INTERNATIONAL CYANIDE MANAGEMENT INSTITUTE

Cyanide Code Compliance Audit Gold Mining Operations

Recertification Summary Audit Report

Gold Fields St Ives Gold Mine Australia

21st – 27th April 2012

Name of Operation:	St Ives Gold Mine
Name of Operation Owner:	Gold Fields Ltd
Name of Operation Operator:	Gold Fields Ltd
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Location details and description of operation

St Ives is located 80 kilometres south of Kalgoorlie, near Lake Lefroy in the Eastern Goldfields region of Western Australia.

About 5 million tonnes of ore, comprising 2.0 million tonnes from underground and 3.0 million tonnes from the open pit operations, are treated annually using a single stage closed circuit SAG mill and CIP technology. An additional 2.65 million tonnes are treated by heap leaching. The milling circuit includes a 13MW gearless motor drive SAG Mill, which is variable speed and bi-directional. A comprehensive gravity circuit ahead of leaching is designed to recover 30% of the gold. The recovery circuit consists of a five tank leach train, six stage pump cell circuit with an active carbon inventory of 30 tonnes and 15 tonnes in the stripping/regeneration circuit.

Auditor's Finding

This operation is

X in full compliance

☐ in substantial compliance

☐ not in compliance

with the International Cyanide Management Code.

This operation has experienced compliance problems during the previous three year audit cycle and these are discussed in 4.1 and 4.4 below.

Audit Company: Eagle Environmental

Audit Team Leader: Arend Hoogervorst

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Names and Signatures of Other Auditors:

Name : Dawid M. L Viljoen Signature _____ Date: 11/2/13

Dates of Audit: 21st – 27th April 2012

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.

Facility	Signature of Lead Auditor	Date
St Ives Gold Mine		11/2/13

Auditor's Findings

1. PRODUCTION: Encourage responsible cyanide manufacturing by purchasing from manufacturers who operate in a safe and environmentally protective manner.

Standard of Practice1.1: 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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 1.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
There is a Gold Fields Australia cyanide supply contract, covering Gold Fields St Ives Gold Mine and Gold Fields Agnew Gold Mine, in place with Australian Gold Reagents (AGR). The contract requires that the supplier of cyanide must be a signatory to, and certified by, the ICMC for production and transportation of cyanide. The Supplier is further required to provide necessary documentation to conform to the contract requirements. AGR is a signatory to the Cyanide Code and was re-certified as a fully compliant Production Facility with the ICMI Cyanide Code on 24 November 2010.

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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 2.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
There is a Gold Fields Australia cyanide supply contract, covering Gold Fields St Ives Gold Mine and Gold Fields Agnew Gold Mine, in place with Australian Gold Reagents

(AGR). The contract covers both production and transport to the mine sites. AGR produce the cyanide and transport the liquid cyanide from their production site at Kwinana to Kalgoorlie station via rail, and from Kalgoorlie station to site at St Ives using road transport. It also specifically covers the responsibilities and requirements for transport, safety, security, unloading, emergency response (spills prevention and clean-up), route planning and risk assessments, community liaison, emergency response resource access and availability, training, and communication.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 2.2**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Gold Fields Australia cyanide supply contract, covering Gold Fields St Ives Gold Mine and Gold Fields Agnew Gold Mine, in place with Australian Gold Reagents (AGR) is valid to 30th July 2012. AGR Western Australian transport chain was re-certified as fully compliant on 20th April 2010. The operation has chain of custody records identifying all elements of the supply chain.

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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 3.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The operation uses only liquid cyanide, delivered by bulk tanker, and no mixing or storage of solid cyanide takes place on site. The site offloading and storage facilities were designed and built for cyanide producer AGR (who own them), in accordance with sound and accepted engineering practices, with materials appropriate for use with cyanide and

are located in a concrete bund and steel containment tank. Cyanide facilities are situated away from offices and workshops and are also fenced, locked, as well as being located within a wider mining lease area which is security controlled. The tanks are located in open air with ventilation pipes at the top. No surface water or communities are close by. The tankers unload on a concrete pad which drains into the storage bund area.
The tanks are equipped with manual and electronic level measurement devices as well as telemetry devices. Tank level data is sent to the supplier (as well as to the control room on site) to enable appropriate scheduling of deliveries which both ensure sufficient cyanide availability and prevention of tank overfilling. A high level alarm will communicate in the control room.

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.

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 3.2**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
Only liquid cyanide is used and is delivered via bulk tanker to storage tanks and no mixing or storage of solid cyanide takes place on site. The cyanide offloading procedures are detailed, spelling out PPE requirements, use of a sentry/observer in the process, and are clearly sequenced to prevent spillages and accidental releases during off-loading.

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.

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 4.1**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Lefroy mill site and Heap Leach have a series of integrated procedures covering various operational aspects which includes cyanide specific tasks and safeguards and responses to normal, abnormal and emergency conditions. Activation of abnormal and emergency components of these procedures reduced the magnitude of exceedances by 15-30%. However, duration of exceedances were dictated by stockpile volumes, circuit volumes, water availability and the proportion of water recycled. Additional measures implemented since the original exceedances include the inclusion of more comprehensive copper analysis within the future ore testwork program and the commissioning of a high TDS water source to assist with maintaining TDS levels.
The sites are also EMS ISO14001 and OHSAS 18001 certified. Procedures include engineering, processing, EHS, environmental and OHS. Currently no cyanide regeneration or destruction systems are used. TSF Management Plans and procedures are in place for the TSFs. All cyanide equipment is included in the SAP planned maintenance inspections. PMS (Planned Maintenance System) inspections are driven by the SAP system using Reliability Centred Maintenance (RCM) based frequencies. Operational inspections are done daily and monthly by the Operations and quarterly by the Environmental Department. These inspections cover tanks, pipes, pumps, valves, secondary containments, ponds and impoundments located in the plant and the TSFs. Cyanide tank, leach and CIP tanks storage maintenance and inspection records were available from 2009 to 2012 and were sampled and reviewed. At the Heap Leach, the process water pond is equipped with a double liner and a leak detection system. The Plant is equipped with adequate storm water and emergency containments so there is no need for the use of emergency power to prevent unintentional releases. However, emergency power is available and maintained as a part of the St Ives Heap Leach Solution Management Plan. The TSF will collect water on the pool and will only release water to the return dam once power is restored to the return water pumps, in the event of a power failure. A change management procedure covering health, safety and environment is in place and operational examples reviewed indicated that the process is used effectively.

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

X in full compliance with

The operation is
- □ in substantial compliance **with Standard of Practice 4.2**
- □ not in compliance with
- □ not subject to

Basis for this Finding/Deficiencies Identified:
As a base, Mill test work for all different ore types (13 in all) was conducted during the design phase of the plant. Diagnostic leaches are also conducted on tailings to assist with

process optimisation. On-going evaluation of future ore variability is also done to determine parameters for planned mixes.
A LT5 TAC-2000 inclusion program with the objective of reducing cyanide consumption is in place. The second phase of the program includes stage addition of cyanide and cyanide concentration data reviewed demonstrated a reduction in cyanide in tails from 172 to 137 ppm and resulting in cyanide consumption reduction from 0.43 to 0.33 kg/t.
At the Mill, use is made of a TAC 2000 cyanide controller and a PLC driven dosing protocol, controlling reagent strength cyanide dosing pumps, backed up with manual titration at strategic points. Cyanide cascade control, using an additional TAC 2000 on line analyser on no 5 Leach Tank was implemented, as well as controlling the pH at 10 from 9.6.
In the case of the Heap Leach, use of manual control based on manual titrations was reviewed. Barren cyanide solution addition at the agglomeration drum is PLC controlled in ratio with feed tonnage to the drum.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.3**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
For the Mill and TSF, An Excel based spread sheet water balance model is used, taking the variation in rainfall and evaporation into consideration. For the Heap Leach, a study was undertaken using the Siberian model, which included precipitation events, and identified pond requirements up to Stage 6 (the operation is currently at stage 3), and identifying need for additional capacity. There have been no changes in process or rainfall data affecting the water balance since this water balance was developed at the certification audit.
The TSF is managed with a minimum of 300 mm freeboard and TSF return water pond level indicators installed, report into the SCADA at the control room, alarming at 95%. The TSF is inspected 3 times daily. Level sensors are installed on ponds, with no alarm condition in storm water pond 2, a level alarm in no 1 pond and a management system in place to control levels. The Heap Leach Water Solution Management Plan details procedures to manage the heap leach water balance. Heap leach ponds require 300mm freeboard. The heap leach storm water dam 2 is the emergency pond and is operated as low as possible, preferably empty.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.4**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The site implemented the study (Cyanide Ecotoxicity at Hypersalinity Gold Operations, Meriwa Report No. 273) recommendations which allow for a spigot WAD CN level of below 112 ppm (80% of the time) and 132 ppm (95% of the time) at a TDS level of above 50 000ppm and a copper level of below 50 ppm. The broad premise was that if the TDS levels were high, birds would not drink the saline water and thus the WAD cyanide levels could be higher without posing a risk. Several excursions from these criteria have been recorded during the period since certification. During 2010, treatment of an ore source containing high soluble copper caused discharge WAD CN concentrations to exceed the target for several months. Once the source was identified, blend proportions of this source were modified to reduce the copper level within the system. The practice of dilution through the tailings thickener was implemented during this time. This reduced the magnitude, but, however, was not able to prevent the period of exceedance.
Analysis of spigot WAD CN concentration over the entire period since certification shows concentrations below 112ppm for 82% of the time and below 132ppm for 85% of the time. Since the beginning of Q4 2010 (post treatment of problematic ore), WAD CN concentrations have been below 112ppm 96% of the time and below 132ppm 98% of the time.
Depositions of tailings for the majority of 2011 were into North Orchin pit. During this time, decant TDS levels were in excess of the target 50,000ppm mark. When deposition returned to TSF3, TDS levels gradually dropped to below 50,000 TDS over 3 months to Q1 2012. A saline production bore that was commissioned with the North Orchin pit was introduced at this point to raise the TDS level. However, it was discovered that the saline production bore water percolated back into the filter rock when tailings deposition was not directed to North Orchin rendering the bore ineffective. Delays in modifying the bore discharge point resulted in a prolonged period of operation below 50,000ppm TDS.
A review in late 2011 by authors of the original study assessed risks to the system and looked at incidents of non-compliance. It deemed risk to wildlife to be low at the times of non-compliance due to lack of overall visitations, lack of threatened species visitations and above seawater salinities during migratory seasons. While risk was identified as low, compliance with the M398 study parameters was still recommended to ensure the protective mechanism is maintained. A new cyanide control strategy implemented in 2012 has reduced the free cyanide concentrations exiting the plant by approximately 35ppm. In the case of the heap leach, all solution trenches are filled with gravel, the No 1 dam at the heap leach is covered with bird netting to prevent access to the pond and procedures require bird netting to be installed if abnormal ponding conditions on the heap leach cannot be corrected.
The auditors have considered carefully the non-compliances that have occurred and reviewed the procedures and mitigations that have been undertaken to manage these. They have also taken into account operations limitations caused by ore changes, blending

issues, varying salinity levels, circuit volumes, copper inventories within the processing plant, time needed to drill additional bores, along with the Report " Assessment of risk to wildlife at the tailings storage facilities: Goldfields St Ives Gold Mine" Smith, G. B., and Donato, D.B. (2012) which concluded that although the risk during the deficiency period was not substantial it was recommended that the original criteria set in Meriwa Project M398 (II) of 26 August 2008 still be targeted. They subsequently believe that there has been a good faith effort to remain in compliance, and to correct its deficiencies and return to full compliance once the deficiencies occurred, as soon as was practical and operationally feasible.

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

X in full compliance with

The operation is

- □ in substantial compliance with **Standard of Practice 4.5**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
No direct discharge to surface water takes place. All return water from TSF is piped to return water ponds, which in turn is pumped back to the Lefroy mill process water tanks. At the heap leach, no direct discharge to surface water takes place. All heap leach pads are equipped with geomembranes and all solutions drain into the various solution tanks and lined solution ponds. All solutions are re-used on the plant. No indirect discharge to surface water takes place as there is no surface water in the form of rivers close to the operations. All water in the area is hyper saline water. Boreholes are used to monitor any potential contamination of the saline lakes via seepage.

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

X in full compliance with

The operation is

- □ in substantial compliance with **Standard of Practice 4.6**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified
There are no downstream identified beneficial uses. The operation manages seepage from the TSF by analysing various boreholes strategically placed around the operations. Cut off trenches are in place around the TSF, with minibores used to return TSF seepage, as well as for monitoring seepage. Production bores are used to recover larger volumes of seepage from the TSF to the decant ponds, from where the return solutions are pumped

back to the mill. These arrangements are linked to Licence requirements. The Water Authority of Western Australia stated the only beneficial users for saline groundwater are for mineral processing, and no human uses are identified.
With regard to the heap leach, similarly, there are no identified beneficial users of ground water down gradient of the operation. The heap leach pads are designed with double liners, the new agglomeration section is placed on lined surfaces, including all conveyors to the grasshopper stackers at the heap leach. Heap leach ponds are double lined and equipped with leak detectors. All solution pipes containing cyanide are placed in lined trenches, draining to the solution ponds.
Material from the top of the dam is used as paste fill for underground. Samples of feed tailings material to the paste fill plant are taken quarterly and analysed for cyanide to determine if any WAD cyanide risk exists. Sampled quarterly reports show all values are at <0.5 ppm WAD CN. A report for Leviathan and Argo underground mines paste fill plant work, prepared for the paste plant approval permit, concluded that the risk of contamination to ground water and potential impact is negligible.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.7**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Mill Reagent strength cyanide storage tanks are placed in a concrete bund area, the leach tanks are placed on ring beams and placed within a concrete bund, leach tanks are subject to comprehensive thickness testing done to predict potential leakage, and the SAP PMS (Planned Maintenance System) system is used for preventative maintenance of tanks. Leak detection pipes are fitted to the ring beams and monitored according to a set procedure. Pump cell tanks are placed on a solid concrete foundation within a bund area.
At the heap leach, the reagent strength cyanide storage tank is placed on a solid concrete plinth in a steel bund area. The Elution tank and CIS tanks are placed on top of a concrete bund area with limited capacity in case of spillage. This bund currently drains into the water storage with sufficient capacity to handle the required volume of any potential overflow. Procedures are in place in the solution management plan to add raw water to any overtopping or tank leakage for dilution.
In the mill, an emergency secondary containment earth dam was constructed to take up leakages from the thickener and leach bund areas with a combined volume of 2,300 m^3. The emergency secondary containment (volume 1,600m^3) is connected to the storm water dam (60,000m^3) giving a combined connected secondary containment for the leach, thickener and residue of 64 253m^3. At the heap leach, the bund area for the CIS and elution tanks includes the event pond with a spillage containment of 8,200m^3. The biggest tank size is the liquor storage bund at 116m^3. The Mill and Heap Leach Plant are

designed with sumps and pumps to return all spillage solutions back to their relevant processes.
All TSF pipelines are placed within an earth trench. The trench is equipped with emergency collection ponds at specific strategic low points along the delivery route to the TSF's. All spillages are investigated. All TSF pipelines are either lined with HDPE or made of HDPE to minimise risk of line failure. At the Mill, Reagent strength HDPE piping situated over uncovered ground is equipped with secondary containment in the form of an HDPE pipe. All process pipelines are placed above concrete bunded areas. At the heap leach, all cyanide solution pipelines are installed in lined trenches, except the reagent strength pipelines. Reagent strength HDPE piping situated over uncovered ground is equipped with a "pipe in a pipe" secondary containment system, draining back into the reagent strength cyanide storage bund and / or the CIS concrete bund. All pipelines are placed in the SAP PMS system.

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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.8**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Quality control records and inspections for reagent strength cyanide tanks were commissioned by the tank's owners, CSBP/AGR, and were sighted, as well as QC records for the entire mill. TSF 4 is being constructed and is expected to be commissioned by the next re-certification audit. The design documentation of North Orchin HDPE return line was reviewed and pipe specifications and weld specifications for each pipe length in a detailed spread sheet, including an acceptance column, were checked. A Tailings Storage Audit and Management review in 2011 concluded that the TSF can continuously be safely operated provided the recommendations on operational aspects and monitoring contained in the report were followed.
Supporting the QA /QC records during construction of the plants were sighted and reviewed. The Lefroy mill and heap leach plants were subject to a corrosion management audit and the plant is covered by a reliability centred, maintenance management system, based and controlled by the SAP PMS system.

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Environmental monitoring procedures are in place which include water sample handling and preservation (including WAD cyanide), preservation and dispatch of WAD cyanide samples and the chain of custody requirements.
A series of boreholes are sampled and analysed for WAD cyanide to monitor for any cyanide discharges to ground water. A sample of quarterly environmental borehole reports for 2010, 2011 and 2012 show no WAD cyanide values exceeding 0.5ppm.
Supernatant water and TSF spigots are sampled daily 5 days per week, environmental samples are taken quarterly and all boreholes are sampled once per quarter, as dictated by government requirements. Any changes in frequencies must be approved via the government department. Bird mortality inspections are conducted daily, no surface water samples are needed.

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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 5.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
As the reagent strength cyanide storage tanks are owned by AGR CSBP, their procedure, "Sodium Cyanide Solution Storage Facility Decontamination" is used and includes flushing and hypochlorite decontamination. The St Ives Gold Mine Closure Plan also includes Cyanide Code requirements. Implementation schedules for cyanide decommissioning are in place and they are the same as for the certification audit as there have been no changes since then. The Plan is reviewed at least bi-annually and updated as and when new facilities are commissioned.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 5.2**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Cost estimates dated March 2011 for St Ives Gold Mine were sighted in the Review of Mine Closure Provision Report. Specific closure cost estimates for Lefroy Mill remediation of contamination and the Heap Leach were sighted. The AGR contract makes provision for the decontamination of the reagent strength cyanide storage and offloading facilities, as they own the facilities. Review is undertaken annually by internal staff and by an external source at least every 5 years.
The Western Australian Government, under the provisions of the Mining Act of 1978, requires a bond as per the environmental performance bond.

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 or control them.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 6.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Lefroy mill site and Heap Leach have a series of integrated procedures covering various operational aspects which includes cyanide specific tasks and safeguards. The sites are also EMS ISO14001 and OHSAS 18001 certified. Procedures include engineering, processing, EHS, environmental and OHS. Currently no cyanide regeneration or destruction systems are used. TSF Management Plans and procedures are in place for the TSFs. All cyanide equipment is included in the SAP planned maintenance inspections. PMS (Planned Maintenance System) inspections are driven by the SAP system using Reliability Centred Maintenance (RCM) based frequencies. Operational inspections are done daily and monthly by the Operations and quarterly by the Environmental Department. These inspections cover tanks, pipes, pumps, valves, secondary containments, ponds and impoundments located in the plant and the TSFs. Cyanide tank, leach and CIP tanks storage maintenance and inspection records were available from 2009 to 2012 and were sampled and reviewed. At the Heap Leach, the process water pond is equipped with a double liner and a leak detection system. A change management procedure covering health, safety and environment is in place and operational examples reviewed indicated that the process is used effectively.
The use of signage to identify confined spaces, cyanide hotspots and other areas was confirmed during a site inspection. Routine tasks are conducted using detailed work instructions. Non routine tasks require job hazard analyses (JHA) which include pre-work

inspections and precautions, isolation permits, and confined space entry permits as appropriate. The site has an integrated EHS system. Within the system the environmental standards include a specific cyanide management standard, chemical management, tailings management, water management, waste management and air quality management. A separate set of critical hazard standards is in place which includes integrated safety management issues. All procedures where cyanide solution or HCN gas may be present contain a prominent, boxed, "Cyanide Warning", on the front page warning of the possibility of cyanide solutions or HCN gas. There is a requirement to wear a personal HCN gas monitor, have knowledge of the nearest safety shower and emergency cyanide PPE storage unit. The warning also requires avoidance of contact with solutions and process slurries and requires mandatory PPE where contact with concentrated cyanide solution is possible.
Worker input is considered in risk assessments, monthly Safety meetings, and mock cyanide drills.

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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 6.2**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Test work on optimising pH resulted in increasing the pH to 10.0, which resulted in lower cyanide consumption. HCN measurements by mobile monitors indicated lower incidents of exceedances. Operational specifications were subsequently changed and pH changes since certification from 9.4 to 9.6 to 10.0 resulted in a lowering of health, safety and environmental impact and residual cyanide values in the tailings. At the heap leach, cement and lime is added to the mix in the agglomeration operation ensuring the pH of solution onto the heap is above 10.0, averaging 10.38.
All staff working on the mill, gravity leach and pump cell, elution and thickener areas must wear mobile HCN gas monitors. Contractors are issued with monitors on a job specific basis. Fixed monitors are not used as all employees in risk areas carry personal monitors. Staff working in the heap leach wet plant and agglomeration drum areas are using personal HCN monitors. Shift exposure logs can be downloaded.
A formalised mill and heap leach hotspot survey was completed and the decision was made to wear personal monitors in controlled areas. The personal monitor data is downloaded and stored and no high cyanide gas values were detected. The responsibility for management of HCN monitoring equipment and associated data rests with the Mine Occupational Hygiene Department.
On-going inspections and checks are also used to monitor and check facilities and emergency response equipment functioning and checklists covering three years since

certification were sampled. Safety equipment such as safety showers, low pressure eye wash stations, and fire extinguishers are numerous and adequately signposted. MSDS and first aid information is available in English.
Eating and drinking is only allowed in dedicated areas and this is indicated on signs and trained and reinforced during annual induction of contractors and plant staff. Cyanide pipelines are labelled and include directional flow. Accident and incident reporting and investigation procedures, based upon the site safety reporting requirements, were found to be in place and effective.

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 6.3**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
All staff are equipped with radios to raise alarms on channel 2. Telephone no 45 is used for telephonic alarm with PA phones available at substations. Safety showers, equipped with fresh water, are placed at strategic positions. There are evacuation alarms in place. Oxygen is available at the leach titration hut, shift coordinators office, and unloading bay. Antidote kits are held at the first aid station and the kits will accompany the patient to the Hospital in Kalgoorlie, where trained medical staff will administer the necessary antidotes and apply medical treatment.
Oxygen first aid equipment is inspected monthly by emergency services dept. Masks, canisters and PPE are inspected by the Health and Safety department monthly. The INX system generates the action items for inspections to be done, to the EHS department. Inspection sheets were sampled for 2010 and 2012. The cyanide response kit audit includes the Cyano kit stored in the fridge at the Emergency Response Team site.
In-plant oxygen resuscitators and a number of St Johns first aiders are available on shift and they are trained to administer cyanide first aid and oxygen. All staff on shift are trained to administer oxygen. Emergency services are available outside the fence and are staffed with industrial paramedics trained to administer oxygen and cyanide antidote under medical consultation. Emergency Services transports patients, including the cyanide antidote kits, and medical protocol to nearby Silver Lake Medical centre where the doctors will administer the cyanide antidote kit in consultation with Kalgoorlie Regional Hospital. Doctors at Silver Lake will decide on further treatment which may include transport to Kalgoorlie Hospital by St Johns ambulance for further medical treatment. Cyanide equipment is regularly checked and tested and mock drills are held on site.

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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 7.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
A site Emergency Response Plan is in place, supported by an emergency and crises management plan, the CSBP transportation management plan, and emergency and crises management guidelines.
The emergency response plan is linked to specific emergency situations ("pips" 1 -5) and the appropriate procedures and responses within the site's systems. Offsite cyanide transportation emergencies will be handled using the CSBP Transportation Management Plan.

Standard of Practice 7.2: Involve site personnel and stakeholders in the planning process.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 7.2**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
No communities were involved in the ERP planning. The work force is made aware of the ERP during mock drills and their role is described as part of the induction. The ERT conducts mock drills. Local responders receive the AGR cyanide training package. A forum was held involving the Kambalda police, the local volunteer fire brigade, St Johns Ambulance Association, a local towing service and other local ER teams. Mutual aid arrangements are in place with adjoining mining companies.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 7.3**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Emergency Response Plan details clear duties, roles and responsibilities for site staff and Emergency Response Team for the various emergency scenarios. The site Coordinator is designated in the plan. The Plant Emergency Response Team is listed and an inventory of emergency response equipment is available. The Plan includes contact references (telephone, cell phone, etc) of internal and external resources for the various scenarios, particularly with detail where external resources and skills might be needed.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 7.4**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Emergency Response Plan includes details for appropriate emergency notification and reporting (internal and external) and the call-out procedure and contact information lists which are updated regularly. Internal and external communication (including the Media) is dealt with in the Plan.

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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 7.5**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Emergency Response Plan covers this in a section on post incident neutralization and decontamination. The use of treatment chemicals such as sodium hypochlorite, ferrous sulphate and hydrogen peroxide to treat cyanide that has been released into surface water is prohibited.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 7.6**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Emergency Response Plan is reviewed after an actual cyanide incident or after every mock drill. Mock drills are required to be conducted every six months.

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.

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Cyanide awareness is covered in a site specific induction (with 25 minutes dedicated to cyanide) for all staff working in cyanide areas. Full cyanide induction, based on AGR program, is given to all full time staff. A written assessment with a practical demonstration is given. All process personnel wear HCN gas detectors and are trained in the use, alarm functions, and calibration, of the detectors. Full cyanide induction and awareness refresher training is conducted every 2 years, backed up with annual assessments. All training records are retained for 75 years from the date of birth as per legal requirement. All current records retained on site. All obsolete records filed with personal records and filed centrally in Perth.

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.

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Training procedures are in place that cover the majority of tasks. Frontline training of operational and maintenance personnel is through their front line supervisor using the standard procedure. Sub matrix and procedure assessment forms are used. Task criticality rating is an on-going process. Training is also done against a national standard (Metaliferous Mining - processing – package) conforming to Australian QA/QF standards. A generic module is in place, with specific modules constructed for each individual area of the plant. Use and control of cyanide in the specific area is contained in a separate module for each circuit. No essential differentiation exists between reagent strength and lower strength cyanide in modules. Every procedure is reviewed and retrained, as appropriate, every 2 years. JHA (Job Hazard Assessment) training is conducted on demand. Upper level training is given by a competent qualified trainer. Lower level training is given by shift supervisors and the supervisors themselves receive basic supervisor training by external training organisations. The requirement is for task observations to be conducted at least 6 monthly by a random group of 12 -13 people and the results forwarded to plant management. All training records are retained for 75 years from the date of birth as per legal requirement. All current records retained on site. All obsolete records filed with personal records and filed centrally in Perth.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 8.3**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Specific procedures for handling cyanide releases have been written, and implemented. Training includes the basic induction module covering general cyanide awareness. Personnel working in cyanide areas receive the more advanced AGR-based training where more detail on cyanide first aid is given. All personnel are trained in the decontamination and first aid procedure, but are not required to use this as the ERT will respond and apply first aid. Qualified emergency team officers (trained in cyanide emergencies) are stationed at Emergency Services outside the plant. Cyanide specific mock drills are conducted. The current procedure is that the person identifying an incident must raise the alarm using either the radio channel 2, or telephone to raise the alarm with the emergency response staff in the emergency centre, where personnel with specialised first aid and emergency training are stationed. The incident, including evacuation, is controlled by the responsible person, usually the shift controller, on the plant (using the incident control, and adjoining mining companies). Mock drills are conducted to exercise response. The ERT is assessed by an external specialised emergency response company. Processing / engineering mock drills involves evaluation

by training personnel. All training records are retained for 75 years from the date of birth as per legal requirement. All current records retained on site. All obsolete records filed with personal records and filed centrally in Perth.

9. DIALOGUE: Engage in public consultation and disclosure.

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

X in full compliance with

The operation is

- □ in substantial compliance with **Standard of Practice 9.1**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
Dialogue meetings are two-way dialogue sessions involving both dissemination of information and the answering of questions on cyanide. Indirect opportunities exist in the form of a hotline linked to the head office in Perth. The local offices could also be contacted. Renewal of licences are advertised in the newspapers and the stakeholders have 2 weeks to respond. The website can be used to contact operations. The small local community makes access to management easier. Telephone numbers are displayed on the cyanide management poster which is displayed publically.
The site will attend the bi-monthly Coolgardie Shire meetings. Opportunities are given to the attendees to communicate any cyanide or other issues to the St Ives Gold Mine representative. The site location is some distance away from the communities with a large part of the community working at the operations and thus have access to information and communication channels.
Public, School and Family days are held for St Ives Gold Mine which include visits to Lefroy Mill.

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

X in full compliance with

The operation is

- □ in substantial compliance with **Standard of Practice 9.2**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
Dialogue meetings are two-way dialogue sessions involving both dissemination of information and the answering of questions on cyanide. Indirect opportunities exist in the form of a hotline linked to the head office in Perth. The local offices could also be

contacted. Renewal of licences are advertised in the newspapers and the stakeholders have 2 weeks to respond. The website can be used to contact operations. The small local community makes access to management easier. Telephone numbers are displayed on the cyanide management poster which is displayed publically.
The site will attend the bi-monthly Coolgardie Shire meetings. Opportunities are given to the attendees to communicate any cyanide or other issues to the St Ives Gold Mine representative. The site location is some distance away from the communities with a large part of the community working at the operations and thus have access to information and communication channels.
Public, School and Family days are held for St Ives Gold Mine which include visits to Lefroy Mill.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 9.3**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The site has developed a large colour poster on cyanide management at St Ives Gold Mine which is posted and circulated in public places. This material is readily accessible as illiteracy levels in the area are insignificant.
All lost time injuries are reported to the resource safety section of the Department of Consumer and Employment Protection of the Government of Western Australia in terms of section 76, 78, 79 of the Mines Safety Inspection Act of 94. No cyanide incidents occurred since signing on to the ICMI. Environmental incidents are categorised and responded to, depended upon the classification. **Level 1:** No or negligible adverse environmental impact. **Level 2:** Short Term, limited and non-ongoing adverse environmental impacts, **Level 3:** Ongoing but limited environmental impact, **Level 4:** Medium term environmental impact, **Level 5:** Long term environmental impact. All level 2 or greater must be externally reported to DEC and the DoIR (Department of Industry and Resources) within 24 hours of the incident occurring. Levels are also determined by using the volumes of the spill. All reports to departments are publically available for information on request.