Evolution Mining - Cowal Gold Mine


Summary Audit Findings Report

August 2018
# Summary Audit Report

**Name of Mine**: [Name]  
**Name of Mine Owner**: [Name]  
**Name of Mine Operator**: [Name]  
**Name of Responsible Manager**: [Name]

## Location Detail and Description of Operation

**Principle 1 – Production**
- **Standard of Practice 1.1**: [Details]

**Principle 2 – Transportation**
- **Standard of Practice 2.1**: [Details]
- **Standard of Practice 2.2**: [Details]

**Principle 3 – Handling and Storage**
- **Standard of Practice 3.1**: [Details]
- **Standard of Practice 3.2**: [Details]

**Principle 4 – Operations**
- **Standard of Practice 4.1**: [Details]
- **Standard of Practice 4.2**: [Details]
- **Standard of Practice 4.3**: [Details]
- **Standard of Practice 4.4**: [Details]
- **Standard of Practice 4.5**: [Details]
- **Standard of Practice 4.6**: [Details]
- **Standard of Practice 4.7**: [Details]
- **Standard of Practice 4.8**: [Details]
- **Standard of Practice 4.9**: [Details]

**Principle 5 – Decommissioning**
- **Standard of Practice 5.1**: [Details]
- **Standard of Practice 5.2**: [Details]

**Principle 6 – Worker Safety**
- **Standard of Practice 6.1**: [Details]
- **Standard of Practice 6.2**: [Details]
- **Standard of Practice 6.3**: [Details]

**Principle 7 – Emergency Response**
- **Standard of Practice 7.1**: [Details]
- **Standard of Practice 7.2**: [Details]
- **Standard of Practice 7.3**: [Details]
- **Standard of Practice 7.4**: [Details]
- **Standard of Practice 7.5**: [Details]
SUMMARY AUDIT REPORT

Name of Mine
Cowal Gold Mine

Name of Mine Owner
Evolution Mining (Cowal) Pty Ltd

Name of Mine Operator
Evolution Mining (Cowal) Pty Ltd

Name of Responsible Manager
Jamie Coad – Acting General Manager

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LOCATION DETAIL AND DESCRIPTION OF OPERATION

Evolution Mining owns and operates five gold operations. Three of the operations are located in Queensland, Australia, one in New South Wales and one in Western Australia. Evolution Mining’s diversified portfolio combining production and growth has made it become the second largest ASX listed gold miner. In 2015, Evolution Mining acquired 100% interest in the Cowal Project from Barrick Gold Corporation.

The Cowal Gold Mine (Cowal) is located on the western shore of Lake Cowal, approximately 32 km northeast of West Wyalong in Mid-Western New South Wales. The mine commenced operations in 2005 and scheduled to continue until 2032 at current estimates with a remaining life of mine strip ratio of 0.25:1.
The main components of Cowal are:

- An open pit which, on completion of mining, would measure approximately 1.2000 km by 1.0 km and 500 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 tailing storage facilities (TSF) 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); and
- An access road (approximately 3 km) to the Project.

The Cowal process plant treats oxide and 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 Metabisulphite (SMBS) to destroy the cyanide to prescribed limits and then pumped to one of two tailings storage cells.

The process 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 isotainers of dry sodium cyanide pellets. The cyanide is transferred into the plant by sparging the tankers into the process plant holding tanks.

**AUDITOR’S FINDING**

This operation is:

- ☑ in full compliance
- ☐ in substantial compliance
- ☐ not in compliance

with the International Cyanide Management Code Gold Mine Operations Verification Protocol. This operation has not experienced compliance problems during the previous three-year audit cycle.
Audit Team Leader and Technical Specialist

John Miragliotta (john.miragliotta@sustainability.net.au)

24 May 2018

Names and Signatures of Other Auditors

Chris Coutinho (Auditor)

24 May 2018

Date(s) of Audit

Inclusive of the period from 20-23 February 2018.

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.
PRINCIPLE 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

Summarize 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.

Orica is the sole cyanide supplier to the mine operation, the product being produced at the Yarwun facility, Queensland and which was re-certified under the Code on 22 February 2017.
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 ☐ not in compliance with Standard of Practice 2.1

Summarize the basis for this Finding/Deficiencies Identified:

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

Orica is the contracted cyanide supplier and is certified under the Code. Orica's Australian Supply Chain was certified as compliant with the ICMC on 26/1/2015.

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 ☐ not in compliance with Standard of Practice 2.2

Summarize the basis for this Finding/Deficiencies Identified:

The mine is in FULL COMPLIANCE with Standard of Practice 2.2, as 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 has clear lines of responsibility for safety, security, release prevention, training and emergency response as required by the ICMI Cyanide Transportation Audit Protocol.

Orica’s Australian Supply Chain (for cyanide transport) was re-certified as compliant with the ICMC on 26/1/2015. The supply agreement requires that the transporter and its subcontractors comply with the Code.
PRINCIPLE 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

☐ in substantial compliance with

☐ not in compliance with

Summarize 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, in order to receive cyanide via sparge isotainers. The facilities were inspected by an engineering consultant following construction who concluded the unloading, mixing and storage facilities have been designed and constructed in accordance with sound engineering practices and jurisdictional rules. Engineering inspection reports in 2015 and 2017 confirmed the continued structural integrity of the cyanide storage facility.

The unloading and storage areas are located away from people and surface waters. The nearest surface water body is Lake Cowal 1.0 km to the south-east and not hydraulically connected to the unloading and storage areas. All areas permanently occupied by the workforce are not in the vicinity of the facilities. A qualitative risk assessment of the cyanide facilities in the unloading and storage areas in respect to potential for releases to surface water and/or human exposure determined that the facilities and location of the compound provide such protection with the existing controls that no further risk reduction action is currently required.

Cyanide from the sparge isotainers is unloaded on a concrete surface which minimises seepage to the subsurface. The surface has also been designed and constructed to drain any unplanned spillage or hose up solution to the secondary containment that surrounds the cyanide mixing and storage tanks.
There are methods in place to prevent the overfilling of cyanide day (storage) tank and the cyanide (sparge) mixing tank. Both tanks have both been installed with level indicators that display on the control system in the plant control room. High and High-High level alarms are configured on each tank. Monthly preventative maintenance checks are conducted on the cyanide mixing and storage tank level instruments to manage their reliability.

The cyanide storage and cyanide sparge mixing tanks are located on a concrete surface that can prevent seepage to the subsurface. As-built drawings show that the mixing and storage tanks have been installed on concrete ring beams with compacted fill placed in the annular space, topped by layers of concrete and bitumen to prevent potential leakage reaching the natural subsurface.

Secondary containments for cyanide storage and mixing tanks (i.e. bunding and flooring) are constructed of concrete, which provides a competent barrier to leakage.

Cyanide is stored with adequate ventilation to prevent the build-up of HCN gas. Cyanide is delivered in solid briquette form in isotainers, where it is mixed via the sparging process and stored in the storage tanks. These tanks are installed outdoors (in the open) and both tanks are vented to atmosphere via vent pipes that extend 7 m above ground level.

The mixing and storage tanks are enclosed vessels installed on a competent foundation that ensures they stand above any ponded water under most circumstances and the tank vent designs are such that water ingress cannot occur under normal weather conditions.

The cyanide reagent area is contained within the secured boundaries of the processing plant and has additional fencing around the secondary containment.

The cyanide unloading, mixing and storage area is located away from areas where acids, strong oxidisers and explosives are stored. No food products of any sort are kept within the reagent storage area or processing plant.

**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

☐ in substantial compliance with Standard of Practice 3.2

☐ not in compliance with

Evolution Mining - Cowal Gold Mine

9 August 2018

Lead Auditor: John Miragliotta

Signature of Lead Auditor

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Summarize the basis for this Finding/Deficiencies Identified:

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

Cyanide briquettes are delivered to site in Orica isotainers. The cyanide is sparged on-site by the delivery driver and returned to Orica on the same vehicle. These isotainers are specifically designed by Orica for transporting and sparging cyanide briquettes. As such, they are not used for any other purpose.

A procedure is in place for the operation of all valves and couplings for mixing the cyanide into liquid form and the subsequent cleaning of them subsequent to sparging identified by the full removal of the dye colour.

The design and handling of the cyanide isotainers is such as to minimise the risk of rupturing or puncturing. The isotainers are not stacked more than one high as specified by a procedure. A procedure is in place and implemented to clean any cyanide residue from the outside of cyanide containers that are returned to the vendor and securely close them for shipment.

Procedures are in place and implemented to prevent exposures and releases during cyanide unloading and mixing activities. This is addressed in the site’s Cyanide Unloading, Mixing and Storage and Responding to Spill Containing Cyanide procedures. Cyanide unloading is undertaken by personnel equipped with appropriate PPE and subject to observation by a second individual from a safe area and by video feed to the control room.
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 utilizing contingency planning and inspection and preventive maintenance procedures.

☑ in full compliance with

☐ in substantial compliance with Standard of Practice 4.1

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The mine is in FULL COMPLIANCE with Standard of Practice 4.1, having continued to implement management systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.

The operation has a range of written management and operating plans in place to manage cyanide facilities. Operating management plans and procedures were developed and continue to be used for the safe operation in all cyanide related activities, covering: unloading and storage facilities, leach circuit, cyanide destruct and tailings impoundments.

The Development Consent Conditions for the mine establish regulatory requirements to prevent or control cyanide releases and exposures. These include a requirement that there be no discharge from the site and that regulatory limits in place for WAD CN levels at the compliance monitoring point are not exceeded.

Water management procedures for key cyanide-containing storages have been developed to retain the storage capacity of these facilities. Operations and Maintenance Manuals have been prepared and implemented for the Tailings Storage Facilities (TSF). An extensive Site Water Management Plan has also been developed for the site. The Cyanide Management Plan includes prescriptions for the management of freeboard in the tailings storage facilities and the permitted concentrations of cyanide discharged to these facilities. The operation has developed the Mine Closure Plan and the Decontamination and Decommissioning Plan – Processing Facilities which describe how cyanide would be managed in the event of a temporary closure or cessation of operations.
The operation has implemented a Management of Change procedure which identifies when changes in a site's processes or operating practices may increase the potential for the release of cyanide and which requires the necessary release prevention measures to be implemented as appropriate.

Regular inspections are conducted and preventative maintenance carried out in accordance with a Cyanide Maintenance Strategy, which includes a documented schedule for all cyanide related equipment to prevent unintentional release and for the protection of wildlife and human health. Records are maintained of all inspection, calibration and maintenance activities including corrective actions when identified.

The preventative maintenance system at CGO requires scheduled inspection activities for cyanide related work areas, equipment and facilities, including: tanks holding cyanide solution; secondary containments; leak detection and collection systems; pipelines, pumps and valves, and; ponds and impoundments.

Inspections are carried out on a frequency sufficient to verify that cyanide facilities are operating within design parameters.

**Standard of Practice 4.2**

Introduce management and operating systems to minimize cyanide use, thereby limiting concentrations of cyanide in mill tailings.

☑ in full compliance with

☐ in substantial compliance with Standard of Practice 4.2

☐ not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

The mine is in FULL COMPLIANCE with Standard of Practice 4.2, requiring that the operation limit the use of cyanide.

The mine has developed an extensive programme, using in-house and consultant firms to ensure that cyanide use is minimised. Changes in the ore type are well monitored through the mine planning process. The use of an in-line, amperiometric cyanide analyser provides effective cyanide control in the leach circuit.

The results from the bi-monthly cyanide speciation testing by external consultants are used to further optimise the cyanide addition rate. The cyanide control strategy is loaded into the process control system and automatically adjusts the cyanide addition flow rate. Cyanide usage is reviewed on a daily basis.
Standard of Practice 4.3

Implement a comprehensive water management program to protect against unintentional releases.

☑ in full compliance with

☐ in substantial compliance with Standard of Practice 4.3

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The mine 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.

The comprehensive and probabilistic water balance is implemented using a model designed for CGO that applies an industry standard modelling tool. The model is run quarterly to allow for the successful estimation of water movements and avoidance of overtopping of ponds and TSFs. Model input data, including site specific weather data is updated quarterly.

The mine Water Balance is comprehensive; it is probabilistic and is under frequent review. The water balance has been developed and operated in consideration of appropriate input parameters including:

- The statutory operational freeboard requirements for water storage at CGO, including TSF's;
- The inflows including the rate of tailings discharge, rainfall run-off within the upstream catchment and process water inflows;
- The design criteria storm event durations and return periods as specified in the Water Storage Facilities Operation Procedure;
- The rate of seepage;
- Inflows from drain down that may occur in a power outage; and
- The measured climatic conditions onsite, including evaporation rates.

The mine’s operating procedures incorporate inspection and monitoring activities to implement the water balance and prevent overtopping of ponds and impoundments and unplanned discharge of cyanide solutions to the environment.

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.

Evolution Mining - Cowal Gold Mine

Lead Auditor: John Miragliotta

Signature of Lead Auditor

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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

**Summarize the basis for this Finding/Deficiencies Identified:**

The operation is in FULL COMPLIANCE with Standard of Practice 4.4.

The operation does not have open waters where WAD CN exceeds 50 mg/L. The operation has strict regulatory conditions applied that limit the value of WAD CN in open waters to:

- 20 mg/L WAD CN (90th percentile averaged over 6 months); and
- 30 mg/L WAD CN (100th percentile – never to exceed)

Monitoring results reviewed over the audit period verified that these limits were not exceeded. Maintaining WAD CN concentrations within these limits in open water bodies is effective in preventing wildlife deaths at the Cowal operations.

Regular wildlife inspections and fauna mortality investigations are conducted in order to verify that fauna deaths recorded on site are not caused as a result of cyanosis.

**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

**Summarize the basis for this Finding/Deficiencies Identified:**

The operation is in FULL COMPLIANCE with Standard of Practice 4.5.

Based on evidence observed it has been determined that Cowal does not have a direct or indirect discharge to surface water. Lake Cowal is immediately adjacent to the mining operation and is an ephemeral water body. Within the mining lease there are some small ephemeral drainage lines.
The site is designed such that all water within the site operations area (and therefore potentially contaminated) drains internally towards a range of catchment dams. Surface water drainage features around the perimeter of the site divert water outside of the mine operations.

The site is designed to capture all surface water runoff within the operational area, which is directed to surface water point D5. D5 is a clay lined water storage dam. Both TSF cells are clay-lined and all three locations are engineered to a permeability of no greater than $1 \times 10^{-9}$, as required by Government development approvals. The process water dam is lined with high-density polyethylene (HDPE).

All cyanide facilities within the process plant footprint are constructed with secondary containment in place. A groundwater monitoring bore network is located throughout the mine lease. Groundwater monitoring results were reviewed during the audit period with results below limits of detection. Groundwater flow on-site is towards the pit void, as confirmed by external consultant reports.

**Standard of Practice 4.6**

Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of ground water.

- ☑ in full compliance with

The operation is
- □ in substantial compliance with Standard of Practice 4.6
- □ not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

The operation is in FULL COMPLIANCE with Standard of Practice 4.6.

The operation has determined that there are no beneficial users of groundwater in the area, other than the water requirements of the operation itself. Specific studies have determined that there are two groundwater aquifers in the area, one shallow and one deeper. There is no connectivity between these two aquifers. Specific reports conducted to determine groundwater availability for the operation also determined that there are no other users of groundwater identified in the area.

A groundwater monitoring bore network is located throughout the mine lease. Groundwater monitoring results were reviewed during the audit period with results below limits of detection. Groundwater flow on-site is towards the pit void.

Cowal does not have numerical standards for cyanide applied to its operation by the regulatory authority. The operation has a requirement to monitor and report WAD CN levels at various locations but no limits have been established. Cowal were observed to be complying with their requirement to monitor and report WAD CN levels in groundwater in their Annual Return.
Standard of Practice 4.7

Provide spill prevention or containment measures for process tanks and pipelines.

☒ in full compliance with

☐ in substantial compliance with Standard of Practice 4.7

☐ not in compliance with

Summarize 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.

Spill prevention or containment measures are provided for all cyanide unloading, storage, mixing and process solution tanks. The mixing, storage and process tanks have been designed and constructed such that they sit on a concrete ring beam with compacted fill in the centre and covering layers of concrete and asphalt to prevent potential leakage from migrating to the subsurface.

Secondary containments for cyanide unloading, storage, mixing and process tanks are sized to hold a volume greater than that of the largest tank within the containment and any piping draining back to the tank, and with additional capacity for the design storm event. The mixing and storage tanks are in a concrete bunded area, the volume of which is significantly more than 110% of the combined volume of the two storage tanks. The secondary containment surrounding the leach and adsorption tanks is capable of storing two of the largest leach tanks, which exceeds the volume required by the Code.

Procedures are in place and being implemented to prevent discharge to the environment of cyanide solution or cyanide-contaminated waters that are collected in the secondary containment areas. Secondary containment areas have been built with dedicated sump pumps and piping to redirect all such water back into the processing plant for reuse. There are no cyanide process tanks without secondary containment.

Spill prevention or containment measures are provided for all cyanide solution pipelines to collect leaks and prevent releases to the environment. The TSF pipeline is contained in a clay-lined bunded trench. Any releases from the pipelines that traverse unsealed areas outside of concreted secondary containment areas would be captured within the processing plant drainage system and directed to the impervious storm water catchment pond.

There are no areas where cyanide pipelines present a risk to surface water. Statutory licence conditions require that all water be retained on-site.
Cyanide tanks and pipelines are constructed of materials compatible with cyanide and high pH conditions. The cyanide ring main pipe work was replaced in 2016 in accordance with compatible design specifications and Australian Standards.

Cyanide tanks and pipelines are constructed of materials compatible with cyanide and high pH conditions. In 2007, engineering consultants were engaged by the operation to inspect the cyanide facilities at Cowal. They undertook a thorough assessment of Cowal in relation to this Standard of Practice and found full compliance at that time.

**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

**Summarize 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.

Quality assurance and quality control programs have been applied to all construction and modification works, addressing the suitability of materials, their fabrication and installation. Quality control and assurance records for all cyanide construction and modifications that have occurred since the original CGO certification in 2007 have been retained. Examples examined during the audit covered the replacement of the cyanide storage tank, cyanide ring main pipeline and the south TSF expansion. These works were subject to design review, construction QA/QC and post construction inspection by appropriately qualified persons.

**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

**Summarize the basis for this Finding/Deficiencies Identified:**

The operation is in FULL COMPLIANCE with Standard of Practice 4.9.
The operation has a range of written documentation outlining how monitoring is to be conducted on site, developed by appropriately qualified personnel.

The procedures reviewed outlined requirements for equipment, handling and transportation of collected samples. This document also includes all monitoring locations where samples are to be taken.

A Monitoring Quality Assurance Checklist is utilised to record a range of data including calibration of equipment, chain of custody data and dispatch date. These checklists were reviewed for the audit period and have been completed accurately.

Cowal monitors for cyanide in both surface water and groundwater locations around the site. These monitoring programs have been developed to meet regulatory compliance requirements and the programmes are reviewed and approved by the Regulators.

Although Cowal does not have a direct discharge of process water to natural surface water, operational surface water locations that may contain cyanide are monitored for presence of cyanide.

A groundwater monitoring bore network is located throughout the mine lease. Groundwater monitoring results were reviewed during the audit period with results below limits of detection.

The operation inspects and records all wildlife mortalities on site, as required under its Development Consent approval.

Monitoring is conducted at appropriate frequencies adequate to characterise the medium being monitored and to identify any changes in a timely manner.
PRINCIPLE 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 the cyanide facilities to protect human health, wildlife and livestock.

☑ in full compliance with

☐ in substantial compliance with Standard of Practice 5.1
☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:
The operation is in FULL COMPLIANCE with Standard of Practice 5.1.

Decommissioning of cyanide facilities is captured in two primary documents, these being the overall Cowal Gold Mine - Mine Closure Plan (MCP) and the specific Cowal Gold Mine Decontamination and Decommissioning Plan (DDP) – Processing Facilities.

The MCP was most recently updated in December 2014 and is due for next review in 2019. This document covers overall mine closure requirements, processes and costs, of which the decommissioning of cyanide facilities is part.

The DDP includes decommissioning of all cyanide facilities on site. The DDP includes an implementation schedule, which commences 24 months pre-closure through to 24 months post closure.

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

☑ in full compliance with

☐ in substantial compliance with Standard of Practice 5.2
☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:
The operation is in FULL COMPLIANCE with Standard of Practice 5.2.
The operation has developed an estimate of the costs to fully fund third party implementation of its DDP. The costs presented in the DDP are for an external contractor to undertake decommissioning works.

The Decontamination and Decommissioning Plan (DDP) was last revised in 2014 and is due for further review in 2019. Decommissioning costs are revised annually and included in the overall mine closure cost estimate.

Cowal has commissioned a bank guarantee to cover the overall costs of mine closure. This total amount is approved and held by the Department of Resources and Energy in accordance with the statutory approved financial mechanism provisions that CGO operates within.
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

☐ in substantial compliance with Standard of Practice 6.1

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 6.1.

The operation has developed procedures describing how cyanide related tasks such as unloading, mixing, plant operations, entry into confined spaces, and equipment decontamination prior to maintenance should be conducted to minimise worker exposure.

The procedures reviewed require personnel to don appropriate personal protective equipment (PPE) and to conduct pre-work inspections (Take 5) prior to the commencement of a task. All employees and contractors working on the site are required to undertake a Job Hazard Analysis prior to undertaking any task.

Prior to commencing work at the processing plant, contractors and employees have to complete a General Site Induction and then a Processing Specific Induction. During the inductions and training, the appropriate PPE for the areas, and task specific PPE, is highlighted. A Cyanide Awareness Presentation is included within the induction for workers accessing cyanide areas. This presentation includes details on PPE for cyanide specific tasks. The level of PPE is increased for tasks involving cyanide. The hazards associated with the task, and the PPE required form an integral part of the procedures.

The operation has developed change management 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 operation does solicit and actively considers worker input in developing and evaluating health and safety procedures. A review date is selected based on the criticality of the procedure. The review includes consultation with the employees and checks by the supervisor and approval by the manager.
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 ☐ not in compliance with Standard of Practice 6.2

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 6.2.

From test work, the operation has determined the appropriate pH for limiting the evolution of HCN. Cyanide is dissolved, by sparging, in the delivered isotainer. Target pH levels have been defined for the mixing and production processes and is greater than pH10 in all areas.

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. Fixed hydrogen cyanide analysers are in place in areas that were determined to be at the highest risk, as an outcome of a risk workshop. The fixed monitors are linked to the control system and initiates alarms.

The operation has identified areas and activities where workers may be exposed to cyanide in excess of 10 ppm instantaneously and 4.7 ppm over an 8-hour period and require use of PPE in these areas or when performing these activities.

Portable and fixed HCN monitors are maintained, tested and calibrated as per manufacturer requirements.

The supplier Orica has historically incorporated dye into their product. This is checked as part on the sparging process.

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.

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. Control of the maintenance, inspection and testing being via the Pronto preventative maintenance system.

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.
Safety Data Sheets (SDS), first aid procedures and informational materials on cyanide safety were available in the language of the workforce (English) in areas where cyanide is managed.

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

**Standard of Practice 6.3**

Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

☑ in full compliance with

☐ in substantial compliance with

☐ not in compliance with

**Summarize 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: two-way radios for all process plant operational personnel, closed circuit television in the process plant, potable water, cyanide antidote kits, medical oxygen, resuscitation and defibrillation equipment, trauma kits, and 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 plan to respond to cyanide incidents, including the treatment of exposures.

Cowal has a dedicated emergency response officer (ERO) 24 hours a day seven days a week. There is also a fulltime emergency response coordinator (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 kit.
The operation has established a system to transport patients to hospital utilising NSW Ambulance Service and has advised this requirement to them. The requirements of West Wyalong Hospital has also been communicated. In the event of a cyanide exposure incident, an ambulance is called to the site to transfer the patient.

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, has provided the hospital with two current cyanide antidote kits and provided training about cyanide risks and treatment.

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.
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

Summarize the basis for this Finding/Deficiencies Identified:

The Mine 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.

The Emergency response plan (ERP), Cyanide Emergency Plan (CEP) and the Incident Management Team Plan (IMTP) work together and articulate Emergency Responses in detail including systems to support the response.

The CEP considers the potential cyanide failure scenarios with specific operating and environmental scenarios. The CEP was designed around the Cyanide Code and consequently details specific response actions.

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 an emergency is provided by the cyanide supplier (Orica) in accordance with the supply contract.

CEP, IMTP and ERP addresses the notification of potentially affected communities by means of activating the CMR Team upon escalation of a potential incident. Section 4.11 of the CEP details the first aid procedure to be followed in the event of a cyanide exposure incident.

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
Summarize the basis for this Finding/Deficiencies Identified:

CGO has identified and made potentially affected communities aware of the nature of their risks associated with accidental cyanide releases. The ERP is a publicly available document, which allows for public review and comment.

Cowal Gold Mine attends six-monthly meetings of the Local Emergency Management Committee (LEMC) that is comprised of representatives of Cowal Gold Mine, the local fire brigade, local Councils, police, ambulance service, local hospital, power utilities and water supply authority. The CEP has been presented to off-site emergency responders at LEMC meetings. The ERC uses the LEMC forum to table the Cowal ERP and CERP for stakeholder comment.

Cowal provides a range of opportunities for stakeholders to communicate any issues of concern. The operation employs Community Relations personnel who are responsible for stakeholder relations at Cowal. Evolution Cowal has community complaint mechanism with details advertised on their website and in newspapers on a frequent basis.

The Emergency response coordinator advised that the local community and local emergency services are informed of updates to the ERP and CEP and changes to emergency response capabilities as part of regular Community Environment Monitoring Consultative Committee (CEMCC) meetings.

**Standard of Practice 7.3**

Designate appropriate personnel and commit necessary equipment and resources for emergency response.

☑ in full compliance with

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Mine is in FULL COMPLIANCE with Standard of Practice 7.3.

The Emergency Response Plan describes in sufficient detail the necessary information for responding to cyanide emergency situations. The content identifies the incident management team responders and describes the team roles, organisational relationships, training needs and equipment requirements. The Emergency Response Procedure includes the maintenance and inspection schedules for emergency response equipment. The plan also adequately describes the relationship with and roles of external response organisations.
The mine has confirmed that external emergency responders referred to in the ERP are aware of their involvement and are included as necessary in mock drills or implementation exercises.

**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 ☐ not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

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

The Emergency Response Plan, Incident Management Team Plan, Mine Emergency Team List and Cyanide Emergency Plan 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, the public, media and corporate will be requested from the site Emergency Controller only with direct consultation with the Incident Management Team Leader (GM), this is done in accordance with trigger cards in the Incident Team Management Plan.

Included in the plans are Notification of Authorities and Neighbours, Interaction with Emergency Services and Public Relations and Debriefing of stakeholders. The responsibilities for this are included in the duty cards

**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 ☐ not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

Cowal is in FULL COMPLIANCE with Standard of Practice 7.5 requiring response plans and remediation measures are incorporated into monitoring elements that account for the additional hazards of using cyanide treatment chemicals.
The CEP and related documents do describe specific remediation measures as appropriate for the likely cyanide release scenarios. The operation has assessed potential for impacts on drinking water concluded that cyanide related incidents on site would not threaten drinking water supplies. Accordingly, provision of an alternate drinking water supply is not deemed necessary.

Considerations are made within the emergency plans 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 emergency response procedures state 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.

The spill response procedure require that spills be reported to the CGO environmental personnel 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
- in substantial compliance with
- not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

The Mine 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 at least annually and following any emergencies or drills. Mock emergency drills involving cyanide related scenarios are scheduled yearly.

The Emergency Response Coordinator schedules training for Emergency Response Team 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 emergency plans and associated procedures after any cyanide related emergency. The requirement for review to the emergency plans and procedures is also triggered at the post drill review.
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

Summarize the basis for this Finding/Deficiencies Identified:

CGO 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 trains all personnel who may encounter cyanide in cyanide hazard recognition. The training includes:

- General Site Induction for all persons entering the site, which includes information on hazardous chemicals held on-site, including cyanide to make people aware. This is refreshed every two years.

- Cyanide Awareness presentation for all workers which addresses exposure routes, symptoms of poisoning, first aid and safe handling. Refresher training is scheduled to be conducted every 12 months.

- Processing Induction for personnel who are entering the processing area (unless 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. All operations personnel are required to annually read and sign-off having read the eight nominated cyanide-related procedures, as documented in the Procedure Sign-off Sheet Cyanide Code Compliance.

- Cyanide Worker Package for employees who are expected to be at a higher risk of encountering cyanide, including process operators, gold room operators, maintenance electricians and fitters and technical staff. This presentation includes further details of site-specific hazards and control methods that are in place in and around the processing area. Cyanide Worker Package refresher training is scheduled to be conducted on an annual basis.

All training requires knowledge assessments that are completed, signed and documented. Prior to working independently employees are trained in cyanide related tasks. The training is conducted one on one by qualified crew trainers or under the guidance of the Shift
Supervisor. Training records are kept electronically in the QHSE database and a mirror back up of the database maintained.

**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

☐ in substantial compliance with ☐ not in compliance with Standard of Practice 8.2

**Summarize the basis for this Finding/Deficiencies Identified:**

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

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 operation has a tiered induction process that needs to be completed prior to working with cyanide, which includes a site induction, cyanide awareness training, area inductions (e.g. Processing) and a Cyanide Worker Package and Assessment. This training includes Job Hazard Analysis (JHA) and Take 5 hazard evaluation. On the job training is delivered through one on one sessions, as directed by the applicable Training Plans, which involves following the SOP with the trainee, demonstrating the steps and explaining the hazards. Sign-off forms are used to record training progress. Training records verify that all personnel on site had been through the required cyanide/induction training relevant to their position.

The training requirements for each job are identified in specific Training Plans that must be completed before the employee is deemed fully competent in their role. The Training Plans reference the applicable cyanide-related tasks from operating procedures and manuals.

Appropriately qualified personnel provide task training related to cyanide management activities. Refresher training on cyanide management is provided periodically according to defined schedules to ensure that employees continue to perform their jobs in a safe and environmentally protective manner. Records of the refresher training and assessments are filed in individual training files and have been recorded in an electronic training system.
The operation evaluates the effectiveness of cyanide training using written assessments and on-the-job observations. All training packages require a competency assessment to be completed which has been recorded electronically as well as hard copies in the site filing system. Following the initial training, all new starters are assigned a buddy until they have been deemed competent in that area.

The operation evaluates the effectiveness of cyanide and other training using written assessments and on-the-job observations. All training packages require a competency assessment to be completed. Following the initial training, all new starters are assigned a buddy until they have been deemed competent in that area.

Records are retained throughout an individual’s employment documenting the training they receive. The records 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.

**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
- □ not in compliance with

**Summarize 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.

Cyanide unloading, mixing, production and maintenance personnel are trained in the procedures to be followed if cyanide is released. Processing workers are trained in responding to a release of cyanide, including raising the alarm. Response to worker exposures or catastrophic releases of cyanide is responsibility of the ERT and emergency management team. Review and sign-off of procedures by employees and their supervisors in the processing area is undertaken annually.
Cyanide emergency response personnel are trained in decontamination and first aid. Principals of first aid and decontamination are provided within the cyanide awareness presentations that are completed by all personnel working in the processing plant area. The ERT are the primary responders to cyanide emergencies including worker exposures and hold training certification addressing first aid, mine emergency response and rescue, and rendering hazardous materials safe.

The emergency response personnel participate in routine drills to test and improve their performance. Emergency response members receive training in the procedures contained within the Cyanide Emergency Response Plan (CERP) regarding cyanide, including the use of necessary response equipment. The operation has made off-site emergency responders, such as community members, local responders and medical providers, familiar with those elements of the ERP and CEP related to cyanide.

External agencies and rescue professionals are invited to attend periodic emergency mock drills on-site.

Refresher training for response to cyanide exposures and releases is conducted regularly and refresher training records are maintained detailing the names of the employee and the trainer, the date of training, the topics covered, and how the employee demonstrated an understanding of the training materials, which is via observation and/or written assessment.

The operation has conducted mock cyanide emergency response drills involving ERT response to cyanide exposures and spills. 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. Typically, the actions referred to further training in an aspect of the drill. Actions are registered and tracked through the site’s QHSE Management System. Records are retained documenting the cyanide training, including the names of the employee and the trainer, the date of the training, the topics covered and how the employee demonstrated an understanding of the training materials.
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

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 9.1.

CGO provides a range of opportunities for stakeholders to communicate any issues of concern regarding cyanide management at Cowal.

CGO has community complaints details advertised on their website. All statutory approval documents including the Cyanide Management Plan and results of monitoring data are also available on the website.

The operation also provides additional communication avenues that are used to communicate cyanide management and performance including:

• Adverts in local media publications;
• Community open days;
• Internal and external publications; and
• Community group meetings.

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
Summarize the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 9.2. The operation provides a range of opportunities for interaction with stakeholders on cyanide management practices on-site.

Evolution Cowal has community complaints details advertised on their website. All statutory approval documents including the Cyanide Management Plan are also available on the website.

The operation also provides additional communication avenues including:

- Adverts in local media publications;
- Community open days;
- Internal and external publications; and
- Community group meetings.

**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 ☐ not in compliance with Standard of Practice 9.3

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 9.3.

A range of written descriptions has been developed relating to cyanide management on site which has been made publically available. Much of this information is available on the Evolution Cowal website, including the Cyanide Management Plan and associated addendums.

Written information related to cyanide management is provided to local communities through community newsletters and at community open days in addition to information published on its website. The operation has mechanisms in place to make information publically available on the list of events contained within this Standard of Practice, although has not had to do so in the audit period.
Each year the operation reports environmental information in their Annual Environmental Return (AER). This report includes information related to cyanide management and a summary of all incidents for the reporting year. The AER is publically available on the Evolution Cowal website.