



KMH ENVIRONMENTAL

**INTERNATIONAL CYANIDE
MANAGEMENT CODE PRE-
OPERATIONAL AUDIT**

**COWAL GOLD PROJECT
PRE-OPERATIONAL AUDIT**

prepared for

BARRICK AUSTRALIA LIMITED

SUMMARY AUDIT REPORT

28 March 2006

*KMH Environmental Pty Ltd
PO Box 307
Belrose, NSW 2085, Australia*

Name of Mine: **Cowal Gold Project**

Name of Mine Owner: **Barrick Australia**

Name of Mine Operator: **Barrick Australia**

Name of Responsible Manager: **Richard Weston General Manager**

Address: **PO Box 210 West Wyalong**

State/ Country: **New South Wales 2671 Australia**

Telephone: **(61-2) 6975 4700**

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Location and Description of Process

The Cowal Gold Project was in the pre-operational phase at the time of this audit and is located on former agricultural land on the edge of Lake Cowal, 38km northeast of West Wyalong, central New South Wales, 350 kilometres west of Sydney. It is expected to treat 6.4Mtpa at an average gold grade of 1.4 g/t. Gold production is expected to average approximately 230,000 ounces over the first three years. Based on existing reserves of 2.5 million ounces, the minimum mine life is expected to be approximately 10 years. The project is on schedule to begin production the first quarter of 2006. All major permits are in place and construction was well progressed at the time of the audit.

The ore processing operation can be divided into three elements: the processing plant, cyanide management and the tailings storage facilities.

The process plant will initially process oxide ore until adequate supplies are depleted. The process plant will then be modified to treat Sulphide ore by adding a flotation circuit, and converting the leach circuit from oxide ore leach to primary concentrate leach.

The process plant will consist of primary crushing, crushed ore stockpiling, grinding, pebble recycle crushing, gravity concentration, intensive cyanide leaching (batch process), ultra fine grinding and leaching, elution, electrowinning and smelting. This circuit is for the treatment of oxide ores only. In addition to this, two flash flotation cells and a series of rougher and scavenger flotation cells will be installed for the treatment of sulphide ores in the future.

Cyanide Management - Cyanide (Sodium Cyanide - NaCN) will be delivered to site dry in 22 tonne isotainers of dry sodium cyanide pellets. The cyanide will be transferred into the plant by sparging the tankers into the process plant holding tanks. The solid cyanide will be delivered premixed with sufficient caustic (sodium Hydroxide) to provide protective alkalinity during mixing, therefore addition of caustic to the mixing tank is not required.

Once cyanide mixing is complete, the cyanide solution is transferred to the cyanide day tank. There are two pumps transferring cyanide from the day tank: The cyanide distribution pump is used to service the cyanide ring main which delivers cyanide to the leaching circuit. The cyanide dosing pump transfers set amounts of cyanide to the pre soak tank in the elution circuit and also to the intensive cyanide leach reactor.

Tailings Storage Facilities - following cyanide destruction, the slurry from the leaching and flotation circuits passes to the tailings thickeners, where the slurry will be thickened prior to pumping to the tailings water pond. Tailings solids will settle out in the tailings dam, while decant water is recycled back to the process plant. There will be no discharge from the tailings storage facilities.

Auditors Finding

in full compliance with

The operation is in substantial compliance with **International Cyanide Management Code**

not in compliance with

Audit Company: **KMH Environmental Pty Ltd**

Audit Team Leader: **Ken Holmes**

E-mail: **ken@kmh.com.au**

Names and Signatures of Other Auditors:

Tony Williams



28 March 2006

Name of Auditor

Signature of Auditor

Date

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 Verification Protocol for Gold Mine Operations and using standard and accepted practices for health, safety and environmental audits.

Cowal Gold Project



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Name of Facility

Signature of Lead Auditor

Date

1. PRODUCTION: *Encourage responsible cyanide manufacturing by purchasing from manufacturers who 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

Basis for Audit Finding: A contract has been drafted that requires the cyanide supplier (Orica Mining Chemicals, a business unit of Orica Limited) to meet all requirements of the Code. Note that Orica is a signatory to the International Cyanide Management Code).



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

Basis for Audit Finding: The Cyanide supply contract that has been drafted clearly allocates the responsibilities specified in this SOP.

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

Basis for Audit Finding: The Cyanide supply contract places the responsibility on the supplier to prepare and implement a full emergency response plan for all stages of cyanide transport. The contract also requires evidence of conformance with all requirements of the Code.



3. HANDLING AND STORAGE: *Protect workers and the environment during cyanide handling and storage.*

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

Basis for Audit Finding: The cyanide handling areas have been designed and construction was underway at the time of the audit. All cyanide transfer at the process plant is fully contained, i.e. no handling of cyanides will be required by plant personnel. Appropriate design documentation has been prepared.

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

Basis for Audit Finding: Documented procedures and emergency response plans have been prepared. Inspection checklists have been prepared and an appropriate preventative maintenance program documented.



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 utilising 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

Basis for Audit Finding: A range of operational procedures were being drafted at the time of the audit that covered all elements of cyanide management at the Cowal site. The regulatory requirements applicable to the operation have been fully identified and are documented in the relevant plans. A process for change management has been developed that should result in operational or procedural modifications should changes have the potential to increase the risk of cyanide releases. Contingency plans have been prepared to cover process upset conditions. Testing and inspection programs have been drafted for processing and tailings disposal areas and a preventative maintenance program has been prepared. A Cyanide Emergency Response Plan has been drafted.

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

Basis for Audit Finding: Studies have been undertaken to determine the optimal ranges of cyanide concentration within the process. Routine process monitoring and testing programs have been drafted that will provide on-going process optimisation data.



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

Basis for Audit Finding: A water balance model was prepared during the environmental impact assessment and has since been updated. The water balance model covers all issues specified in this SOP. Inspection procedures have been prepared for the tailings storage facility. Storage pond designs have been prepared (pond construction is complete) that satisfy the requirements of the water balance model. A weather station has been established to measure and record precipitation data in accordance with this SOP.

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

Basis for Audit Finding: The environmental approvals and licences associated with this mine require CN_{WAD} of 30 mg/l. In addition the operation has committed to fencing the tailings storage facilities and implementing other wildlife protection measures.



Standard of Practice 4.5: *Implement measures to protect fish and wildlife from direct and 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

Basis for Audit Finding: The project is required to capture, treat and retain all water that falls on the site. The site is designed as a zero-discharge facility. Modelling carried out for the EIS demonstrates that there will be no indirect discharge to surface waters. Spill and emergency response plans have been developed.

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

Basis for Audit Finding: Design documents indicate that the tailings storage facilities are constructed of low permeability materials. The operation has implemented a specific surface and groundwater monitoring program designed to give early warning of tailings dam leaks.

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

Basis for Audit Finding: All cyanide handling and storage areas are provided with appropriate secondary containment of sealed concrete bunds and slabs. The facility is designed to ensure that no spills can be released. Procedures have been drafted in spill response and cleanup. Cyanide tanks and pipeline design documentation confirms that appropriate materials have been specified for cyanide handling equipment.

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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

Basis for Audit Finding: The plant construction contractor has prepared and implemented a construction quality control and quality assurance plan. Quality records relating to implementation of this plan are being maintained. The quality control and assurance plan details record retention and construction validation / verification processes and personnel.

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

in full compliance with

The operation is in substantial compliance with **Standard of Practice 4.9**

not in compliance with

Basis for Audit Finding: Draft flora and fauna protection procedures, environmental monitoring and inspection plans have been prepared and the operation has committed to maintaining comprehensive records.



5. DECOMMISSIONING: *Protect communities and the environment from cyanide through development and implementation of decommissioning plans for cyanide facilities.*

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

Basis for Audit Finding: A site reclamation and rehabilitation plan has been prepared for the site. The plan provides an appropriate overview and schedule of proposed decommissioning activities for the entire project.

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

Basis for Audit Finding: A decommissioning budget has been prepared for the site by specialist consultants. In addition, a bond has been provided to the New South Wales Department of Mineral Resources to cover decommissioning and cleanup costs. The bond is sufficient to cover the predicted site rehabilitation costs.



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

Basis for Audit Finding: Potential cyanide exposure scenarios have been identified and contingency plans prepared to cover these scenarios. Personal protective equipment requirements have been identified and documented for all site operational areas. Process change procedures have been developed and documented that trigger a review of cyanide management activities. A commitment has been made to seek worker input in the preparation and review of all operational procedures.

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

Basis for Audit Finding: Optimum pH ranges have been determined for the process plant to minimise Hydrogen Cyanide (HCN) release. Personal protective equipment requirements and HCN monitoring requirements have been established for all relevant process areas. Monitoring equipment maintenance programs have been drafted. Safety showers/eye wash stations and decontamination equipment have been installed and signs warning of cyanide use areas will be installed. Chemical risk information and Material Safety Data Sheets have been collated and appropriate first aid resources including a permanent first aid centre are planned for the site. Audits and inspections of these facilities and equipment have been planned and checklists prepared.



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

Basis for Audit Finding: The operation has committed to providing full safety equipment including safety showers/eye wash stations, first aid equipment, and a permanent first aid station, first aid training, a permanent on-site ambulance to transport patients to the nearest hospital. Other measures include the provision of resources (including antidotes) to the local hospital to treat cyanide poisoning. A commitment has been made to conducting drills and testing the relevant emergency procedures twice per year.



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

Basis for Audit Finding: A Cyanide Release Procedure has been drafted which covers potential cyanide releases.

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

Basis for Audit Finding: The Emergency Response Plan that has been drafted covers impacts on neighbours. There is documented evidence that the operation has and will continue to consult local stakeholders, including Councils, Fire Services and Hospitals.

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

Basis for Audit Finding: The resources specified in this SOP have been committed to in the Emergency Response Plan and Cyanide Emergency Procedure. Correspondence with external stakeholders that was reviewed demonstrated a commitment to engage and inform all stakeholders.

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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

Basis for Audit Finding: The notification requirements specified in this SOP have been committed to in the Emergency Response Plan and Cyanide Emergency Procedure.

Standard of Practice 7.5: *Incorporate into 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

Basis for Audit Finding: Cyanide spill cleanup procedures have been drafted in accordance with the requirements of this SOP. Section 10 of those procedures prohibits the use of inappropriate decontamination chemicals.

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

Basis for Audit Finding: The emergency response plan commits to regular evaluation of the plan and procedures, and the conduct of mock trials and exercises.

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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

Basis for Audit Finding: The Barrick Australia Safety Standards commit the operation to providing appropriate training to all personnel. Training documentation is being prepared including cyanide handling procedures. Critical safety training, including cyanide training will be provided annually to relevant personnel. The “Competency Based Training and Evaluation Procedure” details the requirements for documenting and recording all training conducted.

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

Basis for Audit Finding: An operational procedure “Unloading, Mixing & Storage of Sodium Cyanide” has been prepared. Training needs for all personnel has been documented in a training matrix. Minimum competencies and skills have been identified for all relevant cyanide-handling personnel and commitment has been given to ensure that all personnel handling cyanide are provided with the appropriate training prior to commencing work. A commitment to annual refresher training is documented. Procedures for assessment of training effectiveness have been documented and details of records to be kept determined.



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

Basis for Audit Finding: Procedures for dealing with cyanide releases and worker exposure have been drafted. Commitments have been made to provide appropriate personnel training. A procedure for public consultation relating to cyanide management has been drafted, and the “Competency Based Training and Evaluation Procedure” details the requirements for documenting and recording all training conducted.



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

Basis for Audit Finding: Schedules and processes for public disclosure have been drafted. The “Public Consultation and Disclosure – Cyanide Management Procedure” describes the process by which information regarding the nature, use and management of cyanide will be disseminated to relevant stakeholders.

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

Basis for Audit Finding: The “Draft Public Consultation and Disclosure – Cyanide Management Procedure” describes the process by which information regarding the nature, use and management of cyanide will be disseminated to stakeholders. Public information sessions, conducted by the Mine Manager, have been commenced.



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

Basis for Audit Finding: The ICMC Community Presentation provides a summary of how cyanide is used and managed on-site. The presentation is delivered periodically at community forums. A schedule for presentations has been prepared. Incident reporting processes have been drafted or identified in the Cyanide Emergency Management Procedure and Cyanide Management Plan. It is explicit or implicit in the sighted incident reporting processes that all incidents, of which public notice is required under the Code, would be publicly reported.

