SUMMARY AUDIT REPORT

for the January 2009
International Cyanide Management Code Audit

Prepared for:
Golden Star Resources Ltd., Wassa Operations

Submitted to:
International Cyanide Management Institute
1200 "G" Street NW, Suite 800
Washington, D.C. 20005

September 17, 2009

GeoEngineers, Inc.
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SUMMARY AUDIT REPORT

Name of Mine: Wassa Mine

Name of Mine Owner: Golden Star (Wassa) Limited.

Name of Mine Operator: Golden Star (Wassa) Limited.

Name of Responsible Manager: Michael Mracek, General Manager

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Location detail and description of operation:

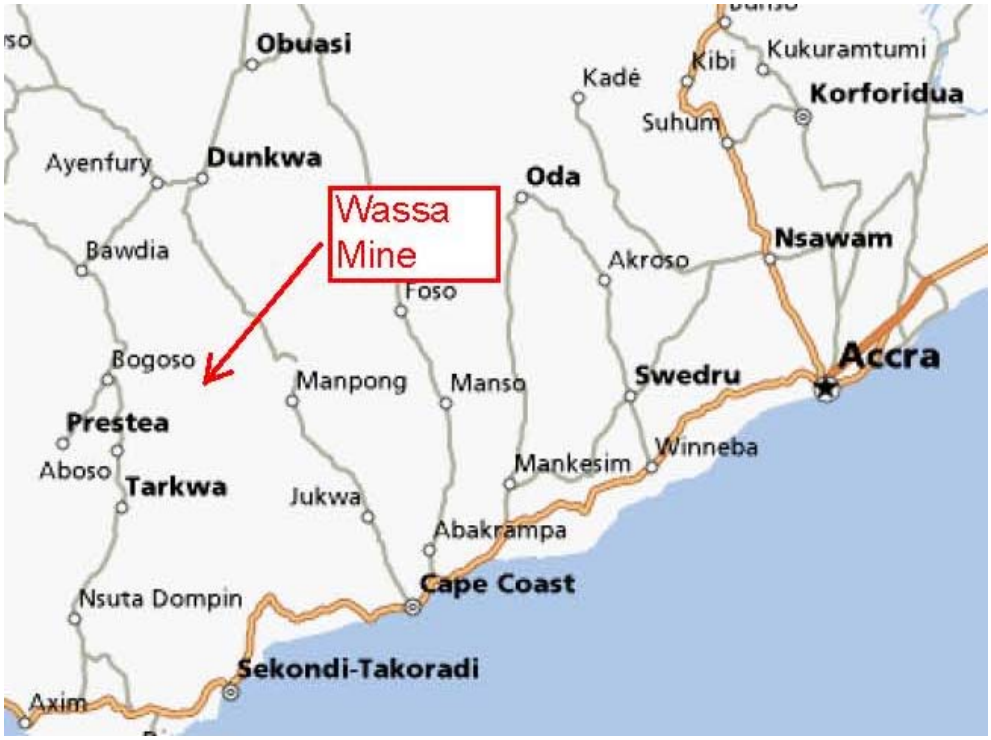
The Golden Star Resources Ltd. (Golden Star) Wassa mine is located in the Mpohor Wassa East District, in the Western Region of Ghana. The mine is approximately 80 km north of Cape Coast and 150 km west of the capital Accra.

The Wassa area has witnessed several eras of local small scale (galamsey) and colonial mining activity over the past 100 years. Wassa Mineral Resources Limited began operation of a small scale gravity circuit in 1988. They later partnered with other companies to form the consortium which began operation of the Wassa Mine and processed ore by the heap leach method. The heap leach recovery proved to be low and because of this and the lull in gold prices the mine operation ceased. GOLDEN STAR began negotiations to acquire the mine in late 2001. Golden Star owns 90% interest in the Wassa Mine, with 10% interest held by the Government of Ghana.

Since reopening the Wassa Mine ore is processed through a conventional carbon-in-leach (CIL) circuit. Ore fed to the plant is a combination of newly mined ore and material from the Phase 2 heap leach pad area, which is being excavated and processed to extract residual gold and increase the capacity of the tailings storage facility (TSF). The feed from the mill is dosed with cyanide and pumped through a 900 m long pipeline to a six stage CIL circuit, each stage comprising a 2,500 m^3 leach tank. This separation of the mill from the rest of the process plant resulted from the existing infrastructure at the plant

site area, with the crushers for the leach pad operation being located some 900 m from the Adsorbtion-Desorbtion-Recovery (ADR) recovery section, where the CIL plant was built. The 900 m long pipeline, in which the cyanided ore slurry is pumped under pressure, serves as a pipe reactor, having the same effect on the process as an additional CIL tank. The design of the TSF is a conventional saddle dam arrangement, with a starter wall at the lower end on a valley, which is gradually being raised as the levels of tailings increases.

The approximate location of the Wassa Mine is shown in the following Figure:



SUMMARY AUDIT REPORT
Auditors' Finding

The operation is:
- ☐ **in full compliance**
- ■ **in substantial compliance** * (see below)
- ☐ **not in compliance**

with the *International Cyanide Management Code.*

* The Corrective Action Plan to bring the operations noted as being in substantial compliance consists of several discrete Corrective Action Request (CAR) documents, which are included in Appendix A. All CARs must be fully implemented within one year of the date of this audit.

Audit Company: **GeoEngineers, Inc.**
600 Stewart St., Suite 1700
Seattle, Washington 98101
USA

Audit Team Leader: John Lambert
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Names and Signatures of other Auditors

Mark Montoya

Date(s) of Audit: January 19 to January 23, 2009

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the *International Cyanide Management Institute* for Code Verification Auditors. I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the *International Cyanide Management Code Verification Protocol for Gold Mine Operations* and using standard and accepted practices for health, safety and environmental audits.

LORRAINE E. JOHN
Notary Public
#204 1401 Lonsdale Avenue
North Vancouver, B.C. V7M 2H9
Phone: (604) 985-4150

Signed before me at North Vancouver B.C.
By John Lambert on 17 September 2009

A Notary Public in and for the
Province of British Columbia

Wassa Mine
Name of Mine

Signature of Lead Auditor

September 17, 2009
Date

SUMMARY AUDIT REPORT

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:

Golden Star (Wassa) Limited (GSWL) purchases sodium cyanide exclusively from the Orica Australia Pty Ltd (Orica) manufacturing plant located in Yarwun, Queensland, Australia. The Cyanide Supply Agreement between Orica and GSWL requires that the production facility complies with the International Cyanide Code. Examination of the ICMI website and evaluation of certification reports provided to GSBPL by Orica confirm the current certification status of this facility.

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:

Wassa Mine		September 17, 2009
Name of Mine	Signature of Lead Auditor	Date

The Cyanide Supply Agreement between GSWL and Orica states that Orica is responsible for the handling, storage and transport of sodium cyanide from its plant in Yarwun to the site and must comply with the provisions of the ICMC. GSWL is responsible for transport, unloading, storage, security, prevention of losses, personnel training and emergency response activities once they are in procession of the product. The responsibilities of each party are further detailed in a *Sodium Cyanide Transportation Protocol for Bogoso Gold Limited and Wexford Goldfields Limited,* prepared by Barbex Technical Services Limited (Barbex), Orica's agent and transporter within Ghana.

Orica has engaged subcontractors to provide transportation services from Yarwun to the Port of Brisbane (Toll Resources); shipping from the Port of Brisbane to the Port of Takoradi (Mediterranean Shipping Company); and transport from the port of Takoradi to a transfer facility at Tarkwa, operation of the transfer facility, and transport from the transfer facility to GSBPL (Barbex). Each subcontractor along the supply chain is either certified to the ICMC or has been verified to meet the Code through third party audits commissioned by Orica.

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 Supply Agreement states that Orica is responsible for the use, handling, storage and transport of the cyanide up to the point at which risk transfers to GSWL. The Agreement also requires Orica to comply with the provisions of the ICMC. Orica is therefore responsible for ensuring that its transportation contractors meet the Code and thereby have appropriate emergency response plans and capabilities, and that their measures for cyanide management are adequate.

Orica has provided GSWL with copies of ICMC certification audit reports, third party due-diligence verification audits, or ICMC-equivalent non-certification audit reports for each link of the transportation route between the processing plant in Yarwun, to the mine site in Ghana. These include:

- Orica Mining Chemicals, ICMC Cyanide Transportation Certification Audit, Cyanide Transportation (Northern Territory, Queensland and New South Wales) Summary Audit Report, Golder Associates Pty Ltd, dated February 2007 (this audit includes the shipment of cyanide between the Yarwun Plant and the Port of Brisbane);

- Orica Australia Pty Ltd., Third Party Code Equivalent Transportation Audit, Ghana, Golder Associates Pty Ltd, dated May 2008 (this audit included the shipment of cyanide between the Port of Brisbane and the Port of Takoradi);

- Internal Due-Diligence Assessment of Mediterranean Shipping Company, completed by Orica Mining Chemicals, April 2007 [this audit was reviewed by Golder during a third party due-diligence verification audit (see below) and found to meet the requirements of the ICMC]; and

- Barbex Technical Services Ltd, Cyanide Transportation Audit, Ghana, West Africa, Summary Audit Report, Golder Associates Ltd, November 2007; this third party due-diligence verification audit included the shipment of cyanide between the Port of Brisbane and the Port of Takoradi).

The audit reports demonstrate that Orica meets the transportation requirements of the ICMC throughout the supply chain between the production plant in Yarwun and GSWL mine site. These audits were conducted by an auditor or auditors meeting ICMI criteria. The audit reports have been approved by an ICMI-approved ICMC Lead Auditor, and all have been conducted within the previous 3 years.

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.

Discuss the basis for this Finding/Deficiencies Identified:

GSWL receives sodium cyanide exclusively as solid briquettes in one-tonne nylon supersacks, over packed in polyethylene bags (moisture barriers) and plywood pallet boxes. The boxes are stored at the solid cyanide storage facility, which consists of a concrete pad surrounded by a locked, chain link fence and covered by a metal roof. The operation has two cyanide-mixing/storage facilities, which each consist of a mixing tank and storage tank situated within a concrete containment. One facility is located at the mill and the other at the CIL plant. The facility at the CIL plant is used only as a backup to the primary facility located at the mill. Individual, locked, chain link fences surround each of the mixing/storage facilities. The solid cyanide storage facility and the two cyanide mixing/storage facilities are located within the security fence of the GSWL process facility compound which is guarded by security personnel 24 hours per day. In all cases, cyanide is stored separately from incompatible materials and reagents to prevent mixing.

Barbex delivers the boxes of solid cyanide within a steel shipping container loaded on a flatbed semi-truck trailer. During unloading, the trailer is situated next to a curbed concrete apron at the storage facility, which drains to a grated concrete containment channel. The forklift used to unload the boxes, operates on the concrete pad and the boxes are kept within the limits of the pad during the unloading process.

The cyanide mixing and storage tanks at the mill and CIL plant are situated on concrete plinths (ring beams) located within a reinforced concrete bund, which provides secondary containment. The design drawings depicting the tank foundations demonstrate that the concrete floor of the bund area extends beneath the tank foundations, creating an impermeable barrier between the tank bottoms and the ground. The cyanide mixing and storage tanks are equipped with automatic level indicators and high-level audible/visual alarms. Backup level sensors shut off inflow to the tanks at the 98 percent full level.

The design, construction, and condition of the solid cyanide storage facility and two cyanide mixing/storage facilities were examined by third party engineers, through facility inspection and review and certification of original design drawings, and found to meet the requirements of the ICMC.

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:

Wassa Mine — Name of Mine
Signature of Lead Auditor
September 17, 2009 — Date

GSWL has developed and implemented written procedures for the delivery and offloading of solid cyanide boxes; cyanide mixing; and disposal of empty cyanide containers. These procedures provide sequences for each activity, list required PPE, and require that the forklift/Telly-Handler operator has a valid operator permit. In addition, there are written procedures for clean-up of cyanide spills.

The unloading procedure specifies the transport of only one box at a time, and that boxes are stacked two high. Each procedure requires that an emergency spill cleanup box is available and equipped with necessary PPE and kits, and that a second person be available to assist.

A Daily Cyanide Mixing Safety Checklist is followed during the cyanide mixing operation. This checklist includes safety checks and operational checks to be followed before and during the mixing process. The mixing procedure also requires thorough washing of all empty liners and plastic bags; placing bags, packing straps and plastics into the empty cyanide boxes; securely placing the lids on the used cyanide boxes; placing the boxes in one of two steel locked shipping containers (ISO containers) used as temporary storage until they can be removed off-site by Barbex.

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:

GSWL has developed written management and operating plans and procedures for the cyanide facilities. These written procedures include a formal change management procedure for identifying and documenting potential risks associated with changes in the operation's processes or operating practices. The active cyanide facilities at the GSWL operation include the solid cyanide storage facility; two mixing/storage facilities (one at mill and one at CIL plant); CIL feed hopper; pipe reactor feed (PRF) pipeline; CIL plant; carbon wash circuit; elution circuit; tailings storage facility (TSF); tailings delivery, distribution, and reclaim water pipelines; process water ponds; and cyanide detoxification

system. GSWL currently operates the cyanide mixing/storage facility located at the mill, and uses the mixing/storage facility at the CIL plant only as backup. GSWL has developed and implemented operating plans and procedures for the cyanide facilities that cover safe operation and management of the facilities. These and the regulatory requirements form the basis of the facility design and operation.

The TSF is designed in accordance with the general requirements and currently accepted practices in Ghana. Knight Piésold Consulting (Knight Piésold) designed the TSF and developed the operations manual for the TSF. The TSF Operations Manual provides a description of the operating requirements, a set of clear operating procedures, a list of responsible personnel, and typical operation and contingency plans for a number of emergency situations. The primary operating objectives are to protect the environment and remove water from the tailings, thus increasing the tailings density to the maximum extent possible. This is accomplished by using sub-aerial deposition methods to form air-dried beaches and by minimizing the supernatant pond area.

The TSF Operations Manual provides the water management procedures and inspection program for the TSF. The procedures call for removing water as rapidly as possible and keeping the supernatant pond as small as possible by maintaining the depth only high enough to float the pump barge and prevent solids from being sucked into the pump. Reclaim water is transferred to the process water ponds near the CIL plant for process makeup. The inspection program provides for daily, weekly and quarterly inspections of the TSF. The inspections cover (amongst other items) tailing beach levels; supernatant pond location, elevation and depth; operation of decant pumps; pipelines; embankment integrity; seepage sumps; and water balance.

GSWL utilizes an online cyanide monitor and controller system to regulate, and minimize, cyanide addition at the CIL plant. The controller monitors plant parameters and online actual titrated cyanide values to determine the amount of cyanide that should be added to drive the plant toward a desired set point. The target concentration at the tails tank is 60 mg/l Free cyanide. In the event that Free cyanide concentrations are above this target, hydrogen peroxide is added at the tails tank launder to the tailings screen.

GSWL implements a Preventative Maintenance (PM) program and uses a software program to schedule and track maintenance work. The PM program covers weekly and monthly inspections of the reagent circuits at the mill and CIL plant, the elution circuit, the cyanide detoxification circuit, the cyanide monitor and controller system, CIL sump pumps, process water pumps and TSF decant pumps, and routine electrical inspections. The Heavy Duty Maintenance Department performs routine PM on the emergency power generators.

In addition to the TSF inspections and the PM program and inspections performed by maintenance personnel, operations personnel perform routine daily and weekly inspections of cyanide facilities. Work orders are written when issues requiring repair are identified. GSWL operations personnel perform visual inspections of the mixing and storage tanks at the mill and CIL plant on a daily basis. Daily inspections conducted at the cyanide mixing/storage facilities and weekly inspections conducted at the CIL plant, mill and solid cyanide storage facility include checking the concrete containments for available capacity and ensuring that all drains are closed. GSWL inspects the Antipollution Pond weekly for available capacity and embankment integrity. The inspections are documented on forms, checklists and work orders, which identify the inspector, observed deficiencies and nature of corrective actions. Hard copy records of the inspections are retained and PM checklists and work orders are retained on the database system.

GSWL has 13 diesel-powered generators, which provide emergency power during line outages. The generators generally power one ball mill, the CIL plant, and pumps at the TSF and process water ponds. GSWL performs hourly checks of the generators while they are operating and performs routine and scheduled electrical maintenance on the generators.

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:

GSWL processes a blend of oxide and fresh ore, mined from a number of surface pits and old heap leach pads. GSWL conducted metallurgical test work and determined that the mineralized material from the deposit was highly suitable for conventional CIL processing. The initial test work determined the expected cyanide consumption for both oxide and fresh ore.

GSWL utilizes an automated online cyanide monitor and controller to regulate and minimize cyanide addition at the CIL plant. The controller monitors plant parameters and online actual titrated cyanide values to determine the amount of cyanide that should be added to drive the plant toward a desired set point. The control system determines the amount of pulp entering the plant and adds cyanide in proportion. When pulp is not being transferred, the system stops adding cyanide.

To optimize recovery and minimize cyanide consumption, the operation aims to maintain Free cyanide concentrations at the head tank (CIL Tank No. 1) between 100 and 150 mg/l (set point). The target concentration at the tails tank is 60 mg/l. GSWL adds water at the tailings hopper to further lower cyanide concentrations in the tailings stream. Also, if it becomes critical for recovery purposes to increase Free cyanide concentrations in the circuit resulting in tails tank concentrations above 60 mg/l, then hydrogen peroxide is added into the tank launder to the tailings screen to reduce cyanide concentrations in the tailings.

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:

GSWL developed its water balance model in 2007 using Microsoft® Excel® software. The primary water management components of the GSWL operation include the TSF, process water ponds, process plant and cyanide detoxification system. The primary gains and losses to the system include precipitation; makeup and TSF reclaim water; evaporation, and seepage. The water balance model is used to evaluate conditions for 1 in 10 wet year rainfall and 1 in 10 dry year rainfall, and the TSF embankment design is based on providing capacity for a 1 in 100-year, 24-hour storm event while maintaining one meter of freeboard. The initial water balance model was calibrated using meteorological data collected over a 30-year period from the Tarkwa weather station, which is located approximately 40 kilometers from the site. GSWL currently collects meteorological data at an onsite station located at the mill. This data is collected daily and is used to update the model monthly. The TSF is operated such that it maintains adequate capacity to contain inflow from the 100-year, 24-hour storm event (300 mm) plus one meter of freeboard.

The water balance model accounts for runoff generated by precipitation from upgradient watersheds surrounding the TSF. Besides evaporation, the water losses accounted for in the model include TSF reclaim water, seepage, and the amount of water from the process water ponds that is introduced to the detoxification pond system on a monthly basis. The seepage loss from the TSF is based on soil permeability and the supernatant pond surface area.

During the wet season, the water balance at the GSWL operation is in a positive state, with the requirement to provide detoxification and discharge to surface waters. The cyanide detoxification plant consists of a series of ponds utilizing retention time and hydrogen peroxide treatment to detoxify cyanide.

The water balance model does not consider the effects of potential power outages or pump and other equipment failures. GSWL has 13 diesel-powered generators, which provide emergency power during line outages. The generators generally power one ball mill, the CIL plant, and pumps at the TSF and process ponds. In the event of a power failure, the milling and process circuits temporarily cease and water inputs stop. Pumping of slurry from the mill to the CIL plant and tailings from the CIL plant to the TSF also temporarily ceases. Therefore, no additional tailings enter the TSF.

GSWL performs comprehensive inspections of the TSF including individual daily inspections by operators, shift supervisors, and the tailings supervisor, and quarterly inspections by the design engineer. The inspections cover (amongst other items) tailing beach levels; supernatant pond location, elevation and depth; operation of decant pumps; pipelines; embankment integrity; seepage sumps; and water balance. The process personnel also monitor the integrity of the process water ponds, pipes, valves, pumps and water levels daily.

The TSF design engineer (Knight Piésold) conducts quarterly inspections of the TSF to ensure that the facility is operated safely, efficiently, and in accordance with the design intent and generally accepted good practice. In its January 2009 report, prepared for the fourth quarter inspection conducted on December 10, 2008, Knight Piésold concluded that the facility embankments were in sound condition with no evidence of any structural problems, the pond and beach levels and locations were within acceptable limits, and no abnormal seepage was occurring.

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:

GSWL does not have any open waters where WAD cyanide concentrations exceed 50 mg/l. The TSF and the process water ponds are the only facilities where process solutions are open to the environment. Water quality data reviewed for the period March

18, 2008 through November 10, 2008 demonstrate that WAD cyanide concentrations in the TSF supernatant pond ranged between <0.01 and 19.6 mg/l, while WAD cyanide concentrations in the process water ponds ranged between <0.01 and 2.75 mg/l. With few exceptions, WAD cyanide concentrations in the supernatant pond and process water ponds were <0.5 mg/l. During the same period, WAD cyanide concentrations at the tailings spigot discharges were below 50 mg/l with one exception in April 2008, whereby the sample measured 75.9 mg/l WAD cyanide. This was addressed by adjusting the hydrogen peroxide addition at the tailings hopper.

To supplement the monthly WAD cyanide analyses performed at the tailings discharge spigots, GSWL measures Free cyanide concentrations at the spigots daily. This daily sampling program, used in parallel with a conservative correlation between Free cyanide concentrations at the tails tank and WAD cyanide concentrations at the spigots, provides GSWL with the capability to rapidly and reasonably identify and respond to cyanide concentrations that are likely to exceed 50 mg/l WAD at the spigots.

Additionally, GSWL performs manual titrations at the CIL tails tank every two hours to measure Free cyanide concentrations. If Free cyanide concentrations at the tails tank are above the target value, then hydrogen peroxide is added into the tank launder to the tailings screen (in addition to the process dilution water continuously added at the tailings hopper) to lower the cyanide concentrations prior discharge to the TSF.

GSWL conducts daily inspections of the TSF and process water ponds. These inspections include monitoring for the wildlife mortalities. GSWL has not had any cyanide-related wildlife mortalities, to date.

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:

During the wet season, the water balance at the GSWL operation is in a positive state, with the requirement to provide detoxification and discharge to the receiving environment (surface waters). The cyanide detoxification plant consists of a series of ponds utilizing retention time and hydrogen peroxide to detoxify cyanide.

The EPA discharge standards for cyanide, applicable to the GSWL operation are 0.2 mg/l Free, 0.6 mg/l WAD and 1.0 mg/l Total. The operation monitors for pH, conductivity and Free cyanide downstream of the established discharge point monthly. Water quality data provided for 2008 (March 18 through November 10) demonstrate that WAD cyanide levels at the two surface water monitoring points directly downstream of the cyanide detoxification pond system, were all below the detection limit of 0.01 mg/l. Additionally, data provided for the same period show that Free cyanide levels were below 0.022 mg/l on all occasions, demonstrating that GSWL is also meeting the ICMC in-stream surface water standard for aquatic life.

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:

The TSF is an unlined facility and the embankments are designed with upstream and downstream toe drains to collect and convey seepage to sumps. The water collected in the seepage sumps is returned to the TSF impoundment or to the process water ponds. GSWL conducts daily inspections of these sumps and collects monthly samples for Free cyanide analysis.

As previously discussed, GSWL performs comprehensive inspections of the TSF including individual daily inspections by operators, shift supervisors, and the tailings supervisor, and quarterly inspections by the design engineer. The inspections cover (amongst other items) tailing beach levels; supernatant pond location, elevation and depth; operation of decant pumps; pipelines; embankment integrity; seepage sumps; and water balance. The TSF operations manual specifies that the ponds be maintained as small as possible in order to minimize seepage from the facility, maximize the flood absorption capacity of the facility, and maximize the area available for drying and consolidation of the tailings.

The downgradient use of groundwater and surface water is primarily agriculture plus domestic (including drinking) at the Kubekro community. The Ghana EPA does not have a regulatory limit for cyanide in groundwater and there is not a designated beneficial use (set by EPA or other regulatory agencies) for groundwater downgradient of the site.

GSWL monitors eight onsite groundwater wells and two groundwater wells located at the Kubekro community. The onsite monitoring wells are installed downstream of the TSF

embankments to enable sampling and analysis of the receiving groundwater regime. The eight wells are sampled monthly at four separate locations. Each monitoring location has a shallow well and a deep well. As a regulatory requirement, GSWL submits monthly monitoring reports to the EPA and Inspectorate Division of Minerals Commission, and quarterly reports to the Water Resources Commission. These reports include all water quality data (i.e., surface water and groundwater) monitored on and off site.

The onsite wells are not used as a drinking water supply; however, the EPA requires monitoring to ensure no contamination is occurring. Therefore, GSWL monitors cyanide at these wells against its internally established numerical guideline of 0.022 mg/l Free cyanide. Because the two wells at the Kubekro community provide a supply of drinking water, GSWL is required to monitor quality against the Ghana Standards Board (GSB) and the Ghana Water Company Limited (GWCL) drinking water guideline for cyanide (0.01 mg/l Free cyanide). The GSB/GWCL guideline for cyanide applies to any water (surface water or groundwater) that is supplied as drinking water.

Monthly groundwater quality data provided for 2008 (March 18 through November 10) demonstrate that WAD cyanide concentrations at all eight onsite monitoring wells were below the detection limit of 0.01 mg/l except on one occasion in which the October WAD cyanide concentration was 0.16 mg/l at a single well MB-03A. WAD cyanide concentrations reported for November and December were below the detection limit of 0.01 mg/l. Quarterly monitoring results for 2008 demonstrate that Free cyanide concentrations at the two Kubekro wells located at the downgradient Kubekro community were below drinking water guideline of 0.01 mg/l, ranging between 0.001 and 0.006 mg/l for the year.

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:

GSWL has implemented spill prevention and secondary containment measures for all cyanide mixing, storage and process solution tanks. Additionally, GSWL has constructed pipelines with spill prevention and containment measures to collect leaks and prevent releases. Single-walled pipelines are either located within concrete or lined containment, or are above ground where they can be visually inspected as described below. To supplement the secondary containment structures, GSWL has implemented procedures to prevent releases to the environment from process solution pipeline leaks or ruptures.

GSWL uses steel, rubber-lined steel, HDPE, and PVC primary containment pipelines for conveyance of cyanide solutions and slurries. Cyanide mixing, storage and process tanks are steel. These materials are compatible with cyanide and high pH solutions.

The cyanide mixing and storage tanks at each of the two cyanide mixing/storage facilities are situated on concrete plinths (ring beams) located within a concrete bund, which provides secondary containment. The design drawings depicting the tank foundations demonstrate that the concrete floor of the bund area extends beneath the tank foundations, creating an impermeable barrier between the tank bottoms and the ground. Within each concrete containment facility, a sump with an automated pump returns any collected solution to the mix tank or storage tank.

The CIL feed hopper located at the mill is situated within a concrete bund with a sump and automated pump, which returns any collected slurry back to the process circuit. Additionally, this bund is hydraulically linked (via a concrete channel) to the geomembrane-lined Antipollution Pond, which provides tertiary containment. GSWL has implemented written procedures for the removal of precipitation and spillage collected in the Antipollution Pond.

At the process plant, six CIL tanks are also situated on concrete plinths (ring beams) located within a concrete bund. Additionally, GSWL has constructed two ring foundations for future expansion of the CIL circuit, and the foundations do not currently have tanks mounted on them. Design drawings demonstrate that the ring beam foundations do not provide an impermeable barrier between the tank bottoms and the ground. Refer to CAR **GSWL-ICMC-CAR-01** in Appendix A. The ring beam detail shows that the foundations have a 50-mm thick concrete blinding beneath the beam; however, the blinding does not extend across the center area of the foundation footprint. The center area within the foundation footprint is compacted "well graded selected material" topped with a 40- to 100-mm thick bitumen/sand mix layer (with no underlying concrete).

Prior to the onsite audit, GSWL had interpreted the drawings to imply that the bitumen/sand mix layer and underlying compacted soil foundation provide an impermeable barrier between the tank bottoms and the underlying ground. Nevertheless, GSWL has prepared design drawings and developed a scope of work for installing leak collection and recovery systems within the CIL tank ring foundations to allow for identification of any leakage prior to it entering the environment. GSWL provided copies of the design drawings and work plan as well as written correspondence stating that the engineer assigned to perform the work is scheduled to be on site to begin installing the systems on September 16, 2009. The CIL tanks are relatively new (constructed in 2004) and recent thickness testing conducted on the tank walls demonstrate that they are in good condition. Additionally, GSWL inspects the tanks daily for presence of leaks and signs of corrosion. Therefore, based on these measures, no immediate or substantial risk

to health, safety or the environment is deemed to exist during implementation of this CAR.

The carbon wash and elution circuits are also contained within a concrete bund. The bunded area has dedicated sumps with pumps for returning solutions and slurries back to the process circuit.

The concrete bund containments for each of the cyanide mixing storage facilities, the CIL feed hopper, the six CIL tanks and the acid wash and elution column each have sufficient volume to contain greater than 110% of the volume of the largest tank within each bunded area. Each of the containments has dedicated dedicated sumps and pumps to remove cyanide solutions for return to the process circuits.

At the mill, where the PRF pipeline leaves the CIL feed hopper bund, a steel gantry supports the rubber-lined steel pipe overhead across the ore crushing area, facilitating visual inspection. If a major leak or failure of the PRF were to occur, the pumps would trip on overload in three to five minutes, resulting in approximately 30 to 35 m^3 of spillage, which in this area would be mechanically removed and/or naturally flow into the mill Antipollution Pond (a geomembrane-lined secondary containment pond) if assisted by a simultaneous stormwater event. Once the PRF leaves the crushing/mill site, the pipeline becomes HDPE and is contained within a geomembrane-lined channel alongside the road between the mill site and the CIL plant. Lined catchment basins with automatic sump pumps are linked to the containment channel and are located near the mill (at the low point of the channel) and at the CIL plant. Any slurry collected in these catchments is pumped to the CIL bund containment. If excessive spill inflow or pump failure causes the catchments to reach capacity, the mill feed automatically terminates via an interlock system. Near the CIL plant, the PRF converts back to a rubber-lined steel pipeline at the point where it leaves the geomembrane-lined channel and crosses overhead, via a steel gantry, into the CIL bund area. Any leakage from this pipe segment would fall onto the road below and flow (via manually opening the valve on a drainpipe) into the concrete bund area provided for the CIL tank farm. Flange covers are provided along the PRF at high activity work areas and where the pipeline crosses outside of geomembrane-lined or concrete secondary containment.

A short section of the PRF pipeline crosses over a natural drainage, which discharges directly to the receiving environment. The segment of pipeline crossing the drainage is constructed of rubber-lined steel, with covered flanges and is wrapped with HDPE geomembrane liner. The geomembrane is welded closed to form a pipe sleeve and extends beyond the drainage catchment area on one side of the drainage channel and into the geomembrane-lined secondary containment channel for the PRF on the other side of the drainage channel (approximately 10 meters beyond the drainage channel on either side). By design, the pipeline slopes towards the lined secondary containment basin

provided for the lined PRF containment channel. Any leakage collected by the pipe sleeve would report to this catchment basin.

A steel gantry supports the HDPE tailings delivery pipeline from the point it leaves the CIL plant bund area to a point where it enters a geomembrane-lined containment channel. Any leakage from the overhead section of the pipeline would fall onto the road below and flow into the concrete channel alongside the road for conveyance to the process water ponds. The geomembrane-lined containment channel drains to the process water ponds via lined interceptor channels and/or the concrete channel alongside the road at the CIL plant. The tailings delivery pipeline is contained within the geomembrane-lined channel to the point it reaches the TSF, where it is buried under a road for a very short distance before reaching a wye valve within the impoundment. At the wye valve, the delivery pipeline branches into two distribution pipelines placed on the inside embankment slopes of the impoundment. During the onsite verification audit, the audit team requested that GSWL provide documentation demonstrating that leakage detection and recovery is provided for the portion of the tailings delivery pipeline that is buried near the TSF. Refer to CAR **GSWL-ICMC-CAR-02** in Appendix A. The HDPE tailings delivery pipeline is buried at a shallow depth for a very short distance and at a location that is inspected daily. Additionally, this particular section of pipeline is scheduled to be relocated to accommodate a planned raise of the TSF embankment, and subsequent to the onsite audit, GSWL provided photographs of the pipeline segment exposed. Therefore, based on these measures and the procedures that GSWL has implemented for responding to potential cyanide releases and spills, no immediate or substantial risk to health, safety or the environment is deemed to exist during implementation of this CAR.

The two polyvinyl chloride (PVC) tailings reclaim (return water) pipelines also run along the inside embankment slopes, except for the pipeline section between the impoundment and the process water ponds. In this segment, the two pipes run side-by-side along the ground surface and within unlined earthen berms. Any leakage from this section of the pipeline (which contains reclaim water with very low cyanide concentrations) would be contained within the berms and/or would flow to the process water ponds.

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:

Wassa Mine		September 17, 2009
Name of Mine	Signature of Lead Auditor	Date

During the onsite verification audit, GSWL provided the following reports, documenting implementation of quality assurance/quality control (QA/QC) programs related to certain construction phases of the TSF; however, QA/QC documentation was not provided for the other stages of construction of the TSF or for the remaining active cyanide facilities.

To supplement the original QA/QC documentation available, GSWL commissioned Topsky Ventures and Knight Piésold in 2008 and 2009 to perform various inspections that encompassed all the necessary components of the remaining active cyanide facilities at the Wassa operation.

In February 2008, Topsky Ventures conducted visual inspections and ultrasonic wall thickness testing on the mixing, storage and CIL tanks. All tanks were found to be in good condition. In November 2008, Topsky Ventures also conducted visual inspections and ultrasonic wall thickness testing on the cyanide slurry pipelines at the mill and the CIL plant. The inspection identified one section of the feed line, from the PRF pipeline to CIL Tank No. 2, with weak wall sections. GSWL replaced the weak pipe section in January 2009. Field inspection and review of maintenance records during the onsite verification audit provided confirmation.

The TSF design engineer (Knight Piésold) conducts quarterly inspections of the TSF to ensure that the facility is operated safely, efficiently, and in accordance with the design intent and generally accepted good practice. These inspections include a visual inspection of the TSF embankments for structural integrity and evidence of abnormal seepage. In its January 2009 report, prepared for the fourth quarter inspection conducted on December 10, 2008, Knight Piésold concluded that the facility embankments were in sound condition with no evidence of any structural problems, the pond and beach levels and locations were within acceptable limits, and no abnormal seepage was occurring.

Additionally, in February 2008, Knight Piésold conducted visual inspections of the concrete containment bunds at the two mixing/storage facilities, the solid cyanide storage facility and the CIL tank farm. The inspections were conducted to assess the structural integrity and capacity of the containments. Knight Piésold found the concrete containments to be in relatively good condition.

In March 2009, Topsky Ventures conducted a combination of visual inspections and ultrasonic wall thickness testing for the additional cyanide facilities not covered by the original inspections. The inspections and testing covered the cyanide mixing and dosing tanks; CIL feed hopper; acid wash cone; acid column; strip solution tank; elution column; tailings delivery, distribution and reclaim water pipelines; tailings hopper; HDPE process water pipelines; process water ponds (four); detoxification ponds (four); antipollution ponds (two); supports and piping related to cyanide facilities, including steel gantry supports; and concrete bund walls, foundations and floors at the CIL tank farm and solid

cyanide storage facility. The report issued by Topsky Ventures recommended that GSWL complete various corrective actions to remedy deficiencies identified by the inspections regarding the CIL feed hopper, the process water ponds, and the antipollution pond located near the laboratory. Topsky Ventures, issued a subsequent report, dated August 24, 2009, verifying and certifying that the recommended corrective actions listed in its March 2009 report have been properly implemented to resolve the identified deficiencies. The Topsky Ventures certification report states that the facilities are in good working condition and can be used for their intended purposes.

The Knight Piésold and Topsky Ventures personnel that performed the inspections described above are all qualified engineers.

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:

GSWL has prepared and implemented written standard procedures for monitoring activities to evaluate the effects of cyanide use on wildlife, surface water quality and groundwater quality. The GSWL surface water and groundwater monitoring plans provide procedures for calibration of field equipment, purging (for groundwater) and sampling procedures; field log keeping, sample management (including chain of custody procedures), quality control, analysis methods and data management. Sample locations and frequencies, and monitoring parameters, cyanide species and summarized on an Environmental Monitoring Matrix. Field measurements recorded include the date, time, sampling location, stream flow, rainfall (within 24 hours), pH, temperature, and conductivity.

GSWL monitors for cyanide in discharges to surface at two locations; at the process water ponds where tailings reclaim water is collected, and at the Antipollution Pond near the mill. GSWL also monitors surface water and groundwater for cyanide at six downgradient surface water locations, four downgradient groundwater locations and five TSF seepage sumps. In total, eight monitoring bores (two deep wells and two shallow wells at each monitoring location) are installed downgradient of the TSF embankments to enable sampling and analysis of the receiving groundwater regime.

Wildlife monitoring is integrated into the daily inspections performed at the TSF. Wildlife observances are documented on the TSF Daily Inspection Sheet completed by the Tailings Supervisor. GSWL has a procedure for monitoring wildlife mortality, including recording and reporting mortalities, sampling water for pH and Free cyanide near mortality locations, identification of species, examination of dead specimens, and preservation and shipment of specimens to an accredited laboratory for analysis. To date, GSWL has zero recorded wildlife mortalities.

The sampling and analytical protocols provided in the GSWL surface water and groundwater monitoring procedures were developed by appropriately qualified personnel. GSWL conducts monitoring at frequencies adequate to characterize surface water and groundwater quality and wildlife mortalities.

***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:

A Provisional Decommissioning Plan for the mine, dated December 2004, was developed based on Ghana's Mining and Environmental Guidelines which requires nomination of end uses of all lands affected by the mining project; nomination of the end uses of all buildings and other infrastructure; description of the fate of all fixed equipment; description of the steps to make the area safe; description of how public access will be managed after mine closure and description of the type and duration of post decommissioning monitoring. With regards to cyanide facilities, the Plan addresses the closure of the TSF, disposal of process chemicals, and decontamination and demolition of plant and administration buildings. The Plan and associated cost estimate formed the basis for the Reclamation Security Agreement between GSWL and EPA.

After becoming a signatory to the ICMC, GSWL developed a Cyanide Facility Decommissioning Plan (CFDP). The CFDP describes in detail the proposed activities

and provides a conceptual decommissioning schedule. Decommissioning activities include disposal of residual cyanide reagents; rinsing of cyanide facilities including pipelines, pump, tanks and other vessels; and installation of measures necessary to control or manage surface or groundwater including pump and treat systems as required during the facilities closure period. The CFDP represents a base document that GSWL has committed to review and update annually.

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:

GSWL is required to post security with EPA Ghana to cover the mine closure costs. The cost estimate to perform the work described in the October 2004 Provisional Decommission Plan was submitted to EPA Ghana as part of the Environmental Impact Statement for the Wassa Project, dated 12 December 2003. The costs included decommissioning of the plant and reduction of tailings pond water to a minimum, with water discharges to meet Ghana's Effluent Quality Guidelines. The costs were based on Golden Star undertaking the decommissioning activities and did not include third party contractor costs. The decommissioning plan and cost estimate were reviewed and approved by EPA Ghana and used for establishing the Security Agreement with Wexford Goldfields Ltd, dated 15 February 2005. The cost estimate also included a provision for decommissioning the former heap leach pad. The leach pad is, however, being actively mined to reprocess the ore through the CIL plant. To date approximately 70% of the leach pad has already been mined.

In September 2008, GSWL applied to EPA to renew its reclamation agreement and has been since revised the Decommissioning and Reclamation Plan and cost estimate. The revised cost estimate provides sufficient funding for a third party contractor to undertake the work. The cost assumptions used were based on unit rates provided by Golder Associates, Ghana, who recently completed a third party closure cost estimate for Golden Star's Bogoso/Prestea mine, and includes a markup on costs to allow for a third party contractor costs. This decommissioning and reclamation plan was included in the EMP submitted to the EPA. This document is being reviewed by EPA and a new Security Agreement negotiated with GSWL. GSWL will review the Security Agreement with EPA every 3 years.

A current Reclamation Security Agreement (15 February 2005) between GSWL and Ghana EPA is provided through a combination of a bank guarantee (Barclays Bank) and a cash deposit. The guarantee and bond values more than cover the estimated costs for decommissioning all of the cyanide related facilities.

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:

GSWL have documented standard operating procedures located on their intranet. These include procedures that address sodium cyanide unloading, mixing, plant operations, entry into confined spaces and equipment decontamination

These procedures specify the minimum PPE required and provide pre-work instruction which includes checking equipment and work conditions prior to starting an assignment. Checks include, depending on the task, ensuring personnel are trained for the task; monitoring HCN gas; inspecting PPE equipment; testing eye-wash and shower operation; and checking correct positioning of flow valves and condition of tools and other equipment. Procedures include requirements for Safe Work Permits or Confined Space Entry Permits. These have pre-work checks, hazardous assessment, and PPE requirements etc; and must have sign-off by a supervisor prior to being issued.

GSWL have also recently developed a documented Change Management procedure that is tracked through the Safety Department. The procedure provides a formal process whereby sign-off by representative users; department supervisors and superintendent; and environmental, safety department officers and ultimately by the Metallurgical Manager is required before a change can be implemented.

A number of forums are available where workers are encouraged to provide input to developing and evaluating health and safety procedures. These include pre-shift (toolbox) meetings, daily safety talks, and monthly departmental safety meetings. There is also an opportunity for workers to provide input during a monthly house-keeping

competition promoted by GSWL. The workers union representative attends monthly central safety meetings where safety issues are tabled to mine management.

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:

Procedures are in place to ensure that process solutions are maintained at pH > 10 to prevent the evolution of HCN. Operators monitor the pH of each CIL tank every one to two hours and add lime as required to maintain the pH >10. Signs are posted at the cyanide dosing point location in to notify operators to maintain pH>10. The pre-mix water is adjusted to pH>12 prior to adding cyanide to the mix tank.

Workers that may be exposed to hydrogen cyanide (HCN) gas or cyanide dust while undertaking critical tasks are required to carry portable HCN monitors and wear appropriate PPE. Procedures specify the type of PPE required when undertaking a given task. Workers are trained in the use of personal monitors and PPE including the use and maintenance of full face respirators with suitable cartridges. GSWL has also trained personnel to use self-contained breathing apparatus (SCBA) equipment recently acquired for use in the event of an emergency.

GSWL has identified areas where there is a potential for HCN generation. HCN concentrations in these areas are monitored daily by operators and recorded in the shift logbook so that trends can be evaluated and process adjustments made as necessary. As stated above, operations and maintenance workers are required to use personal HCN monitors when working in areas or on tasks where there is a potential for exposure to HCN gas or cyanide dust. Procedures are also in place that specify actions to be taken when elevated HCN concentrations are detected. Fixed hydrogen cyanide (HCN) monitors are located at the areas of the plant where there is a potential for HCN generation. These areas are the mill mix plant, CIL feed hopper, tailings hopper, carbon safety screen, CIL mix plant, and above CIL Tank #1. All six monitors provide a digital readout of HCN concentration and have visual and audible alarms set to alarm at 4.7 ppm and 10 ppm. The fixed and personal monitors are calibrated by Barbex in Tarkwa. Calibration records show that calibration of all the monitors is current.

Signs are well posted throughout the facility to warn workers when cyanide is present. Cyanide warning signage is prominently displayed on fencing surrounding the mix tanks and cyanide storage operations; along the PRF pipeline corridor; around the TSF; and at the mill and CIL cyanide dosing tanks. The cyanide mix and storage tanks are labeled as containing cyanide and cyanide piping at the mill and CIL plants is colour coded purple are have flow direction arrows. In addition, the CIL tanks are prominently labeled as such and the plant is well signed to show required PPE and HCN danger signs are posted in areas where there is a potential for elevated concentrations of HCN gas. Although no eating, no drinking, and no smoking signs were not prominent, this was not considered significant because workers have been trained to follow this requirement.

Shower/eyewash units are installed at strategic locations around the plant in areas where cyanide is used. The units are inspected weekly during process plant and cyanide storage area inspections and also tested prior to cyanide unloading or mixing. The water supply to the eyewashes is regulated at a safe operating pressure of about 30psi.

All fire extinguishers located in areas where cyanide may be stored or handled are dry-powder non-acid type extinguishers. The extinguishers are inspected monthly and are sent out to a qualified service company in Tarkwa semi-annually for maintenance.

Material Safety Data Sheet (MSDS) training is provided to all new employees as part of General Cyanide training. MSDS for sodium cyanide is also posted in strategic areas of the plant including the mixing areas and cyanide storage building. There are also "Safety Instructions for Handling Cyanide" boards posted at the CIL plant, mixing plants and the cyanide storage building. The primary language of the workforce is English and all procedures, MSDS, safety instruction boards, and worker training is provided in English. As a small number of workers are illiterate, hazards associated with cyanide are regularly provided verbally to workers during pre-work meetings. Hazards and safety precautions are also in the form of pictorial signage showing required PPE prominently posted around the plant. First aid procedures are also provided in the Sodium Cyanide Emergency Response Plan (SCERP).

GSWL has a documented procedure for investigating and reporting safety related incidents. All incidents must be reported immediately to the supervisor, who is responsible for completing the incident reporting form. Incident investigations are undertaken immediately after the reporting of the incident. Where necessary a team comprising two or more will complete the investigation. Based on the findings of the investigation, a Corrective Action Request Form is completed. To date, GSWL has had no cyanide related safety incidents.

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.

Summarize the basis for this Finding/Deficiencies Identified:

Shower /eye-wash units are located at strategic areas of the plant where cyanide is handled. Oxygen resuscitator kits are located in the ambulance, emergency response stores, plant office, safety block and clinic. Cyanide antidote kits are located in refrigerators at the clinic, environmental laboratory and training building. The expiry dates of the kits were inspected and found to be current. The oxygen resuscitator kits, antidote kits and emergency response equipment are inspected twice monthly.

GSWL has developed a SCERP to respond to cyanide leaks and spills. The Plan describes the standard procedures to be followed in the event of an unplanned release of cyanide from its operations. The plan includes initial response, first aid and emergency response for various possible emergency scenarios. In the event of an emergency at the plant workers can communicate through use of the plant radio system or portable radio. Workers carry radios when in the tailings area. Supervisors and managers are also provided with cell phones. All workers receive General Cyanide training which includes: potential hazards of cyanide; symptoms of cyanide exposure, cyanide first aid, and use of oxygen resuscitators. ERT members have completed amyl-nitrite training as part of Cyanide First Aid training and GSWL intends to train all remaining workers.

GSWL has contracted Crusader Health Ghana Limited/Medical Services International for on-site medical services. The contract specifically includes services for treatment and stabilization of persons exposed to cyanide. The clinic is located in Camp 2, about 1.5 km from the plant entrance. Resident clinic staff includes one doctor and five nurses. In the event of a cyanide emergency, the doctor or nurse, as well as a vehicle and driver, are available on 24 hr call out. Sodium thiosulphate antidote is available at the clinic and plant site if required to be administered by the doctor.

An ambulance is on standby 24 hrs a day at the main office security gate if required. The ambulance is equipped with medical oxygen. The nearest hospital is ABA Hospital in Tarkwa, located approximately 2 hrs drive from the plant. The Crusader contract indicates that a nurse will travel in the ambulance with the trauma patient to the hospital. The Hospital is operated by the same company as the clinic and is well prepared to treat cyanide trauma patients.

Wassa Mine		September 17, 2009
Name of Mine	Signature of Lead Auditor	Date

The SCERP requires that mock drills are conducted at least twice a year. Three mock drills involving cyanide have been completed since February 2008. The emergency drill report completed during these exercises provides a description of the drill, response times, response performance and shortcomings, and a corrective action plan to improve response planning from the lessons learned.

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:

GSWL has developed a SCERP specific to the Wassa site to respond to emergency situations involving cyanide. The plan includes initial response, first aid, and emergency response actions to be followed for various possible emergency scenario including solid cyanide spill on land and wet areas; spillage of tailings slurry from pipe/tank rupture; transportation emergency involving sodium cyanide; power failure; explosion (fire); tailings storage facility emergency; overtopping of ponds/impoundments; and cyanide poisoning. Emergency response in the event of a tailings dam failure is also addressed in the Tailings Storage Facility Operating Manual. The SCERP clearly sets out responsibilities of workers, managers and emergency response personnel.

Bartex is responsible for responding to transportation emergencies related to cyanide up to the delivery point where responsibility is transferred to GSWL. The Barbex Cyanide Transportation Protocol addresses the physical and chemical form of cyanide, the transportation method and vehicles used, the routing and road conditions, and emergency response procedures. GSWL has agreed to be available to coordinate initial response and provide assistance in the event of an emergency occurring near the mine site. GSWL has also taken the initiative to communicate and train communities that may be affected if a transportation incident occurred. Community leaders have been trained to immediately inform GSWL and to prevent curious observers going near the site.

The SCERP provides specific response activities and responsibilities for various emergency scenarios including evacuation, isolation and control of spillage,

communication with outside agencies and detoxification and clean-up. The SCERP also provides information on health hazards associated with cyanide exposure, first aid procedures, location and contents of emergency kits, and clean-up and decontamination procedures.

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 SCERP was developed with input from key personnel in the safety and ICMI departments. The procedure is updated on an annual basis or as appropriate to incorporate lessons learned from an incident or mock drill. Stakeholders and communities have been provided with cyanide emergency response training and community leaders have been provided with first response telephone numbers in the event of a cyanide related incident.

GSWL has provided cyanide awareness training to community members (opinion leaders, teachers and school children) that has included information on the emergency response actions that the mine and transportation company would take in the event of a cyanide incident and responsibility of the community to report emergencies and to stay clear if such an incident occurred. Community representatives have also been invited to observe a mock drill involving a transportation incident with a cyanide spill.

GSWL has a formal arrangement with the Tarkwa Fire Service and Akyempin Police Department to provide emergency response services support in the event of an emergency. Specifically the Fire Service has agreed to standby and support the emergency response team in fire-fighting in the event of a fire outbreak including a fire involving cyanide. The Police Service has agreed to provide crowd and traffic control and take care of emergency response equipment in the event of an off-site incident. The Fire Service has been provided a tour of the plant and is familiar with the chemical used and general storage locations.

Golden Star Resources has a contract with Crusader Health Ghana Limited to provide medical services, including the treatment and stabilization of persons exposed to cyanide and, when required, the referral of patients to ABA Hospital (a Crusader Health facility) located in Tarkwa. The medical clinic located at the Camp 2 is staffed by a doctor and five nurses. An ambulance and trained driver available 24 hrs /7 days a week located at

the Main Security Gate. Two of the nurses have undertaken cyanide emergency response training and in the use of PPE in the event of a cyanide emergency at the plant.

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 CERP provides 24 hr emergency call phone numbers of managers with designated emergency response responsibilities in the event of an emergency. The Plan also lists responsibilities of supervisors and workers related to reporting communication during emergencies, evacuation and equipment shutdown. There is always an emergency response team crew on call at the plant. The contact list is maintained by the Health & Safety (HS) Superintendent and an updated list is maintained by security communication control centre. The CERP also defines the duties and responsibilities of Emergency Response Team (ERT) members, employees, supervisors and managers. These responsibilities include contacting outside regulatory agencies, police and fire services; community representatives, Orica/Barbex and Golden Star corporate, depending on the type of incident. The responsibilities of the Medical Centre Clinic are provided in Crusader's Contract with GSBPL.

The CERP includes an inventory of the emergency equipment available and where it is located. The emergency response equipment is checked twice monthly to ensure they are complete and maintained in the event of an emergency.

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 SCERP provides an emergency response contact list for designated managers responsible for making contact with given stakeholders. As described in the plan the

discoverer immediately calls the control room and/or his/her supervisor to report the situation. Security Control will then contact the emergency coordinator and senior management as necessary and mobilize the ERT and medical clinic. The Human Resources /Administration Manager is responsible for contacting relevant community representatives. The Senior HS Officer and Security Superintendent are responsible for contacting police and fire service if required. The Metallurgical Manager, Maintenance Manager and HS Superintendent have authority for approving outside assistance if requested by Barbex. The HS Superintendent is responsible for notification outside regulatory agencies.

The SCERP provides a call list of community representatives and contact information in the event of an emergency. The Human Resources/Administration Manager is responsible for contacting the relevant community representatives and media at the approval of the Metallurgical Manager.

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 SCERP provides emergency response procedures and responder responsibilities for different cyanide emergency scenarios. These scenarios include response to a solid cyanide spill on land and into wet lands, as well as liquid cyanide spills. GSWL has procedures for clean-up and decontamination for wet and dry spills. These include methods to neutralize cyanide impacted soil and liquid waste and management and disposal of such wastes. In situations where there is a potential for water impact the Human Resources/Administrative Manager is responsible for arranging water tankers or alternative potable water supply to impacted communities.

The SCERP and operating procedures dealing with clean-up of cyanide spills prohibit the use of chemicals including sodium hydrochlorite, ferrous sulphate and hydrogen peroxide to treat cyanide if there is a potential to impact a surface water body.

The SCERP requires that an area impacted by a cyanide release is investigated after an emergency to ensure that the area has been adequately cleaned. The investigation would include collection of water samples along channels affected by a spill into wet lands and

confirmatory soil sampling following clean-up of a spill on land. Sampling procedures include sampling method, analysis method, QA/QC, and shipping and handling. The Environmental Superintendent is responsible for developing mitigation methods for clean-up, designing investigation and monitoring programs, and confirmation that the area has been satisfactorily cleaned up.

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 SCERP includes review procedures that require the plan to be reviewed at least once a year under normal operations procedures; whenever an incident or a mock drill reveals a procedural shortcoming; when there is a new technology, process, equipment or training method available to the mine; and when there is a structural or physical alteration or layout change. The HS Superintendent is responsible to ensure that the SCERP is updated as required. The weekly ICMI meeting provides a forum where proposed changes to the SCERP are discussed and approved. The SCERP was last reviewed in March 2009.

The SCERP requires that mock drills are conducted at least twice a year. Since January 2008, three mock drills have been completed that involved cyanide exposure incidents. As part of the drill a mock drill report is prepared that provides a description of the drill, response times, participants, response performance and shortcomings, and a corrective action plan to improve response planning from the lessons learned. The corrective action plan log lists the action to be taken, the responsible person, the due date and date of completion.

The HS Superintendent is responsible for ensuring that the SCERP is reviewed after the occurrence of an accident or emergency incident. To date there has been no cyanide related emergency so such a review has not been undertaken.

***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:

All visitors, contractors and new employees entering the plant are required to complete induction training to inform them of GSWL policies, procedures and site safety (signage, PPE requirements, and emergency response). The induction includes cyanide awareness for visitors that enter areas where cyanide may be present.

All new employees are also required to complete General Cyanide training. This training includes recognition of cyanide; hazard of cyanide, safe handling; PPE, symptoms of cyanide exposure and poisoning, and emergency response procedures including first aid in the event of exposure to cyanide. Workers that perform cyanide related tasks are also required to complete specific training on operating procedures that relate to specific cyanide management tasks before assumption of duty. The cyanide training is provided by a GSWL trainer that has completed the Orica train-the-trainer cyanide course. Employees complete General Cyanide refresher training every 6 months.

Training attendance sign-off sheets and completed test sheets are retained by the trainer. Training records are also tracked on an Excel® spreadsheet that details, for each employee, the minimum training requirements for the operating area and tasks the worker is assigned, and the date the training was completed.

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:

Employees that perform cyanide related tasks are required to complete task specific training on the operating procedures related to that task. Training in operating procedures is provided by the Plant Supervisor/Department Trainer. Training records are maintained through completion of attendance sheets and tracked through an Excel® Training Matrix which provides the specific training elements (operating procedures) required by a worker for a given work area. Task specific refresher training is completed every 6 months or sooner if there is a change in operational procedure. Employees are not permitted to perform cyanide related work tasks without first completing task specific training. Participants of general cyanide training and refresher training are required to pass a written test to evaluate the effectiveness of the cyanide training. Those that fail are required to be retrained until they meet the required pass mark. GSWL is planning to introduce a similar test program for task specific training. Worker competence is also evaluated through task observations although the procedure is currently informal.

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.

Describe the basis for the Finding/Deficiencies Identified:

All employees complete General Cyanide training and refresher training every six months. This training includes recognition of cyanide; safe handling of cyanide; health effects of cyanide; symptoms of cyanide exposure and poisoning, emergency response procedures, and first aid (including use of oxygen resuscitator and amyl-nitrite kits) in the event of exposure to cyanide. A number of plant operators are also ERT members and have completed Emergency Response training.

The emergency response team (ERT) is made up of operators and maintenance personnel from the Metallurgical department and security personnel. ERT members have completed Emergency Response Plan training, Basic Fire Fighter training, First Aid (including cyanide first aid), Casualty Management, Incident Management and Oxygen Resuscitator training. Emergency Response refresher trained is scheduled to be completed annually by ERT and emergency coordinators. In addition the ERT undertake classroom role acting training in the use of PPE, first aid, decontamination training for various emergency response scenarios.

As discussed in Section 7.6, the SCERP requires that mock drills are conducted at least twice a year. Since January 2008 three mock drills have been completed that involved

cyanide exposure incidents. In addition to mock drills, members of the ERT also participate in an annual National emergency response competition which provides an opportunity to sharpen emergency response skills and transfer ideas with responders from other companies.

The Community Relations Section (CRS) is actively engaged in community outreach programs that include training communities on the nature, hazards and use of cyanide, and actions the community should take in the event of an emergency that involved cyanide. These programs have been provided to chiefs and opinion leaders of communities located along the cyanide transportation corridor; representative teachers and students from schools in the catchment area; and local law enforcement officers. One of the training sessions involved community observation of a mock drill of a vehicle accident and solid cyanide spill.

***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:

The CRS is the primary point of contact for all external inquiries regarding cyanide-related issues. The community or stakeholders may communicate with GSWL by visit, telephone, fax, letter, email or direct contact in the field with a GSWL employee or contractor. CRS is responsible for responding to inquiries and complaints, and monitoring communications and progress of any approved mitigation measures or redress. Communications are recorded and tracked in a register by the Senior Community Consultation Officer. The registry provides a record of the issue, summarizes the action taken, and notes the action completion dates. No cyanide related issues were received in 2008.

GSWL undertakes a wide range of community outreach efforts including scheduled meetings and training forums. Quarterly Community Mine Consultative Committee (CMCC) meetings are held with representatives of communities located within the mine concession area. The meetings are attended by the community leaders and government officials. These, as well as other community meetings (Farmers Association Meetings,

Community Project Team, and Blast Monitors and Crack Assessment Team) provide a forum for GSWL to present information to the community including progress on any requests or complaints, and for the community to discuss issues. As discussed in Section 7.2, GSWL also provides training programs to in cyanide awareness and emergency response community heads and officials, schools, police and other community members who disseminate the information to the community. These forums also provide an opportunity for stakeholders to communicate concerns.

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:

GSWL dialogues with the community on cyanide management practices and procedures through provision of training programs. Training is provided in English and/or Twi (the local language also used by the community) depending on the audience, to community representatives, leaders and officials, schools and outside responders. Since May 2008, six cyanide related training/dialogue sessions have been held, attended by between about 30 and 60 community members, depending on the session.

As the community associates cyanide to a mining company rather than the transporter, GSWL has taken on the responsibility of providing emergency response dialogue to communities along the cyanide transportation route. Communities have been provided with a phone number to call in the event of an emergency or concern.

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:

GSWL has a policy of accurate, transparent and timely two way consultation with the community. Activities related to environment and other issues are discussed at scheduled

CMCC meetings which are attended by the various interested parties and stakeholders. On site forums are also provided where community representatives may observe and discuss environmental management practices undertaken by GSWL.

Community training in cyanide awareness and response is provided with the aid of video and PowerPoint® presentations. Printed copies of the PowerPoint® presentations as well a copy of an Emergency Response brochure (provides community response procedure and emergency contact information) are handed out to attendees of the sessions. Attendees are instructed to use these materials to help disseminate cyanide awareness and response to others in the community.

Although there are no formal incident reporting requirements in Ghana, Golden Star has committed to report Level 3, 4, and 5 incidents (those incidents that result in on-going but limited environmental damage and or result in more serious impacts). GSWL has an Incident Reporting and Investigation procedure that sets out reporting procedures including those to government authorities and local agencies. GSWL indicate that government agencies would release incident information to the public through their web sites and to the media.

Outside of the established lines of communication with local communities and notifying government authorities Golden Star has also committed to publicly report on its environmental and safety performance. Information on cyanide related releases or exposures would be made publically available through the Annual Sustainability Report that Golden Star prepares and posts on its web site, www.gsr.com. The Sustainability Report provides information on social, environmental, health and safety performance, on an annual basis, and includes detail on environmental and safety incidents and responses. Golden Star is a signatory to UN Global Compact and reports environmental performance through this initiative.

Wassa Mine		September 17, 2009
Name of Mine	Signature of Lead Auditor	Date