

# SUMMARY AUDIT REPORT

for the May 2016  
International Cyanide Management Code Recertification Audit



**Prepared for:**

Kinross Gold Corporation  
Chirano Gold Mining Ltd.

**Submitted to:**

International Cyanide Management Institute  
1400 "I" Street NW, Suite 550  
Washington, D.C. 20005

**FINAL**

15 November 2016



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## DETAILED AUDIT FINDINGS REPORT

**Name of Mine:** Chirano Mine

**Name of Mine Owner:** Kinross Gold Corporation

**Name of Mine Operator:** Chirano Gold Mines Ltd. (CGML)

**Name of Responsible Manager:** Ken Norris, Vice President/General Manager

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### **Location detail and description of operation:**

Kinross Gold (Kinross) acquired its ownership stake in the Chirano mine in 2010 as part of the acquisition of Red Back Mining, Inc. The mine is located in southwestern Ghana, approximately 100 kilometres southwest of the city of Kumasi. The mine lies within the Bibiani gold belt, and consists of several conventional open pit mining sites as well as underground workings. Ore is transported to a centrally-located processing plant, where it is crushed and milled before undergoing conventional carbon in leach (CIL) processing. CGML operates two tailings storage facilities (TSF). Tailings were deposited in TSF-1 until commissioning of TSF-2 in 2013. Thereafter tailings were primarily deposited in TSF-2 and TSF-1 was no longer used for regular tailings deposition. Due to the perceived risk of TSF-2 to Akoti and Etwebo communities located downstream of TSF-2 CGML is forgoing the construction of TSF-1 Stage 7 and TSF-2 Stage 6. This results in reducing the original design capacities of TSF-1 and TSF-2. CGML is in the process of designing and permitting two additional tailings facilities (TSF1-North Extension and TSF-1-South Extension) to provide an addition tailings storage capacity needed to allow operation into 2017.

Cyanide facilities include a warehouse for storage of cyanide reagent in solid briquette form, a cyanide mixing and storage facility, the CIL processing circuit, a clarifier and tailings box, a lined Event Pond, tailings and reclaim water return pipelines, a pipeline spill collection pond, the two TSFs, reclaim water settling and management ponds, and various other process water control features and connecting pipelines.

The general location of the Chirano mining operation is shown on the following figure:



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### *Auditors' Finding*

**The operation is:**           in full compliance  
                                  ■ in substantial compliance  
                                  not in compliance

with the *International Cyanide Management Code*.

CGML has experienced no significant ICMC compliance issues and has only used ICMC certified cyanide suppliers and transporters since the previous audit. The Corrective Action Plan (CAP) to bring the operation noted to be in substantial compliance into full compliance is attached (Attachment A) with this Summary Audit Report. The CAP must be fully implemented within one year of the date of this audit.

**Audit Company:**           Ramboll Environ  
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John Lambert  
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**Date(s) of Audit:** 23<sup>rd</sup> to 29<sup>th</sup> May 2016

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 Detailed Audit Findings 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.

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**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.**

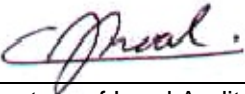
The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 1.1

### ***Discuss the basis for this Finding/Deficiencies Identified:***

Chirano Gold Mine Limited (CGML) currently purchases sodium cyanide solely from Cyanco Corporation LLC based in Pearland Texas (Cyanco) under the conditions of a Sodium Cyanide Contract. Cyanco's solid cyanide facility in Alvin Texas, which supplies sodium cyanide to CGML, is certified to the cyanide code. Sodium Cyanide was previously purchased from Orica Australia Pty Ltd up until January 2013 when the first consignment was received from Cyanco. The current contract expires on December 31, 2017.

The current Sodium Cyanide Contract General Condition Clause 5 specifically requires that both parties are to remain signatories to the ICMC and that certification is maintained as current. Clause 5.3 also requires that Cyanco is compliant with all ICMC production and transportation requirements. Cyanco's current Code certification is valid and was verified by review of the ICMI website (<http://www.cyanidecode.org/signatory-company/cyanco>).

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**2. TRANSPORTATION Protect communities and the environment during cyanide transport.**

***Standards 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.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 2.1.

***Discuss the basis for the Finding/Deficiencies Identified:***

The Cyanco Sodium Cyanide Contract places the responsibility for items 2.1(a) to 2.1(l) including packaging, labelling transport, storage and deliveries with Cyanco. The exception is 2.1(h) where unloading at the mine is the responsibility of CGML.

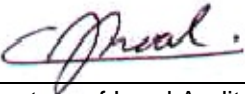
A review of the ICMI website (<http://www.cyanidecode.org/signatory-company/cyanco-corporation>) verifies that Cyanco's transportation supply chain is certified including the Global Ocean Supply Chain for road transportation from Cyanco's Houston production facility to the Port of Houston and departure from the Port of Houston to Ghanaian ports of Tema and Takoradi.

Vehrad Transport and Haulage Limited (Vehrad) is Cyanco's transportation agent responsible for road transport of sodium cyanide from the Port of Tema to CGML. Review of the ICMI website verifies that Vehrad is certified to transport cyanide from the Port of Tema (<http://www.cyanidecode.org/signatory-company/vehrad-transport-haulage-limited>).

The Sodium Cyanide Contract requires that the products are properly labelled in accordance with the ICMC and contain accurate information with respect to use, safety and treatment of products, and that the supplier is responsible for interim storage in compliance with the ICMC.

Road transportation routes from Tema Port to CGML are evaluated by Vehrad on Route Risk Assessments and a Route Plan developed in consideration of population densities, road conditions, vehicle density, water crossings, intersections, water bodies and route curves and inclines. Vehrad has developed an Emergency Response Plan (VERP) in the event of a cyanide emergency during transportation. The VERP considers scenarios such as truck breakdown, cyanide releases, fire, driver incapacitation and security risks.

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The Sodium Cyanide Contract requires that Cyanco assume responsibility for all aspects of the product supply chain and that ICMC requirements will extend to transporters and subcontractors.

**2.2 Require that cyanide transporters implement appropriate emergency response plans and capabilities, and employ adequate measures for cyanide management.**

The operation is:   ■ in full compliance  
                          in substantial compliance  
                          not in compliance...with Standard of Practice 2.2.

***Discuss the basis for the Finding/Deficiencies Identified:***

The Sodium Cyanide Contract places responsibility for the supply and transportation of cyanide with Cyanco and that the requirements, including certification, production and transportation meet the ICMC.

Cyanco's supply chain is currently certified to the Code from the production facility in Houston to the ports of Tema and Takoradi in Ghana. Cyanco has confirmed that Action Resources Inc., Quality Carriers Inc. and Transwood Inc. (all certified) are used as the transporters from the Houston Production plant to the Houston Port. Ocean carriers Hamburg Sued, Maersk, Hapag Lloyd, Mediterranean Shipping Co. (MSC), CMA CGM, Compania Sud Americana de Vapores (CSAV) and Zim Lines are included in the supply chain to Ghana.

Samples of bills of lading were examined for 2016 and confirm the supply chain uses transporters certified to the Code. Records confirm that Cyanide is sourced from the certified Cyanco production facility in Houston, Texas and is transported to Tema Port in Ghana using Cyanco's certified Global Ocean Supply Chain. Road transport is undertaken solely with Vehrad who are also Code certified.

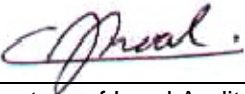
**3. HANDLING AND STORAGE Protect workers and the environment during cyanide handling and storage.**

***Standards of Practice***

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

The operation is:   ■ in full compliance  
                          in substantial compliance  
                          not in compliance...with Standard of Practice 3.1.

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

The cyanide warehouse has not changed since the initial verification audit except sheaving was added on the sidewalls to prevent precipitation contacting the stored IBC boxes. The warehouse is located within the security perimeter of the warehousing area, which in turn is well within the security perimeter of the mill/process plant site. The cyanide mixing and storage tanks are located within a bunded concrete impoundment adjacent to the CIL plant; there are no surface waters within 500 meters. The concrete containment was examined and found to be well maintained and competent to prevent seepage to the subsurface. The cyanide mixing and storage tanks are both fitted with high-level alarms and a permanently plumbed overflow pipe reporting to the containment. Tank levels are remotely monitored from an enclosed operational control centre located on the upper deck of the CIL area. The level of the mix tank can also be checked by the operators on a high-level console located on the upper deck of the mix plant.

**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.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 3.2.

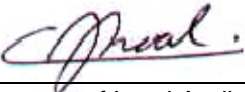
***Discuss the basis for this Finding/Deficiencies Identified:***

Cyanide is unloaded by crane within the security perimeter of the warehouse yard and stored in a dedicated and locked area of the warehouse. Containers are opened, and after an atmosphere check for potential hydrogen cyanide gas (HCN) are unloaded and the Intermodal Bulk Containers (IBC) boxes moved to a dedicated storage bay at the north end of a roofed, open-front concrete-floored warehouse. CGML procedure is to never stack the boxes more than three high.

During a cyanide mix bags are rinsed in the cyanide hopper immediately after the bag is split and the cyanide briquettes dispensed, and prior to retrieval of the bag from the hopper. The bags are triple rinsed using dedicated spray nozzles located on the bag splitter inside the enclosed hopper enclosure above the mix tank. The empty cyanide packaging materials are collected and stored in a warehouse bay adjacent to the cyanide storage area. The packaging is loaded into an empty shipping container available after a cyanide delivery and sent back to the cyanide vendor for disposal. No packaging materials are directly disposed of by CGML.

Procedures are in place to prevent exposures and releases during cyanide unloading and mixing activities. These procedures require a team of two in full Personal Protection

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Equipment (PPE). Pre-inspections are undertaken to check showers and equipment are functioning, and the areas are cordoned off to prevent unauthorized access during a cyanide delivery or mix operation. The shipping container is vented after opening and checked for HCN gas prior to unloading. The pH is maintained above 10.5 during a mix to prevent the generation and release of HCN gas. After each mix the mix plant is washed down to remove any residual cyanide that may have been released during a mix.

During a mix the auditors observed that the curtains on the mix hopper were not closing after a bag was hoisted into the hopper, creating a risk of cyanide dust release or solution contacting the operator during the bag rinse process. Prior to submission of this report CGML replaced the curtains with rigid doors and modified the mix procedure to ensure that the doors were closed after the bag was hoisted into the hopper enclosure to prevent potential release of cyanide.

**4. OPERATIONS Manage cyanide process solutions and waste streams to protect human health and the environment.**

***Standards of Practice***

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

The operation is:                      in full compliance  
  ■ in substantial compliance  
  not in compliance...with Standard of Practice 4.1.

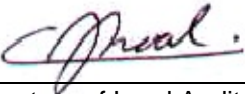
***Discuss the basis for the Finding/Deficiencies Identified:***

The Standard Operating Procedures (SOPs) and operating manuals are in place to manage CGML's cyanide operations which consist of the following:

- the cyanide receiving area and warehouse;
- cyanide mixing facility, with mixing and solution storage tanks;
- the CIL circuit (leach tank, nine adsorption tanks, and the desorption circuit);
- the Event Pond
- tailings and reclaim water pipeline, with associated pumping stations;
- tailings pipeline leak collection pond;
- TSF-1 and TSF-2;
- the Decant Water (settling) Pond; and
- associated piping systems and other infrastructure.

CGML does not use heap leaching, mineral separation, cyanide regeneration, or cyanide detoxification processes. With respect to the latter, CGML relies on dilution methods using raw

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water and decant/reclaim water to achieve residual cyanide concentrations in the tailings stream that permit maintenance of residual cyanide concentrations in the TSFs within the 50 mg/L WAD cyanide permitted in open ponds by the Code under standard of practice 4.4.

The process water used in the mill is a mixture of decant water from the TSF and overflow from the pre-leach thickener. The cyanide concentration in this process water has been maintained consistently in the general range of 0.005 to 0.01 mg/L, i.e., well below 0.5 mg/L WAD over the past three years, except during February and March 2016 when concentrations were 16.6 mg/L and 6.5 mg/L WAD, respectively, returning to 0.008 mg/L in April 2016. CGML was requested to conduct a root-cause analysis to determine the reason for the elevated concentrations and develop measures to ensure that process water remains below the 0.5 WAD threshold for a cyanide facility.

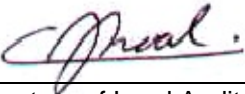
Subsequent to the field component of the audit CGML conducted a root cause analysis and determined that the elevated levels in the thickener resulted from the need to return slurry (loaded carbon and slurry from the mill) from the event pond back into the process. Such upsets to the event pond are infrequent and are the result of occasional national power issues and operational upsets. Based on the results of the analysis CGML implemented a procedure to determine how and when slurry in the event pond may be pumped back to the process and to monitor process water and thickener overflow to ensure that process water in the mill does not exceed the threshold value of 0.5 mg/L. Results of daily analysis of thickener overflow and process water for June and early July showed WAD cyanide concentrations of between 1.7 and 4.6 mg/L. Since 13 July WAD cyanide concentrations in the thickener have been consistently below 0.5 mg/L while the process water has varied between 0.3 mg/L and 1.3 mg/L.

CGML realized that the decant/reclaim water does not mix well with the thickener overflow in the ponds before sampling was being done and this may explain the elevated readings still being found. To obtain a truer representation of the WAD cyanide levels in the mill CGML initiated a sampling program of the mill slurry. A preliminary result of a sample collected on 2 August showed that WAD cyanide concentration in the mill was below the WAD cyanide threshold for a cyanide facility of 0.5 mg/L. To be fully compliant with this requirement of the Code CGML needs to provide evidence to demonstrate that WAD cyanide concentrations in the mill are consistency maintained below 0.5 mg/L. See CAR CGML-ICMC-01.

TSF-1 and TSF-2 were both designed by Knight Piésold (Ghana). CGML has maintained detailed design and construction reports for each phase of TSF construction. Design and operating requirements for facilities are described in the operating manuals developed by Knight Piésold. These manuals contain specific directions on monitoring freeboard, and these are reflected in daily inspection checklists used for TSF-1 and TSF-2.

The process plant was originally designed by Lycopodium Minerals QLD Pty, Ltd., Australia (Lycopodium) and underwent a major redesign in 2008-2009. Commissioning of the updated

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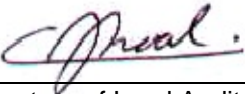
process plant was conducted on an operable system basis, and key assumptions and design parameters were documented in each final operable system commissioning inspection packages and are reflected in the operation of commissioned systems.

Procedures are in place to manage the delivery, storage and handling of cyanide and operation of its cyanide facilities in a safe and environmentally sound manner. These procedures include scheduled and documented inspections; preventative maintenance of equipment; as well as monitoring of process parameters, solution flows and pond elevations. Procedures also include requirements for PPE and pre-work inspections. In addition there are requirements job hazard assessment and work permits for non-routine work tasks. CGML also monitors and manages the water balance to ensure safe operation of the TSFs.

A management of change procedure is in place to manage operational or facility changes. The procedure applies to the management of both temporary and permanent changes and covers any changes to equipment, software, procedures or processes that may introduce hazards to health, safety and/or environment, or effect the operational efficiency of the mine. CGML has used the procedure for several changes involving cyanide facilities over the past three years; however, review of records found that the written procedure was not being followed adhered to (i.e., change management numbers were not being obtained and documentation was not being consistently filed as required by the procedure). Prior to submission of this report CGML reviewed the implementation practices, modified the *Change Management Procedure* and retrained staff and management in the revised procedure to ensure that management of change documentation is uniformly tracked and filed.

Based on review of inspections records covering the past three years, discussion with site personnel, and observations made of the operating condition of the cyanide facilities during the site visit, it is the auditors opinion that these inspections are conducted at frequencies sufficient to ensure that the facilities are functioning within design parameters. CGML conducts routine facility inspections of the mixing and storage area, the CIL, tailings box, and thickeners areas; the Event Pond; the tailings and reclaim water pipelines; TSF-1 and TSF-2, as well as the Raw Water Pond/Decant Water Pond and their associated settling basins. CGML retains completed inspection records. A review of records covering the past three years revealed that the inspections have general been completed as scheduled and the forms filled as required with the inspector's name and date, results of the observations made for each item listed, and inclusion of notes on any required actions. Inspection records were also being reviewed and signed by a supervisor. An exception to full form completion was noted on the *TSF-2 Inspection Log Sheet* records for 2015. Spigot use information had not recorded after February 2015. CGML discovered the deficiency in January 2016 and occurred as a result of an older inspection sheet being mistakenly revived. The error was corrected in January 2016 with reintroduction of the correct inspection sheet and spigot information has been documented since.

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The TSFs operating manuals address procedures to be implemented in the event of an upset resulting from a power failure, earthquake event, excessive seepage, extreme rainfall event, or overtopping. The TSFs are operated in line with the International Commission of Large Dams (ICOLD) guidelines which includes quarterly inspections by a qualified and experienced geotechnical engineer to ensure that they are operated in a safe and efficient manner. These quarterly inspections are undertaken by Glocal Engineering Limited (Glocal). No potential safety concerns requiring immediate actions were identified by Glocal. Identified deficiencies and recommendations made by Glocal are addressed by CGML in a timely manner.

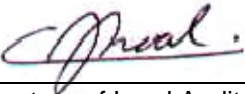
Short and medium term process plant closure is addressed in a guidance procedure that address situations where closures are long enough to significantly alter ability of the plant to continue routine activities. The procedure identifies those processes that will be need to be maintained during a short term closure, including regulatory obligations, security, process piping and pumps, secondary containment, tailings and facility inspections and hazardous materials management. The procedure requires that the integrity of the entire process system is evaluated prior to restart up and those portions of the process that had been drained, visually inspected for leaks when recharged with process solution. If the temporary closure period exceeds 90 days, or if site anticipates that it will exceed 90 days, site will begin to evaluate procedures to carry out permanent closure.

Since 2013 CGML has tracked Preventive Maintenance (PM) using J.D. Edwards software. Maintenance prior to this time was tracked using Mainpac and these records have been archived for historical purposes.

The J.D. Edwards system contains routine planned PM actions for all major systems involving management of cyanide; work orders are automatically generated to guide specific PM actions by maintenance staff. In addition, work orders are also generated in response to operational performance issues or inspection issues; the requested action is vetted by the maintenance planner in discussion with the originator or the originator's supervisor and acted on accordingly. J.D. Edwards is also used to schedule and track inspections and maintenance of cyanide tanks. Each tank is scheduled for annual inspection and ultra-sonic wall thickness testing. Nobil Engineering Ventures are retained to conduct the testing and certification of the tanks. Records were reviewed for inspections undertaken in 2012, 2014 and 2015.

CGML operates on grid power, but maintains eight 2250 kva backup diesel generators capable of provided emergency power for all critical cyanide management functions. Two of these are new generators purchased since the initial verification audit. The generator sets are inspected daily and are maintained by electrical and mechanical technicians on a weekly, monthly and quarterly schedule.

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

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 4.2.

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

The consumption of cyanide ore is minimized by blending the ore from the pits to reduce the variability in the ore going to the process plant. Based on a recent study supported through the Continuous Improvement (CI) Department, CGMC has implemented an initiative to reduce the use of cyanide. The study found that the level of cyanide dosing at the leach tank could be reduced from an excess of 200 ppm (being applied during the initial audit) to 125 ppm without a significant impact on gold recovery. Implementation of this initiative has led to a reduction in cyanide use from 174 to 149 grams/tonne based on the prevailing nature of the ore.

Cyanide addition rates are closely monitored using a manual titration process, conducted on samples collected by mill personnel every 2 hrs from slurry in the Pre-Leach Tank (TK1) and last CIL Tank TK9. In addition samples are collected for titration analysis from the Leach Tank and each of the CIL tanks (TK2 through TK9) at the start and end of each 12 hr shift. The cyanide addition rate to the Leach Tank is adjusted manually to maintain the cyanide concentration within an optimal target of 120 to 140 ppm, resulting in a residual concentration in Tank TK9 of between 50 and 70 ppm, thus minimizing the quantity of cyanide being discharged in the tails.

Tails from the CIL circuit are directed to the tailings hopper. The tails are diluted with reclaim water from the TSFs prior to discharge to the TSFs.

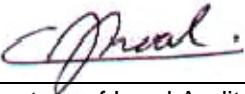
**4.3 Implement a comprehensive water management program to protect against unintentional releases.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 4.3.

***Discuss the basis for the Finding/Deficiencies Identified:***

Knight Piésold has been retained by CGML to develop and manage the water balance. The model was updated in January 2014 to account for changes to the TSF-2 catchment area. The model takes into account the permit requirement to maintain a 2 m freeboard (pond to embankment crest). The 2 m freeboard is based on maintaining sufficient capacity within the

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TSF to retain an Inflow Flood Design (IDF) of precipitation from a 1:1,000 year 24 hr storm event plus 1/3 of a difference between the 1:1,000 year storm and the Probable Maximum Flood (PMF) while maintaining a 1.0 m freeboard below the crest or 0.5 m below the spillway invert. The design storm event is modelled using a rainfall distribution that is characteristic of severe storms in tropical/equatorial regions. The model covers the period of operation of TSF2 from January 2014 to mid-2016 at which time the TSF will have reached its full tailings capacity.

The water balance model considers actual and predicted deposition rates, and can be modified for actual throughput to date on a monthly basis or whenever considered necessary. The monthly climatic data used in the model are based on annual records from the Sefwi Bekwai weather station (about 12 km south of the mine site) dating between 1970 and 1996; and since 1996, weather data from a weather station located on the mine site. The model takes into account all catchment areas, varying degrees of infiltration within the catchment, potential seepage losses, reclaim water use, and losses from evaporation. No solution is discharged from the TSF.

Documented inspection and monitoring procedures are in place for process ponds and the tailings facilities. CGML conducts daily inspections of TSF-1, TSF-2, the tailings pipelines and the emergency pond for the tailing pipeline. Monthly inspections are conducted of the process and settling ponds. Inspection records were available for the past three years. These inspections include monitoring pond elevations to ensure adequate freeboard is maintained to prevent overtopping. Beach elevations are recorded on a weekly schedule using gauge posts positioned around the tailings impoundment. These measurements are supplemented by beach surveys that are conducted two or three times a year. This information, as well as weekly piezometers readings, and monthly process plant throughput, tailings discharge and water intake data, are provided to Knight Piésold for updating the water balance.

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


The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 4.4.

***Discuss the basis for the Finding/Deficiencies Identified:***

TSF-1, TSF-2, the Decant Pond, and the Event Pond are the only facilities where open solutions are stored or retained for any length of time.

Except for a few months in 2014 no tailings have been discharged into TSF-1 in the last three years; tailing are primarily deposited in TSF-2. The surface water accumulating in TSF-1 is therefore mostly from precipitation and WAD cyanide concentrations are very low and well

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below the 50 mg/L limit for protection of wildlife. Records of monthly sampling and analysis of reclaim water from the TSF-2 supernatant pond show WAD cyanide concentrations between <0.05 mg/L and 0.9 mg/L, with the majority of analysis results being at the lower end of this range.

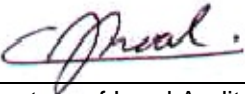
Cyanide concentrations are monitored every 2 hrs in CIL tank TK9. These concentrations are representative of the slurry going to the tails box and are generally in the range of 60 to 70 mg/L free cyanide. CGML does not have a cyanide destruct plant but adds water to the tails box to reduce cyanide concentrations discharged to the TSF. Up until November 2012 CGML was analysing tailings at the spigots of TSF-2 to verify WAD cyanide concentrations discharges flowing across the beaches. An analysis was undertaken in May 2013 and then sampling and analysis at the spigots was not resumed until March 2016. Of the limited data available between March 2012 and April 2016, only one result (50.8 mg/L) exceeded 50 mg/L WAD; the average concentration was 29.4 mg/L. Although data available for WAD cyanide concentrations at the spigot discharge suggests that discharge solution flowing across the tailings facility beaches has generally been less than 50 mg/L, insufficient data is available to demonstrate that this has been maintained over the three year period. As a result CGML was requested to re-implement regular monitoring of WAD cyanide in spigot discharge. Results of analysis for the period April 2016 through end of July 2016 showed that spigot discharge values were generally being maintained within the range 25 and 40 mg/L and that the procedures in place enable the discharges across the tailings beaches to be maintained below 50 mg/L.

Decant water from TSF-2 and thickener overflow is received in the Settling Pond. The overflow from the Settling Pond is directed either to Process Water Pond 1 or Process Water Pond 2. Neither the thickener overflow nor the decant water going to the Settling Pond contain significant concentrations of cyanide, therefore WAD cyanide concentrations are also negligible in the process ponds.

The Event Pond is used for emergencies and routinely for temporary storage of solutions during maintenance operations. Although there is a potential for WAD cyanide concentrations in the Event Pond to be periodically greater than 50 mg/L, a procedure is in place to monitor this pond and ensure that solutions and sediment are removed within 7 days if WAD cyanide concentration exceed 50 mg/L. Weekly inspection records were available for the past three years show conformance to this procedure.

Daily inspections conducted of TSF-1 and TSF-2 include monitoring for the presence of animal and bird mortalities and observations are included on the inspection sheets. No mortalities have been reported in the past three years. During the inspection of the TSFs, the auditors observed several species of birds in the vicinity of the TSFs. None appeared to be in anyway negatively impacted by the pond water.

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Fencing has been placed to restrict access by domestic animals from nearby villages, and signage has also been provided to alert herders; these methods have reportedly been effective in preventing mortalities to domestic animals.

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

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 4.5.

***Discuss the basis for the Finding/Deficiencies Identified:***

The operation functions as a closed circuit with zero discharge to surface water. The Reclaim and Event ponds are constructed with HDPE liner and the TSF embankment dams are designed with a silty clay core and cutoff trench and operated to minimize the height of the phreatic surface within the dam. Underdrains have been placed within the TSF base to promote drainage and consolidation of the tailings. These underdrains flow to a collection tower and fluid draining from the tails is pumped back to the supernatant pond.

There is no indirect seepage from cyanide facilities and surface waters have not been impacted by cyanide at concentrations above the numerical regulatory standard for protection of the beneficial use of aquatic wildlife. This is based on the sample analysis data collected since 2011 from the five monitoring wells, as well as from analysis of surface water collected in the Suraw River immediately downstream of the tailings facility. Analytical results for these samples were all below the detection limit (<0.01 mg/L) for total, free and WAD cyanide.

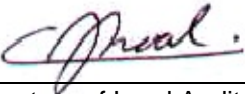
**4.6 Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of ground water.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 4.6.

***Discuss the basis for the Finding/Deficiencies Identified:***

There are currently no regulatory standards in Ghana for the protection of groundwater. Groundwater is used by nearby villages for a potable water supply therefore CGML uses the Ghanaian Water Quality Standard of 0.01 mg/L free cyanide for protection of the drinking water supply. Groundwater monitoring wells are sampled monthly for water quality analysis. Review of data since the 2012 shows that free cyanide has been less than the detection limit of 0.01 mg/L in groundwater monitoring wells located downgradient of the process plant and

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TSFs. CGML also monitors water quality in potable water wells located in the villages of Akoti and Ekyiabo. Cyanide has never been detected in these wells.

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

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 4.7.

***Discuss the basis for the Finding/Deficiencies Identified:***

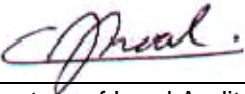
The cyanide mix, storage, Leach Tank and CIL tanks are all constructed within a bunded concrete containment. Additional containment capacity is provided by a permanently connected Event Pond. At the time of the 2013 certification audit it was discovered that the containment provided for the Leach/CIL tanks was not sufficient to retain 110% of the largest tank within the containment bund and event pond. Subsequent to the audit CGML designed and installed a system whereby the existing Event Pond (a.k.a. Event Pond #1), a downgradient Tailings Pipeline Event Pond (a.k.a. Event Pond #2), and a welded HDPE-lined Tailings Pipeline Channel interconnecting the two ponds combination to provide emergency containment well in excess of the ICMC containment capacity requirement in the event of a catastrophic failure of a tank within the CIL bund.

The CIL tanks are constructed on ring-beam foundations. These tanks are each equipped with piezometer leak detection systems that are monitored weekly for potential leakage. CGML also retains a contractor to perform annual inspection and ultrasonic testing of each tank to monitor tank integrity.

Shift inspections are undertaken daily to ensure containment integrity for the mix, storage, leach tank and CIL tanks is maintained. Daily inspections are also undertaken of ponds and tailings pipelines to check integrity of liners and ensure ponds are operated within design parameters. Sump pumps are on a weekly preventative inspection and maintenance program. In the event of upsets in the process plant, solution /sediment is directed to Event pond #1. Weekly inspection and maintenance are in place to ensure the pond capacity is maintained. In the event of a major spill from a tank rupture the spill would be contained within Event Pond #1 and any excess would be directed via a sluice gate located near the leach tank to flow down-gradient along a lined channel to the tailings line containment and into Event Pond #2.

All cyanide solution pipelines within the process plant are located above ground and within the containment bund or provided with dedicated containment. Since the 2012 ICMC audit CGML has installed HDPE liner to provide secondary containment along the tailings pipeline/reclaim pipeline trench. Event Pond #2 is also lined and provides containment capacity in the event of a large pipeline failure or major failure of a CIL tank. During the field component of the audit

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a section (approximately 70 m) of tailings pipeline located between the process plant and the tailings containment channel was not provided with containment. In the event that this section of the pipeline failed, tailings solution would potentially flow downhill and possibly enter the environment via a stormwater drainage system located down gradient of the pipeline. Prior to preparation of this report CGML completed construction of a concrete basin beneath this section of pipeline to provide containment for this section of the tailings line. In addition to containment measures, CGML conducts daily inspections of the tailings pipeline and well as annual non-destructive testing of the pipeline.

It is understood that after the accidental tailings pipeline breach and spill that occurred in 2008, CGML channelized a portion of the Suraw River near the toe of TSF-1 (the Suraw River being be a low-flow waterway except in the rainy seasons) and installed a series of large-diameter knife gates to permit the rapid isolation of any potential future tailings pipeline spills before they can impact downstream residents. A special procedure was created to guide general spill response actions as well as the specific closure of the knife gates in the lined river channel. Apart from this specific area of the Suraw River, there are no areas in which the tailings or reclaim water pipelines present a significant risk to surface water. All other process solution pipelines are either within containment or are readily accessible for inspections for potential solution leaks

Cyanide mixing, storage and process solution tanks are all constructed of carbon steel; process pipelines are typically constructed of carbon steel or HDPE; the tailings and reclaim pipelines are constructed of HDPE.

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

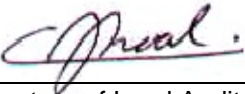
The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 4.8.

***Describe the basis for the Finding/Deficiencies Identified:***

QA/QC assurance procedures have been implemented during construction of all new facilities and modifications to existing facilities. Where QA/QC records were not available CGML has retained a qualified person to complete an engineering inspection of the facility.

The process plant was originally designed by Lycopodium Minerals QLD Pty, Ltd., Australia (Lycopodium). The plant underwent a major overhaul in 2008-2009 that touched virtually every component; these changes were also designed by Lycopodium. Commissioning of the updated process plant was conducted on an operable system basis, and quality control and quality assurance (QA/QC) manager approvals were typically included with each operable

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system as-built approval package. TSF 1 and TSF 2 were both designed by Knight Piésold (Ghana) and were supported by detailed design reports for each phase of construction, as well as by construction reports that documented acceptance of the as-built facilities by the Knight Piésold design engineer. At the time of the 2012 ICMC certification audit detailed engineering design documentation were reviewed for the process plant as well as TSF-1 and TSF-2 construction completed as of the date of that audit. The retention of this documentation at the facility was checked and is currently stored in CGML's library at the process plant.

During the 2012 verification no QA/QC records were available for construction of the Event Pond, Decant Water Pond and associated sedimentation ponds, pumps and connecting pipelines; the tailings and reclaim water return pipelines, and the tailings pipeline spill containment pond. Subsequent to that audit these facilities were inspected by a qualified engineer who prepared a report concluded that their continued operation within established parameters would be protective against cyanide exposures and releases.

New tailings facility construction in the last three years has included Stage 2, 3, 4 and 5 dam raises for TSF-2. Signed as-built and QA/QC records for construction of Stage 2, 3 and 4 were available for review and are maintained as PDF files on CGML's computer storage. At the time of preparation of this report Knight Piésold was in the process of finalizing the Stage 5 Raise Construction Report.

Other construction works completed since the 2012 ICMC verification report include emergency containment measures for the CIL plant and installation of containment for the tailings pipeline. Engineering design reports for these structures were completed by Golder Associates. QA/QC records and construction sign-off was provided in a report by Knight Piésold, the QA/QC engineer for these works. The report maintained as PDF files on CGML's computer storage.

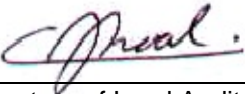
**4.9 Implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and ground water quality.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 4.9.

*Describe the basis for the Finding/Deficiencies Identified:*

Monitoring is conducted at frequencies adequate to characterize surface water, groundwater quality, and wildlife mortalities. Detailed written surface water and groundwater sampling plan is in place and was last updated in 2015. The plan also addresses avian and terrestrial wildlife monitoring. The plan was developed by qualified and experienced Environmental Department staff under the direction of the Environmental Manager. The EMP sets out the surface and groundwater monitoring program for sampling stations designated in accordance

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with the EPA Environmental Rating Methodology for Mining Companies (AKOBEN 2008). The monitoring program includes points of compliance, surveillance monitoring and control reference points; operational points within the mine take area and upgradient of compliance points, and points of beneficial use (e.g., potable water supplies). The Plan shows the locations of sampling points on a site plan and summarizes the sampling frequencies and parameters to be monitored on a table. The Plan also provides procedures on entries into field log books and onto sample collection forms; chain-of-custody protocol; sampling naming convention; field measurement and observation; sampling methods; sample preservation, labeling and shipment; and analytical methods.

Wildlife monitoring is integrated into the shift inspections performed at the Event Pond and TSFs. Wildlife observances and mortalities are documented on the inspection log sheets for each of these facilities. Procedure requires that any mortality is reported to the Environmental Superintendent and Process Plant Manager. If mortality is suspected to be associated with cyanide a tissue analysis would be undertaken. All mortalities are reported to EPA. To date there have been no reported cyanide related wildlife mortalities.

Surface water and groundwater monitoring is reported to EPA as part of permit requirements and environmental performance is published annually by Ghana EPA as part of the AKOBEN program. Review of CGML's annually AKOBEN Reports for the past three years shows that the Chirano Mine has scored high ratings for environmental monitoring and compliance with environmental quality standards.

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

***Standards of Practice***

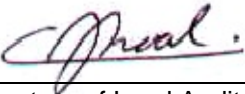
**5.1 Plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of 5.1.

***Describe the basis for the Finding/Deficiencies Identified:***

CGML has prepared a comprehensive Cyanide Decommissioning/Closure and Post-Closure Land-Use Plan. The plan is a revision-controlled document that is reviewed every two years, and in its current iteration (January 2015) presents conceptual procedures for closing all cyanide management facilities, as well as a framework for planning and developing conceptual procedures into specific closure task work assignments prior to shut down. The plan requires appropriate updates of HSE training closure procedures, and emergency response procedures

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three months prior to shutdown, in order to accommodate specific decommissioning task activities. The *Plan* also requires a number of discrete actions in advance of closure to ensure that planning and procedures are appropriate for the actual configuration of cyanide management facilities at the time of closure. Conceptual procedures are to be updated and more fully developed into series of discrete work-controlling tasks at least 3 months prior to shut down. In addition, the Plan includes a decommissioning cost estimate that considers the most current conceptualization of anticipated decommissioning and closure procedures and copies of the financial guarantee required by the Ghanaian Environmental Protection Agency (EPA); the latter must be updated annually and must reflect any anticipated changes to the decommissioning and closure approach.

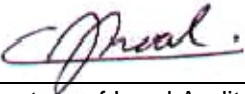
**5.2 Establish an assurance mechanism capable of fully funding cyanide-related decommissioning activities.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 5.2.

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

CGML is required by the Ghanaian Environmental Protection Agency (EPA) to provide a financial guarantee and the guarantee is annually reviewed and updated. A decommissioning cost estimate for all CGML facilities (including cyanide management infrastructure) that project third-party costs (based on standard estimate references and unit rates) for progressive rehabilitation, pre-closure, and post-closure phases of the project has been developed and was last update in December 2014. The 2014 cost estimate was incorporated into the 2015 revision of the Cyanide Decommissioning/Closure and Post-Closure Land-Use Plan which was submitted to EPA in support of the 2016 financial guarantee review and approval process. The financial guarantee for the mine rehabilitation and closure (2014) is US \$27.42 million; substantially in excess of the US \$2 million estimate to close CGML's cyanide-related infrastructure, to the extent specified by the Code

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**6. WORKER SAFETY Protect workers' health and safety from exposure to cyanide.**

**Standards of Practice**

**6.1 Identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 6.1.

**Describe the basis for the Finding/Deficiencies Identified:**

CGML has documented SOPs available on the company intranet. These include procedures that address cyanide delivery and unloading, mixing, plant operations and entry into confined spaces. Procedures specify the use of appropriate PPE and requirements for pre-work inspections

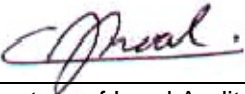
Prior to undertaking any maintenance or tasks, including cyanide related work tasks, workers are required to complete a Job Safety Analysis (JSA) assessment. The JSAs are required for any scheduled or unscheduled work activity that may have a history or potential for injury, near misses or losses; tasks carried out in new environments; tasks undertaken by new workers or that are rarely performed and tasks where work conditions have changed. All JSA forms must be authorized by a Supervisor before work can commence. JSA forms are periodically reviewed and updated as required. Additionally, the electronic preventative maintenance system JD Edwards (JDE) generates maintenance work orders for which a JSA is automatically generated. CGML also operates a system of Hazard Report Booklets which are used extensively by workers within the plant to identify workplace hazards.

Certain high hazard tasks such as confined space entry, hot work and working at heights requires Safe Work Permits.

SOPs for unloading of containers, de-stuffing of boxes, transporting cyanide to the mix area and the mixing process require that pre-work inspections are conducted prior to the work commencing. The inspections include testing of showers and eye wash stations, observing wind direction, barricading of work areas, use of warning signage and use of HCN monitors. Pre-work inspections are also required as part of JSAs and Work Permits for confined space entry.

The Chirano Gold Mines Limited Change Management Procedure which is designed to control all temporary and permanent changes that may introduce health safety and environmental hazards. The procedure requires that appropriate risk assessments are undertaken including the potential for harm to people, environmental damage, effects on the public, and adverse effects to operations.

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Major Facility Upgrades requiring significant capital expenditure will also be subject to the Kinross AFE authorization process as required in the Kinross Gold Corporation Non-Routine Spending and Capital Management Policy (February 2011).

CGML provides opportunities for workers to provide input in developing and evaluating health and safety procedures. These include participating in daily tool box talks; weekly and monthly meetings safety meetings during which supervisors, shift workers and engineering staff have the opportunity to discuss various topics including both existing and new SOPs; filling out and submitting Hazard Booklets and submitting ideas into a suggestion box.

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

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 6.2.

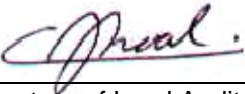
*Describe the basis for the Finding/Deficiencies Identified:*

SOPs for safe operation of the CIL circuit provides a checklist of steps to be followed by the operator responsible for the CIL Plant. The generation of high HCN gas levels is identified as a potential hazard and the procedure requires that pH be maintained between 10 and 11. The procedure also requires that the pH of the leach tank is checked manually and sampled regularly. Large variations in pH (>0.5) are required to be reported to the Shift Supervisor. It was noted that SOP CM/PP/04 incorrectly made reference to pH being maintained at 10 – 11 pm. CGML subsequently provided an updated procedure amending pH levels to the logarithmic scale. The pH in the Leach Tank is analyzed every 2 hours and the lime addition adjusted to maintain pH above 10.

During cyanide mixing, caustic is added to the mix tank to ensure that pH is 10.5 before closing the caustic addition valve. The pH level in the mix tank is monitored by the control room during mixing operations.

The majority of plant infrastructure remains sited in the open and therefore the potential for build-up of significant concentrations of HCN gas is low. Areas of potential HCN build-up have been identified at the Elution Circuit, Gold Room, Mix Area and the Leach Tank addition point. These area are fitted with fixed OTIS Instruments OI 6000 Gen II HCN monitors that are calibrated to alarm at 4.7 ppm and 10 ppm. For tasks related to cyanide handling and where there is a potential for cyanide exposure, workers are required to make use of portable HCN monitors (also calibrated to alarm at 4.7 ppm and 10 ppm HCN) and wear full face respirators fitted with filter cartridges. Personal monitors comprise thirteen functioning BW Gas Alert

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Extreme and two MSA Altair 5x portable HCN monitors. A further four personal monitors were out of commission at the time of the site inspection.

Calibration of both fixed and portable personal monitors is carried out quarterly by third party specialist to a preventative maintenance schedule assigned through JDE. Records reviewed confirm that calibration was undertaken by either by third parties or the CGML Electrical Department.

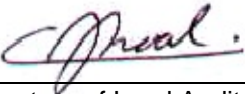
Workers operating in areas where high HCN levels are recorded are required to wear full body protection with full face respirator mask with an in date cyanide canister and a personal gas monitor. In the event that HCN levels are recorded above 10 ppm, the affected area is to be cordoned off and the Shift Supervisor informed. No one is allowed to enter an area where HCN levels exceed 10 ppm without full body protection with full face respirator mask. If gas concentrations exceed 60 ppm, the area is to be evacuated and only entered by personnel wearing self-contained breathing apparatus (SCBA).

CGML has implemented a Respiratory Protection Plan to establish standard operating procedures for protection of all employees from respiratory hazards through proper selection and use of respirators. This program applies to all employees who are required to wear respirators during normal operations, non-routine tasks or emergency operations such as a spill of a hazardous substance. The plan designates the HSE Department with responsibility for oversight of the program, and Supervisors with responsibility for ensuring implementation in their particular area of responsibility. The Hygiene Department conducts qualitative and quantitative respirator fit testing for the Emergency Response Team (ERT) and all employees identified as requiring use of respirators. Training on respirator use is also provided annually to Process Plant Supervisors and Operators. The Hygiene Department also conducts monthly inspections of respirators for condition of face shield, straps, valves, cartridges and rubber components.

Warning signage was prominently displayed at key areas within the plant and in areas where cyanide is used. Cyanide warning signs were posted on security gates and fencing to the plant site, the cyanide mix tanks and storage tanks and the CIL Plant. No drinking or eating signage was displayed throughout the plant. Smoking is also not permitted within the plant, offices or in vehicles. Pipelines containing cyanide solution were labelled with purple color coded signage with the direction of flow also shown. During the site audit it was noted that signage indicating cyanide piping leading from the mix area and a portion of pipeline leading up to the leach tank was not clearly visible. CMGL subsequently provided evidence of improved signage in these areas. Signage at the TSF has been retained warning of the presence of cyanide and not to use the water in both English and the local language.

Showers and eyewash stations are strategically positioned at twenty six locations around the plant including the warehouse, Mix Plant, Elution Circuit, and CIL Tanks. The showers and eyewash stations are inspected monthly by the Safety Department utilizing a checklist system.

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Weekly planned maintenance of safety showers is also scheduled through the JDE preventative maintenance system.

Fire extinguishers are located at strategic locations within cyanide use areas and are dry chemical type ABC and Unix extinguishers. Fire extinguishers are inspected on a monthly basis by the Safety Department and recorded on an inspection tag located on the extinguisher. Fire extinguishers are re-pressurized or refilled by the HSE Fire Department as required.

Material Safety Data Sheets (MSDS) are available in English and posted at prominent areas around the plant including areas where cyanide is used, handled or stored.

CGML has prepared a Cyanide First Aid Training Manual which is a reference document that applies to all authorized CGML Process Plant operators and those involved with cyanide related tasks. The manual describes the forms of cyanide, use within the plant, cyanide hazards, the health effects of exposure, first aid treatment and the use of Oxy-viva and resuscitator kits.

Accident investigations are undertaken in accordance with the Standard Operating Manual (SOM) Procedure 'General Incident Reporting and Investigation'. The procedure describes the process for reporting and investigating all health, safety and environmental incidents including those involving cyanide.

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

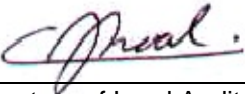
The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 6.3.

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

Shower and eyewash stations are located at strategic areas around the plant. Three Oxygen resuscitator kits (Oxy-viva) are retained, and are located in the cyanide mixing area, CIL Control Room, emergency first aid post and warehouse. A further Oxy-viva kit is stored in the clinic ambulance. First aid boxes are stored in the First Aid Post and are regularly checked by a member of the Safety Department permanently stationed at the Post. First aid equipment in the ambulance and PPE used by medical staff are checked on a daily basis. The Oxy-viva resuscitation bottle, oxygen bottle and other equipment stored in the ambulance is inspected in accordance with a checklist.

CGML has obtained five SCBA units which are stored at the First Aid Post. Training on the use of SCBA equipment has been provided to members of the emergency response team. At the time of the onsite audit it was noted that SCBA bottles were depleted of air. CGML indicated

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that the procedure for replenishing the SCBA sets was to use a compressor located at the Golden Star Resources Bogoso Mine. To avoid refilling delays CGML purchased a compressor in 2015 to provide onsite refilling capability. However, due to an electrical fault the compressor has never operated resulting in long periods where SCBA bottles remain depleted after use. Subsequent to the onsite audit, CGML completed repairs to the onsite compressor and provided photographic evidence that SCBA bottles had been refilled. In July 2016 the Hygiene Department prepared and implemented a checklist to be used in SCBA inspections. The Inspections are completed daily by members of the safety team and include an assessment of tank pressure, tank and mask condition.

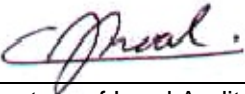
Cyanide antidote kits comprise four hydroxocobalamin (Cyanokits) which is administered intravenously by a trained medical practitioner at the CGML clinic. The Cyanokits are monitored by the Dispensary Technician who maintains an electronic inventory indicating stock levels and expiry dates. In addition a six monthly manual check of expiry dates is also undertaken. All kits were within their expiry dates (December 2017).

All sectional Operators have access to two way radios. Supervisors and Managers are also equipped with mobile cell phones. Emergencies are reported through Radio Channel 1. In addition, the plant operates Gai-tronics and Cisco phone systems. In the event of an emergency, the discoverer says the words "emergency" 3 times. On an emergency being declared the Control Room Operator activates an emergency siren. The Shift Supervisor then vacates the area and workers proceed to designated assembly points.

Oxy-viva kits located in the process areas and warehouse are inspected monthly. However during the site inspection, it was noted that the Oxy-viva bottles are dated 2005 and have not been returned to the manufacturer as per instructions (3 years after first purchase and every 5 years thereafter) for testing. Subsequently, CGML developed procedure CM/PP/HSE/001 Oxy-viva Resuscitator Operating and Maintenance Procedure detailing the safe operation, monitoring, testing, refurbishment and oxygen replacement requirements. The procedure requires that the oxygen content is discarded and refilled if not used after three years and that the cylinder is to be returned to a certified body three years after purchase and subsequently at five yearly intervals for statutory safety testing. Prior to the submission of this report CGML provided confirmation that replacement Oxy-viva bottles had been ordered and they were awaiting delivery.

CGML has an overarching emergency response plan (ERP) titled "Emergency Response Procedures – Surface" (ERP-S). In addition, a plant specific Emergency Response Plan "Process Plant Emergency Response Plan (ERP-P) addresses site specific responses to plant emergencies including minor and major cyanide releases. First aid actions to be taken by the discoverer and the Shift Supervisor for cyanide releases are described as well as call out details for the site Ambulance. First aid training is provided to all Process Plant workers and the ERT. CGML's Emergency Call Out Procedure sets out steps to be followed in the event of an emergency.

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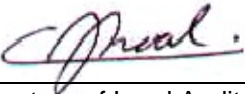
Procedures for first response to cyanide exposure are provided on signs posted in prominent areas of the plant. In the event of an emergency the discoverer is required to tune to Radio Channel 1 (for surface operations) and call out emergency three times and provide information such as name, department, location of the emergency, the nature of emergency, the number of people injured and any special items or assistance required. Emergency phone numbers are also provided for the cellular phone service provider (MTN) emergency dial out number, Medical Doctor, Safety Superintendent, Senior Security Supervisor and Environmental Superintendent.

CGML continues to operate a medical clinic located an approximate 5 minute drive from the process plant. The clinic is manned by medical staff who have received training on responses to cyanide emergencies. CGML operates two ambulances manned by three Ambulance Drivers and have the capacity to transport workers to the clinic for medical emergencies. In the event that more extensive treatment or observation is required, CGML can make transportation arrangements to a regional hospital for example Bibiani District Hospital (BDH). The clinic has implemented SOP "*Kinross Chirano Medical Centre Standard Operating Policy & Procedure, Cyanide Management Protocol*" which describes medical protocols for the treatment of cyanide poisoning.

The Process Plant has a trained ERT comprising 26 members, all of whom work within the Process Plant. The Safety Department provides training to the ERT regarding cyanide awareness and emergency response training. Plant workers and the ERT are trained to administer medical oxygen, if required, during first aid response.

The ERP-P requires that comprehensive emergency response drills with scenarios involving cyanide are completed annually and that the ERP-P and associated spill response plans are reviewed and updated based on the post drill evaluation. Since 2012, CGML have completed a total of six mock drills; three of which completed in 2015 and 2016 involved cyanide scenarios. These mock drills involved worker cyanide exposure at a TSF pump, worker exposure to HCN gas while inspecting the warehouse, and a confined space emergency.

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**7. EMERGENCY RESPONSE Protect communities and the environment through the development of emergency response strategies and capabilities.**

**Standards of Practice**

**7.1 Prepare detailed emergency response plans for potential cyanide releases.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 7.1.

**Describe the basis for the Finding/Deficiencies Identified:**

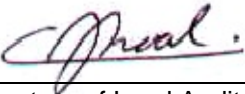
CGML continues to operate an overarching Emergency Response Procedures (ERP-S). This plan provides instruction for emergency call-out procedure, and general roles and responsibilities of employees, supervisors, superintendents, and medical staff during an emergency. The ERP-S is supplemented by site-specific response plans for the Process Plant (ERP-P) and underground mining operation and by an online Kinross Crisis Management System that addresses communications during an emergency. The ERP-P references and is supplemented with separate standard operating procedures that address plant and cyanide emergency situations including dry and liquid cyanide spills both within and outside of containment areas.

The emergency response plan specific to the Process Plant is detailed in the "Process Plant Emergency Response Procedure" (ERP-P). The intention of the ERP-P is to provide process plant personnel with a logical and comprehensive process to responding to an emergency event within the Plant Area. The ERP-P includes emergency procedures to be followed in the event of a minor or major solid/liquid cyanide release, fire emergencies including those involving cyanide, responses to injuries and/or fatalities, tailings dam failure, uncontrolled seepage from tailings dams and tailings or return water pipeline failure. Evacuation responsibilities and procedures are also described in the plan. The Plan; however, did not provide a reference to, or adequate instruction on clean up or remedial procedures to be followed in event of a cyanide release. Subsequent to the field component of the audit, CGML updated the ERP-P to reference associated SOPs and provided more detailed instruction on response actions to be followed for both solid and liquid spills.

Transportation emergencies are the responsibility of Cyanco and their transporter Vehrad in Ghana. Vehrad has developed an Emergency Response Plan (VERP) which addresses cyanide release emergencies during transportation.

The ERP-P sets out procedures for contacting communities and the public in the event of a tailings dam or pipeline failure. The Community and Public Relations (CPR) Superintendent in

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consultation with the HR & CPR Manager is responsible for contacting and informing all local communities along water courses potentially effected by a spill and to arrange tanker potable water supplies as required.

First aid procedures are described in the ERP-P, Medical Centre Standard Operating Policy & Procedure, Cyanide Management Protocol and the Cyanide First Aid Training Manual. The ERP-P allocates the Medical Superintendent and the Medical Team as responsible for administering first aid to cyanide exposure cases. Since the Cyanokit antidotes can only be administered intravenously, this can only be undertaken by a trained medical practitioner.

The Kinross Crisis Management System provides communication requirements that vary depending on the overall level of severity of an incident. For low severity incidents such as a minor spill or an injury that does not result in lost time or hospitalization, communication would be within the Site Crisis Management Team. For medium severity incidents the Regional Crisis Management Team would be involved and for high severity incidents, such as a multiple fatality or situation that could impact a local community, the Corporate Crisis Management Team would become involved. In the event of a situation that may affect a downstream community, the Security Manager will contact the local authorities and in consultation with the Human Relations/Community Relations Manager, will arrange to inform all persons downstream of the incident.

**7.2 Involve site personnel and stakeholders in the planning process.**

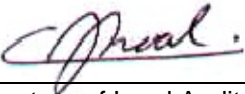
The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 7.2.

***Describe the basis for the Finding/Deficiencies Identified:***

The ERP-P has been developed with input from multiple stakeholders and key site personnel including Supervisors, Heads of Department and the Safety Superintendent. The ERP-P provides a logical and comprehensive description of how to respond in the event of an emergency within the Plant. The development, maintenance and implementation of the ERP-P is the responsibility of the Process Manager. His responsibilities also include training process personnel in the appropriate aspects of the ERP-P. The ERP-P was prepared by the Process Plant supervisors and managers with assistance of the Safety Superintendent to supplement and provide integration into the ERP-S and Kinross Crisis Management System.

The ERP-P review procedure requires that the plan is reviewed at least once every two years or after an incident and mock drill. The review team includes managers from Processing, Engineering, Production, Metallurgy, Maintenance and Safety. The emergency response team has the opportunity to provide input to the ERP-P through the debriefing process following each mock drill exercise.

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CGML has continued to provide a robust community outreach program which is managed through the Community Relations Group. The program provides multiple organized opportunities for local communities to communicate issues related to the mining operation including those related to cyanide. CGML representatives also regularly attend the quarterly local community council meetings and have established a "Community Consultative Committee" that meets regularly to discuss mining-related issues. These outreach initiatives provide opportunities to discuss emergency response planning and solicit feedback. CGML maintains an "open door" policy regarding stakeholder concerns, and actively evaluates and responds to requests for information or specific complaints. Records are maintained of all significant contacts and subsequent actions.

CGML has produced an Environmental Management Plan (EMP) that includes steps for managing any significant environmental impacts including those that may involve cyanide. Copies of the EMP are provided to the District Assembly Local Authority whose membership includes Opinion Leaders (Community Leaders) who are able to provide feedback through CGML's open door policy of communication.

CGML have maintained contact with local hospital, police and fire services as part of their community dialogue initiatives; standing agreements are in place with Bibiani Hospital to provide additional medical services and support to the Mine Clinic for cyanide emergencies. CGML maintain their own firefighting capability, nevertheless have a mutual aid agreement with the Ghana National Fire Service in Sefwi Wiawso Municipality to provide assistance in the event of a large emergency. The Fire Service is familiar with the site through periodic fire inspections. CGML have an informal agreement with the military to provide nightly patrols and support in the event of an emergency.

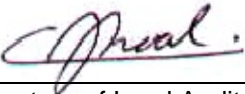
**7.3 Designate appropriate personnel and commit necessary equipment and resources for emergency response.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 7.3.

*Describe the basis for the Finding/Deficiencies Identified:*

The ERP-P designates the Process Manager as the Incident Controller and in his absence the most senior person (Production or Metallurgical Superintendent) is designated the role. The Process Plant has a 26 member ERT formally appointed by CGML. The names of ERT members are posted on notice boards in the Process Plant. However, it was noted that the list did not contain 24 hour contact information for individual members on the basis that the ERT is always comprised of team members present on shift and therefore available on two way radio. CGML subsequently provided an updated list of ERT Members containing 24 hour contact telephone numbers.

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The Process manager is responsible for ensuring that the ERP-P is developed, implemented and maintained. The ERP-P sets out specific training requirements including an overview of the ERP-P, basic fire prevention and use of fire extinguishers, hazard identification and risk assessment and cyanide training.

The type and location of emergency equipment available within the plant is listed in the ERP-P. CGML also retains a list of emergency response and first aid equipment contained within the emergency cabinet at the cyanide mix plant and a mobile emergency trailer. The ERP-P requires that inspections and tests of emergency equipment and facilities must be recorded.

CGML continues to maintain suitable capability to handle most type of emergencies and therefore has not allocated specific roles for outside responders within the ERP-P. In the event of a major fire, the ERP-S contains contact information for the Sefwi Wiawso and Bibiani Fire Services but does not designate a specific role.

#### **7.4 Develop procedures for internal and external emergency notification and reporting.**

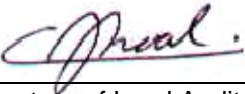
The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 7.4.

#### ***Describe the basis for the Finding/Deficiencies Identified:***

The ERP-S provides emergency call out procedures and 24 hour contact numbers for managers, medical and other key responders. The ERP-P also provides call out procedures for various emergency scenarios including 24 hour contact information for the Incident Control Team. A general Emergency Call-Out Procedure is displayed at prominent locations around the plant and provides information on the radio channel or phone numbers to be used and information to be reported to the Control Room.

Upon discovering an emergency, the first action is to alert the Security Control Room through Radio Channel 1 or the designated emergency response phone numbers. Security Control then announces an emergency and declares radio silence except for communications relevant to the emergency. Subsequent procedures vary slightly depending on the nature and severity of the incident. For minor cyanide releases, the Security Controller then declares an emergency and contacts the Shift Supervisor to relay information. The Shift Supervisor then determines further action i.e. if medical assistance, clinic notification or cyanide clean-up is required. For major cyanide releases, the procedure is similar. However should evacuation be required, the Shift Supervisor contacts the Control Room Operator to initiate the emergency siren and then reports to the Emergency Control Centre and assumes the duties of the Incident Controller. The Incident Controller then briefs the Production Superintendent (or nominee) and the Emergency Controller of the nature of the incident, casualties and potential

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for escalation. If necessary the Security Controller will also notify the Emergency Response Team.

The ERP-S requires that in the event of an incident on a public road, Security will immediately inform the local authorities and initiate actions to assist the local authorities to prevent access to scene of the emergency. The Area Manager is responsible for ensuring that relevant contact information is up to date.

The ERP-P does not include community contact information; however in the event of large spill or TSF release potentially affecting downstream communities, the Security Superintendent in conjunction with the CPR Superintendent and HR&CPR Manager are responsible for contacting local authorities at each of the downstream communities. Standard Operating Procedure for Cyanide Spillage Notification in the Communities sets out community contact procedures in the event of a cyanide release.

**7.5 Incorporate into response plans monitoring elements and remediation measures that account for the additional hazards of using cyanide treatment chemicals.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 7.5.

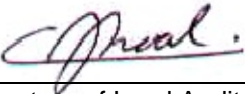
*Describe the basis for the Finding/Deficiencies Identified:*

The ERP-P describes various emergency scenarios including minor and major cyanide releases and refers to spill clean-up SOPs for liquid and solid cyanide spills inside or outside of containment areas. As described in 7.1 the ERP-P was updated following the field component of the audit to specifically reference the above SOPs and provide immediately accessible actions to be followed for liquid and solid spills.

CGML has SOPs in place to monitor the effectiveness of cleanup after a liquid or solid cyanide spill that details the frequency of sample collection from water and soil, sampling methodology, remedial targets; and sample storage, handling and transportation requirements. A procedure is also in place to provide an alternate drinking water supply in the event of an impact to community water sources.

For solid and liquid spills outside of containment, procedures specifically prohibit the use of sodium hypochlorite, ferrous sulfate and hydrogen peroxide as treatment agents due to toxicity to aquatic life.

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**7.6 Periodically evaluate response procedures and capabilities and revise them as needed.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 7.6.

*Describe the basis for the Finding/Deficiencies Identified:*

The ERP-P must be reviewed at least every two years and after every incident or mock drill that reveals a shortcoming. The HSE Manager is required to approve the plan upon the completion of each review. Emergency response drills are conducted annually and feedback on the effectiveness of the emergency management process is required to be recorded and included in the review of the ERP-P. In addition, procedure CM/PP/002 – Process Area Emergency Response Drills and Drill Evaluation describes drill planning.

The ERP-P requires that mock emergency drills with scenarios involving cyanide are conducted at least annually and a procedure is in place for planning, scheduling, designing, evaluating, and reporting on these drills and execution of any recommendations and corrective action coming out of these drills. Since 2012, CGML have completed a total of six mock drills; three of which involved cyanide.

Review of records show that cyanide drills have considered human health based exposures but not environmental releases that would specifically test the response of the ERT. Additionally, cyanide related drills within the plant have been limited to within the main Plant area and the TSF and has not considered other scenarios such as a transport related incident for example along the plant access roads. Subsequent to the field component of the audit, CGML provided a mock drill schedule for 2016 which includes scenarios planned for October and November involving cyanide release outside of containment, adjacent to a water body and along an access road.

**8. TRAINING Train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner.**

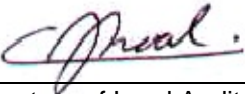
***Standards of Practice***

**8.1 Train workers to understand the hazards associated with cyanide use.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 8.1.

*Describe the basis for the Finding/Deficiencies Identified:*

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All visitors, contractors and new employees entering the CGML site are required to undergo General Mine Induction training which presents site safety information and attendees are required to complete a written exam to confirm understanding of the induction contents. More detailed Process Plant Induction training is then provided to all new employees, visitors and contractors that may encounter cyanide. The contents of this induction includes a description of the use of sodium cyanide in the Process Plant including areas of use.

The Process Training Coordinator in conjunction with the Plant Safety Department provides the majority of training to plant personnel. The HSE Department identifies specific training requirements for certain management level Process Personnel such as the Safety Superintendent, Plant Safety Officer and engineering staff (e.g. Emergency Medical Response, First Aid Training, Management of Change, Fire Safety Management). Training requirements are tracked on training matrix which is maintained by the Process Training Coordinator. Cyanide awareness training records covering the past three years in the form of attendance registers.

Plant specific training is provided to all Process Plant personnel in the form of cyanide operations training whereby the cyanide lifecycle is followed throughout areas of the plant. Process Plant employees receive training on cyanide awareness, use of PPE, cyanide specific task training, cyanide spill management, decontamination procedures, first aid, and use of emergency equipment. Training is also conducted during toolbox talks. In the past three years topics have included an overview of chemical hazards and management, hazard awareness, job hazard analysis, and hazard communication. Training needs are identified on a training matrix prepared and maintained as current by the Process Training Coordinator.

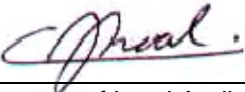
**8.2 Train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 8.2.

***Describe the basis for the Finding/Deficiencies Identified:***

All employees undergo task specific training which includes the theory behind SOPs and subsequent training on relevant modules developed specifically for Process Plant tasks including cyanide related tasks. Training includes written examinations to confirm understanding of the training module and must be passed before operators or employees are allowed to work alone onsite. Employees are also required to undergo on the job training with a Supervisor or experienced plant operators until approved to be competent at their tasks before being allowed to work alone. Processes which are included in task training include leaching, elution, milling, crushing, tailings management and the use of chemical reagents such as cyanide. The Process Training Coordinator has developed training modules for each

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task involving cyanide or cyanide management based upon written SOPs developed for each work task.

CGML continue to provide training using suitably qualified and experienced trainers. Process Plant specific inductions are presented by the Safety Department Safety Officers who are suitably qualified through education or experience. The Process Training Coordinator who has overall responsibility for health and safety training in the plant, is a health and safety professional and metallurgist with 12 years' experience. Certain task specific training may be led by experienced Supervisors or by the Plant Metallurgist who would provide direct instruction and on the job training.

Training on the use of Oxy-viva kits is undertaken by the Medical Superintendent who is a qualified medical Doctor. Face Fit testing and training is undertaken by the Occupational Health and Hygiene Department and SCBA training by the appointed Emergency Response Coordinator. General Mine Induction is completed by an HSE Officer.

Refresher training of the ERT is carried out as a minimum once every two years, with annual mock drills which are completed as a requirement of the ERP-P also considered as refresher training for the ERT. Toolbox talks are conducted for each Process Plant shift on a daily basis and these include training refreshers on cyanide related topics such as planned task observations, job hazard analysis, hazard identification awareness, cyanide awareness, use of PPE, and MSDS information. Weekly and monthly safety meetings also include topic discussions on safety including cyanide management.

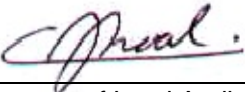
Planned task observations are routinely carried out by Supervisors, and retraining is carried out where shortcomings are identified. Corrective actions identified are entered into the INX safety and incident management software where the action is assigned to individuals and tracked.

CGML retain training records throughout the individual's employment and records are maintained by the HSE Department, Process Safety Department and Process Training Coordinator. Training records reviewed covering the past three years included attendance sheets and/or written exams for inductions, task specific training, cyanide awareness training, emergency response and equipment training (e.g. Oxy-viva, SCBA, Face Fit training). Records include the training topic, the name of the trainer, training date and the signature of the attendee.

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

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 8.3.

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**Describe the basis for the Finding/Deficiencies Identified:**

All Process Plant personnel including those that undertake cyanide related tasks such as cyanide unloading, mixing, production and maintenance have received cyanide awareness, task specific and operational procedure training. Training is also provided on emergency response procedures such as cyanide spill management, decontamination, detoxification, first aid, and the use of emergency equipment. General Mine Induction and Process Plant Induction training is provided to all personnel operating in the plant and includes procedures to follow for emergencies including cyanide releases. In the event of a cyanide release workers are trained to contact Security Control on radio Channel 1 or using emergency contact numbers and provide the location and description of an emergency, recognize emergency sirens, know the location of muster points, ensure their own safety first before undertaking any mitigation actions, how to stop a release through shutdown procedures, provide first aid if safe to do so, isolate the area and abandon the area if necessary. Site personnel are aware of the application of Cyanokit antidotes; however, because the antidote must be administered intravenously, application is restricted to medical staff located at the mine clinic.

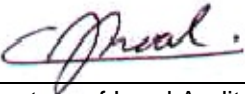
The ERT conducts periodic cyanide emergency mock drills which includes cyanide exposure scenarios to test response effectiveness. The Process Plant has conducted three cyanide scenario mock drills since 2013. The mock drills are evaluated to identify recommendations to improve emergency response or where procedural shortcomings are identified. Corrective actions are recorded and tracked to completion on computerised incident tracking system.

Also, in 2015 CGML, the Crisis Management Team in coordination with the Regional and Corporate Crisis Management teams conducted a table top training exercise involving a failure of the TSF resulting in a flow towards a nearby community to test their effectiveness using the online Kinross Crisis Management System. The system defines responsibilities, guidelines and assigns resources for the management of potential crises and would be used for all significant emergency situations.

CGML continues to maintain their own response capability for most types of medical or fire emergencies and therefore has not allocated specific roles for outside responders within the ERP-P. In the event that additional medical support is required, CGML have a standing agreement in place with Bibiani Hospital to assist with medical emergencies. In addition CGML has a mutual aid agreement with the Ghana National Fire Service in Sefwi Wiawso Municipality to supplement their own firefighting capabilities in the event of a large fire emergency.

CGML has an extensive community outreach program and continues to provide educational programs, awareness training and emergency response training to communities within the catchment area. In the last three years these programs have included organized educational visits to the mine site for community leaders (8th March 2014) and for school parties (28th March 2015, and 4th October 2015). Also, cyanide awareness training was provided to the

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settlements of Ntrentreso and Lawerkrom on 20th April 2016. These training sessions included presentations by and discussions with CGML's Metallurgical Manager.

Cyanide related training records for Process Plant employees and ERT Members are retained by the HSE Department, Process Safety Department and Process Training Coordinator. Training records reviewed included attendance sheets and/or written exams for inductions, task specific training, cyanide awareness training, emergency response and equipment training. Records include the training topic, the name of the trainer, training date and the signature of the attendee. Employee understanding of training topics is demonstrated through completion of written examinations. Furthermore, employees are required to undergo on the job training with a Supervisor or experienced operators until proven to be competent at their tasks before being allowed to work alone. Employees are also subject to planned task observations and on the job evaluations to demonstrate understanding of tasks and SOPs.

**9. DIALOGUE Engage in public consultation and disclosure.**

***Standards of Practice***

**9.1 Provide stakeholders the opportunity to communicate issues of concern.**

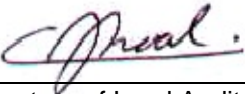
The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 9.1.

***Describe the basis for the Finding/Deficiencies Identified:***

CGML operations are located in a populated rural area of Western Ghana. Since the 2012 ICMC verification audit CGML has continued to provide a robust community outreach program managed through the Community Relations Group (CRG). The program provides multiple organized opportunities for local residents and officials to communicate issues related to all aspects of the mining operation, including the use of cyanide. Except for dedicated haul roads, roadways between CGML facilities may have public vehicle and foot traffic, and there are numerous footpaths across mine lease areas that also connect villages, grazing areas, and farming plots. The program reaches out to communities (Akoti and Etwebo) within the mining lease, (Paboase) just outside the southern lease boundary, and several small villages and towns to the north, south, and southwest of the current mine license area.

The CRG currently has 13 community liaison officers responsible for ongoing liaison and public outreach functions. CGML maintains an "open door" policy regarding stakeholder concerns, and actively evaluates and responds to requests for information or specific complaints. Records are maintained of all significant contacts and subsequent actions. CGML representatives regularly attend the quarterly council meetings held by each paramount chief. CGML has also established a "Community Consultative Committee" that meets regularly to

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discuss mining-related issues; stakeholder participants include local tribal chiefs or sub-chiefs, representatives from the paramount chiefs, the police, the Bureau of National Investigation, and elected representatives from the district assembly. In addition, CGML has established development committees for the three communities in and immediately adjacent to the CGML's leasehold.

Communication by community members is predominantly through telephone or directly during community meetings and contact numbers have been provided to all villages and are also posted on village noticeboards. Public concerns are reportedly related mostly to air and noise type impacts from blasting operations and land related issues; there have been no reported cyanide related complaints during the past three years.

CGML's community relations performance is audited annually by Ghana EPA as part of AKOBEN. Review of available reports that cover the period 2012 through 2014 show that CGML has scored 100% for complaints management and community engagement, and 100% for corporate social responsibility, indicating that the company has a good complaints management system and a strong commitment regarding social responsibility.

**9.2 Initiate dialogue describing cyanide management procedures and responsively address identified concerns.**

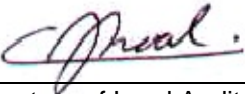
The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 9.2.

*Describe the basis for the Finding/Deficiencies Identified:*

In addition to meetings with paramount chiefs and the Community Consultative Committees, CGML continues to provide educational programmes and cyanide awareness and emergency response training to communities within the catchment area. In the last three years these programs have included organized educational visits to the mine site for community leaders and school parties and cyanide awareness/emergency response training sessions to communities. These training sessions have included presentations by and discussions with CGML's Metallurgical Manager.

Many of the mine employees are from local communities so that general information about cyanide goes back to the community through employees. The mine also supports a hiring program whereby local villagers are hired for a year, to create a larger potential labour pool. This has also contributed to community familiarity with cyanide use at the operation over the past several years. The Community Relations Manager reported that the communities have a growing understanding of the manner in which CGML responsibly manages cyanide and are now less concerned about cyanide use at the mine.

Chirano  
Name of Mine

  
\_\_\_\_\_  
Signature of Lead Auditor

15 November 2016  
Date

**9.3 Make appropriate operational and environmental information regarding cyanide available to stakeholders.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 9.3.

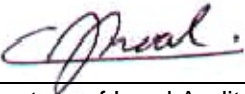
*Describe the basis for the Finding/Deficiencies Identified:*

Because literacy is not strong in the village communities much of the information on cyanide is presented verbally in the local language, and in PowerPoint presentations; copies of which are left with the village heads. Emergency response and mine contact numbers are also posted in the villages. General information about cyanide use and the Cyanide Code is also provided on the Kinross web site and the Ghana EPA web site provides information of Chirano's environmental and social performance through its required participation in the AKOBEN audit program.

In the last three years, CGML has not experienced any cyanide exposures, off-site cyanide releases or events that have resulted in significant adverse effects to health or the environment. An accidental breach of a tailings pipeline did occur in 2011; although the release was immediately contained within the mine's lease boundary. In this incident potentially affected communities were immediately informed because of their proximity to the site. Also drinking water was supplied by truck until it was confirmed that water quality had not been impacted. If a significant cyanide incident were to occur in future, the community relations program would require organized discussion of such incidents and any associated corrective actions with local and regional community residents and community officials via regularly scheduled meetings and *ad hoc* meetings of the Community Consultative Committee, as described in 9.1 above.

CGML's environmental performance is also audited annually by Ghana EPA as part of AKOBEN and the results are made publically available on the Ghana EPA website. Review of available reports that cover the period 2012 through 2014 show that CGML scored a 100% with regards to Category 2A "Hazardous and Toxic Waste-Onsite Management, Spills and Accidents", indicating that there has been no incidence of spill of tailings that entered the environment or affect the nearby communities.


Chirano  
Name of Mine

  
\_\_\_\_\_  
Signature of Lead Auditor

15 November 2016  
Date

**Attachment A:**  
**Corrective Action Requests**  
**FINAL**



<p style="text-align: center;">   <b>CORRECTIVE ACTION PLAN</b>  <b>ICMC Certification Audit – Chirano Mine</b> </p>	<p> <b>Control No.:</b>  <u><b>CGML-ICMC-CAR-01</b></u>    <b>Date issued:</b> 15 November 2016 </p>
<p><b>ICMC Standard of Practice Section Reference:</b> 4.1(1)</p>	
<p><b>Description of Deficiency: Cyanide Containers Storage Pad</b></p> <p>The process water used in the mill is a mixture of decant water from the TSF and overflow from the pre-leach thickener. The cyanide concentration in this process water has been maintained consistently in the general range of 0.005 to 0.01 mg/L, i.e., well below 0.5 mg/L WAD over the past three years, and therefore the mill and pre-leach thickener have not been considered cyanide facilities. However, analytical results for process water showed concentrations of 16.6 mg/L and 6.5 mg/L WAD, respectively in February and March 2016, returning to 0.008 mg/L in April 2016. The results of a root cause analysis completed subsequent to the field component of the audit determined that the elevated levels in the thickener resulted from a need to return slurry (containing loaded carbon) from the event pond back into the process. This is occasionally necessary when national power issues and operational upsets result in slurry having to be directed to the event pond.</p> <p>To ensure that process water is not impacted by such events in the future CGML updated Procedure CP-CM/013 Process Water WAD Cyanide Monitoring and Management to require sampling of the event pond after such an event and prior to the slurry being pumped from the event pond to determine how and when slurry in the event pond may be pumped back to the process and to monitor process water and thickener overflow to ensure that process water in the mill does not exceed the threshold value of 0.5 mg/L. Nevertheless, even with this procedure in place, results of daily analysis were showing WAD cyanide in process water at concentrations between 0.3 mg/L and 1.3 mg/L even though in the thickener overflow concentrations were being maintained consistently below 0.5 mg/L.</p> <p>CGML realized that the decant/reclaim water does not mix well with the thickener overflow in the ponds before sampling was completed and this may explain the elevated readings still being found. To obtain a truer representation of the WAD cyanide levels in the mill CGML initiated a sampling program of the mill slurry. A preliminary result of a sample collected on 2 August showed that WAD cyanide concentration in the mill was below the WAD cyanide threshold for a cyanide facility of 0.5 mg/L.</p>	
<p><b>Corrective Action Required (describe/attach supplemental information as necessary):</b></p> <p>To be fully compliant with this requirement of the Code CGML needs to provide evidence to demonstrate that WAD cyanide concentrations in the mill are consistency maintained below 0.5 mg/L. Alternatively CGML must consider the mill to be a cyanide facility and provide evidence to confirm that the facility was constructed according to accepted engineering standards and specifications as per Section 4.8 of the Cyanide Code, and that management and operating</p>	


systems are in place to protect human health and the environment including contingency planning and inspection and preventative maintenance procedures.

**Evidence Required for Verification of Corrective Action Completion:**

- Data collected over a 3 month period (daily and/or weekly sampling as appropriate) to demonstrate that the process water used in the mill is consistently maintained below 0.5 mg/L WAD cyanide; or
- QA/QC and engineering sign-off of facility construction, or evaluation report by an appropriately qualified person that the mill facility, if continued to operate within established parameters will be protective against cyanide exposures and releases: and operating procedures are in place to protect workers and prevent releases to the environment.

**Corrective Action Completion Date:** 31 January 2017

Approved:   
Lead Auditor  
Date: 15 November 2016

Approved:   
Auditee Representative  
Date: 15 November 2016