporting.

At a corporate level, the Barrick website (www.barrick.com > Corporate Responsibility > Reporting > Performance Tables) has environmental and safety statistics for each site, including Cowal, that cover the public disclosure requirements in this SOP.

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LIMITATIONS

Your attention is drawn to the document – “Limitations”, which is included in Appendix A of this report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by Golder, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

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Date



Report Signature Page

GOLDER ASSOCIATES PTY LTD

A handwritten signature in black ink, appearing to read 'T. Carmichael', written over a horizontal line.

Tom Carmichael
ICMI Lead Auditor and Technical Specialist

RJB/EWC/eh

A.B.N. 64 006 107 857

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APPENDIX A

Limitations



LIMITATIONS

This Document has been provided by Golder Associates Pty Ltd ("Golder") subject to the following limitations:

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