SUMMARY AUDIT REPORT

for the April 2016
International Cyanide Management Code Recertification Audit

Prepared for:
Golden Star Resources
Golden Star (Wassa) Limited

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

FINAL
September 21, 2016

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SUMMARY AUDIT REPORT

Name of Mine: Wassa Mine

Name of Mine Owner: Golden Star (Wassa) Ltd

Name of Mine Operator: Golden Star (Wassa) Ltd

Name of Responsible Manager: John Seaward, General Manager

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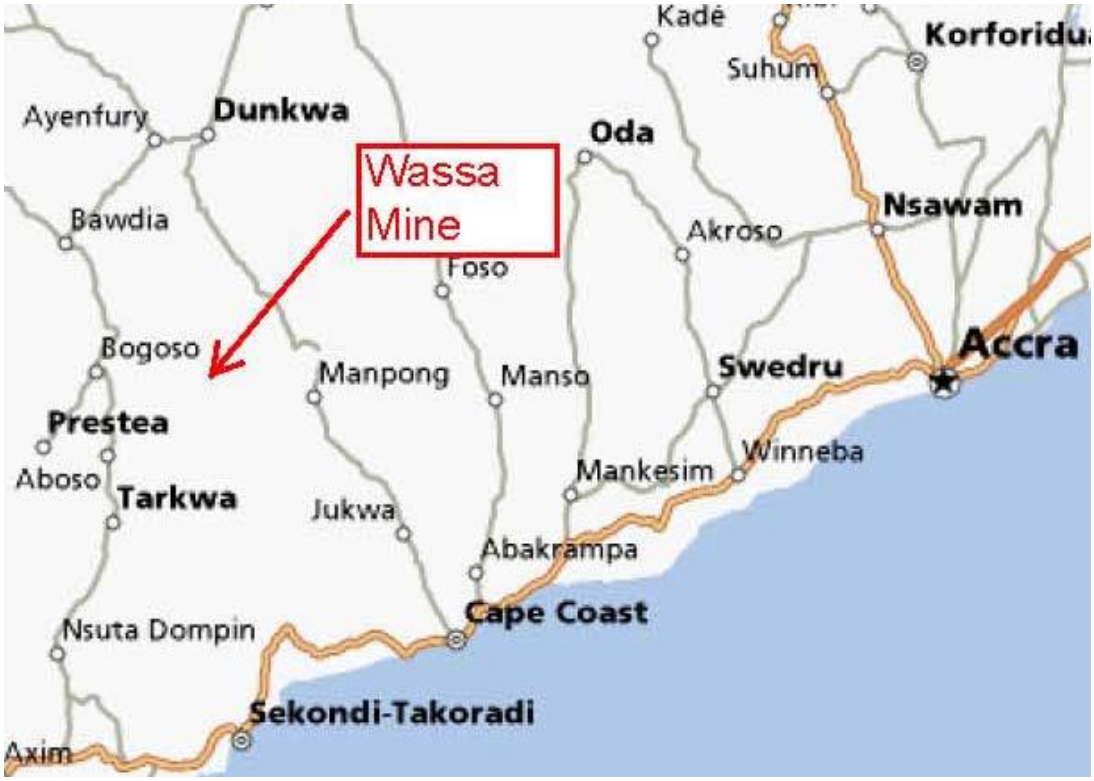
Location detail and description of operation:

The Golden Star (Wassa) Limited 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 mine was originally a heap leach operation, but was converted to a conventional carbon-in each (CIL) operation when GSR purchased the property in 2001. With exception of a modest expansion of the existing tailings management facility (called the TSF-1 extension), the mine's cyanide infrastructure has not been modified substantially in the years since the 2013 certification audit. A second TSF was observed to be in the early stages of construction. Current cyanide management infrastructure includes:

- a cyanide storage warehouse ("bag-in box" delivery form);
- cyanide mixing/storage facility;
- Carbon-in Leach (CIL) feed hopper;
- Pipe Rector Feed (PRF) pipeline:
- CIL plant;
- carbon wash circuit;
- elution circuit;
- TSF-1, including the noted extension;
- tailings delivery, distribution, and reclaim water pipelines;
- process water ponds;
- cyanide detoxification system; and

- associated concrete and high-density polyethylene (HDPE) lined secondary containment structures, process solution pipelines, valves, and pumps.

The approximate location of the Wassa Mine is shown as follows:



SUMMARY AUDIT REPORT

Auditors' Finding

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

with the *International Cyanide Management Code.*

Apart from the transporter certification issues discussed under standard of Practice 2.2, Golden Star (Wassa) Limited (GSWL) has experienced no significant ICMC compliance issues since the previous recertification audit.

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Audit Team Leader:

Clinton Phaal
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Date(s) of Audit: April 25-30, 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 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*; *Guidance for Recertification Audits for the International Cyanide Management Code*; and using standard and accepted practices for health, safety and environmental audits.

Wassa		September 21, 2016
Name of Mine	Signature of Lead Auditor	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:

In the years since the 2012 certification audit, Golden Star (Wassa) Limited (GSWL) purchased cyanide from Orica through 2015, at which point the source of supply changed briefly to Tongsuh Petrochemical Corp., Ltd. (Tongsuh) and then to Hebei Chengxin Co., Ltd (Hebei). The Orica Cyanide Supply Agreement noted in the 2012 audit remained in effect, however, and as noted in the 2013 Detailed Audit Findings Report (DAFR) contains contractual language such that it is implicit that Orica's Yarwun, Australia facility remain certified to the ICMC. In 2015 cyanide from Tongsuh was briefly purchased through a simple purchasing agreement with a certified distributor/transporter (Samsung) and then replaced with Hebei; cyanide from Hebei was also purchased through a simple purchasing agreement, and it is understood that Hebei will be the primary supplier in future. All of the cyanide stocks stored at the site or received during the audit were all from Hebei. Neither of the purchasing agreements specifically require cyanide to be produced at a certified facility; however, it was separately determined that all cyanide used since 2013 has been produced by an ICMC-certified chemical manufacturer. All cyanide used at the Wassa site since the 2013 audit has been produced by chemical manufacturers currently certified to the ICMC; these are:

- Orica (Yarwun plant), Australia (certification current through October 29, 2016);
- Tongsuh Petrochemical Corp., Ltd (certification current through March 11, 2017); and
- Hebei Chengxin Co., Ltd (certification current through December 16, 2018).

Pursuant to guidance provided in *International Cyanide Management Code Verification Protocol for Gold Mine Operations,* a finding of full compliance with Standard of Practice 1 may be made regardless of the precise wording of the purchasing documents.

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Name of Mine	Signature of Lead Auditor	Date

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: I in full compliance
in substantial compliance
■ not in compliance…with Standard of Practice 2.1.

Discuss the basis for the Finding/Deficiencies Identified:

As noted in Standard of Practice 1, Orica continued to deliver cyanide under the same supply agreement in place in the 2013 certification audit until April 2015, at which time due to contractual issues an alternate supplier was sought. The same transportation arrangements noted in the 2013 recertification audit initially remained in place for all Orica cyanide, with final delivery from the Port of Takoradi made by Barbex Technical Services, Ltd. (Barbex). However, it is noted that Barbex withdrew from the ICMC as of June 13, 2014; delivery responsibilities were reportedly transferred to Vehrad Transport and Haulage Limited (Vehrad) until shipments from Orica were replaced with cyanide from alternate sources in 2015. Use of Vehrad was confirmed by reviews of chain of custody details on a sample of shipping documents; Vehrad was last recertified to the ICMC on January 26, 2015.

After cessation of Orica shipments cyanide was purchased on an interim basis under simple purchasing agreements with Hebei (deliveries began in April 2015), and Tongsuh (deliveries began in September, 2015). The agreement with Tongsuh was via Samsung's current Africa Supply Chain, which includes the Port of Pusan, South Korea, ocean transport by MSC or Maersk, and the Port of Takoradi. Review of a sample of receiving records indicates that Vehrad delivered the cyanide from the Port of Takoradi to the mine. The Samsung Africa Supply Chain was last certified November 4, 2014. Vehrad was last recertified to the ICMC on January 26, 2015.

After April 2015, GSWL purchased its initial and its most recent stocks of cyanide from Hebei via simple purchasing agreements with Hebei and Allship. Neither agreement is explicit with respect to the designation of responsibilities as noted in 2.1(1) (a) through (l), although it is clear that GSWL is responsible for unloading cyanide upon receipt at the mine. It was also noted from review of chain of custody information that Hebei shipped cyanide to the ports of Tianjinxingang using its certified transportation company (Hebei Chengxin Transport Co., Ltd.), that the ocean carrier was MSC, that it was received at the Port of Takoradi, and that it was shipped to the mine using Allship's ICMC-certified Ghanaian trucking service (Allship Logistics Service). Hebei Chengxin Transport Co., Ltd. and Allship Logistics Service were last certified to the ICMC on October 31, 2013 and July 23, 2013, respectively. Review of the

ICMC website did not reveal any current ICMC supply chain certification by either Hebei or Allship that specifically included the Port of Tianjinxingang, the ocean carrier, or the Port of Takoradi. This certification gap is considered a non-conformance under this ICMC Standard of Practice, and the situation was brought immediately to the attention of GSWL, who in turn informed Hebei and Allship. Allship in turn immediately notified ICMI of their intention to certify Allship's China Supply Chain, addressing receipt and management of cyanide at the ports of Tianjinxingang and Qingdao in China; ocean transport by MSC and Maersk; and receipt and management at the Ports of Takoradi and Tema in Ghana. The ICMI website notes a May 11, 2016 signatory date for this supply chain. Allship also provided copies of correspondence to the audit team indicating that planning was underway for completion of a due-diligence report and ICMI review of its China Supply Chain certification using an ICMI-approved lead transportation auditor, and prior to the submittal of this report provided status reports indicate that the audit was complete and had been submitted to ICMI for completeness review.

By way of corrective action, GSWL also prepared a new internal standard operating procedure (SOP) to guide purchasing staff in conducting detailed ICMC certification checks of the complete supply chain in the event that new sources or new transportation services need to be found in future. Copies of the new SOP and training records were provided for audit team review and found to be satisfactory. A Corrective Action Request (**CAR-GSWL-001**; see attached) has also been prepared by the audit team that requests GSWL to provide objective evidence that indicates successful completion of the Allship China Supply Chain audit and full acceptance of the associated audit report by ICMI. Upon receipt of such notification, in the audit team's judgment the CAR will be satisfied. Given that the corresponding section of the *Auditor Guidance for Use of the Gold Mining Operations Verification Protocol* (ICMI, July 2012) permits acceptance on the basis of full certification of all elements of the transportation supply chain as an alternative to executing a detailed written agreement specifically addressing the items noted in 2.1(1) (a) through (l), this standard of practice may be considered to be in full compliance when **CAR-GSWL-001** is closed. In the audit team's judgment, CAR closure, in combination with the corrective actions already taken by GSWL, will also permit upgrading the noted noncompliance determination to a recommendation for ICMC certification on the basis of a determination of full compliance

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:

Please see the discussion under 2.1 above; the Orica contract specifically notes ICMC certification requirements for all links in the supply chain, but the Samsung and Allship's Purchase Agreements do not include similarly explicit requirements. However, the

corresponding section of the *Auditor Guidance for Use of the Gold Mining Operations Verification Protocol* (ICMI, July 2012) permits acceptance as long as cyanide is transported by a certified transporter/transportation chain. For this reason, when **CAR-GSWL-001** is closed, this standard of practice may be considered to be in full compliance. In the audit team's judgment, CAR closure in combination with the corrective actions already taken by GSWL will also permit upgrading the noted noncompliance determination to a recommendation for ICMC certification on the basis of a determination of full compliance.

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:

There have been no substantive changes to the cyanide unloading, mixing, and storage areas since the 2012 recertification audit. Cyanide is delivered only in solid briquette, "Bag-in-box" delivery form. The operation has two cyanide mixing/storage facilities, which each consist of a bag-spitting cabinet and mixing tank and storage tank situated within a concrete containment. The active facility is located at the mill, and another inactive facility is located at the CIL plant; the latter has not been used it since the 2012 recertification audit. Metallurgical Design and Management (Pty) Ltd. (MDM) design drawings for these facilities, and documentation of an independent review of same by Top Sky as requested in the original 2009 audit remain on file. Bothe the active and inactive facilities remain within a secured area well within the GSWL process facility. The facilities are over 1,500 meters from the nearest village and are about 100 meters from the nearest surface drainage.

Concrete containments provide secondary containment for the mixing and storage tanks, and the concrete loading pad at the cyanide storage facility is bermed to keep surface run-on out of the unloading and storage area. Mixing and storage tanks are equipped with high level indicators and audible/visual alarms. GSWL continues to inspect the tank level probes, sensors and alarm systems during weekly electrical preventive maintenance (PM) checks. The mixing and storage tanks are located within a well-maintained dedicated concrete impoundment. Cracks in the concrete appear to have been regularly patched and sealed. The solid cyanide storage facility now in use is a dedicated bay in a new warehouse structure near the mill, which is significantly closer to the mixing area than the warehouse area adjacent to the CIL that was noted in previous audits. The bay is open to the atmosphere, is covered for rain protection, and

provided with a concreate floor, perimeter drains, appropriate signage, and Material Safety Data Sheets (MSDS). A separate bay in the warehouse is also provided for accumulation of cyanide packaging materials pending shipment for disposal. The cyanide mixing/liquid storage facility is also open to the atmosphere and has substantial natural ventilation.

Cyanide is stored in bag-in-box form (nylon supersack and polyethylene moisture barrier, overpacked with plywood pallet crate) on a concrete pad in the storage facility, which is covered by a metal roof in a structure with open sides. The pad has an integrated channel which collects any precipitation runoff from the roof gutters and a concrete unloading apron. Mixed liquid cyanide is stored outdoors in carbon steel tanks next to the mixing tank, which are provided with concrete secondary containment.

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:

There have been no substantive changes in the practices observed in the 2012 recertification audit; packaging residues are collected an a secure area in the storage warehouse pending pickup by the transporter and shipped to a dedicated disposal facility that services multiple mines. Review of purchasing agreement records and a sample of shipping papers indicate that Barbex, Vehrad, and Allship all have provided packaging residue removal services as part of their arrangements with GSWL. There have been no substantive changes in the unloading and mixing SOPs observed to be in use in the 2012 recertification audit. The audit team witnessed a cyanide receipt and offloading event as well as a mix event. No issues were noted in the offloading activity; however as noted in section 3.2(1) (b), observation of the mixing process suggested manual washing of the bag presented a certain risk to the operator due to excessive handling of the cut bag, splashing of rinseate, and especially the significant additional time required in very hot environmental conditions wearing impervious chemical PPE. Prior to the submittal of this report, a simple water spray head arrangement was installed inside the cutter assembly to permit remote rinsing of the bag inside the booth, prior to removal. The SOP was modified to require raising and lowering the cut bag over the spray assembly three times prior to removal; photographs of the spray head, the updated SOP, and training records for affected operators were provided for the auditors' review.

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:

Discussions with GWSL management staff and direct observation indicates that there have been no substantive changes to operating plans and procedures since the 2012 recertification audit. GSWL continues to operate the cyanide mixing/storage facility located at the mill. The mixing/storage facility at the CIL plant only maintained as a backup. The mixing/storage facility located at the CIL plant remains inactive. The primary procedures related to operation of cyanide facilities noted in the 2012 recertification audit remain in effect. GSWL also continues to maintain plans and procedures which form the basis of the facility design and operation. As of the date of the audit, the only substantial modification or addition to the cyanide management facilities noted above was a 16.2 ha extension of TSF-1; however, the extension is managed as an integral part of TSF-1. No significant modifications were required either to Procedure PM No. 025 – Water Balance (working model) water balance or the Procedure PM No. 013 – Tailings Storage Facility Operations Manual.

Knight Piésold designed TSF-1 as well as the extension and developed the operations manual for the TSF. The Knight Piésold documents noted in 2012 plus the design report for the TSF-1 extension provide the design parameters and operation of the facility; key considerations in the design of the extension include:

- Provision of 2.21Mt Tailings storage capacity, with an additional 2.05Mt capacity to be created by paddocking;
- A single construction phase, to included excavation of a portion of a coffer dam to merge the TSF 1 extension into TSF-1 when TSF-1 tails have risen to a predetermined elevation;
- Sub-aerial deposition of tailings slurry to optimize the density of deposited tailings;
- Installation of appropriate instrumentation for assessment of potential downstream environmental impacts; and
- Installation of effective drainage control systems, including groundwater drainage and under-drainage systems, collection sumps, the decant system, and an emergency spillway.

Procedure PM No. 013 – Tailings Storage Facility Operations Manual applies to both TSF-1 and the TSF-1 extension, and provides a description of the operating requirements, operating procedures, a list of responsible personnel, and operation and contingency plans for a set of potential emergency scenarios The primary parameters for management the facility have

not changed. Procedure PM No. 013 – Tailings Storage Facility Operations Manual also contains inspection, monitoring, and emergency management procedures, and continues to define the overall water management procedures and inspection program for TSF-1 and the TSF-1 extension. The procedures call for removing water as rapidly as possible and keeping the supernatant pond as small as possible to meet operational needs. Reclaim water is pumped back to the process water ponds at the CIL plant for process makeup use, and requirements for daily, weekly and quarterly inspections are outlined.

Procedures are provided for ensuring the safe containment of solutions in the process water ponds and for maintenance of the water balance model. GSWL continues to use the same PRONTO software-based Preventive Maintenance (PM) system to schedule and track completion of maintenance activities. The PM program continues to address routine inspections of cyanide circuits at the mill and CIL plant; the elution circuit; the cyanide detoxification circuit; the TAC 1000 automatic cyanide dosing system; sump, process water, TSF decant pumps, and routine electrical inspections. The Mine Maintenance department continues to perform routine PM on the emergency power generators. Operations personnel continue to perform routine, checklist-supported inspections of cyanide facilities as noted in the 2012 recertification audit. These include 1) daily inspections of: the mixing/storage facilities at the mill and CIL plant; secondary containment facilities; PRF pipeline; tailings and reclaim pipelines; process water ponds; and 2) weekly inspections of the Anti-pollution Pond at the mill, process areas and solid cyanide storage facility. The cyanide detoxification pond system at the CIL was noted to be out service; it is understood that the inspection program will be reinstated if processing data indicates trends.

Maintenance work continues to be tracked and archived on the PRONTO system. GSWL has also continued to contract annual ultrasonic (UT) thickness testing on the process tanks and PRF pipelines. GSWL replaced Procedure PM No. 039 – Change Management Request with Change Management Request Form CM 001, which is used for identifying and documenting evaluation of potential environmental and health and safety risks associated with changes in cyanide management-related processes or operating practices. Complete Change Management Request forms must be reviewed and signed off by Safety, Environmental, Engineering, Maintenance, Electrical, and the head of the originating department.

Process and practice changes which have occurred subsequent to the 2012 recertification audit include the TSF-1 extension, the initiation of the construction of a new, separately located tailings facility (to be designated TSF-2), installation of a new pre-leach thicker, installation of a new oxygen plant, and the installation of a simple bag-wash system in the bag cutter booth at the cyanide mixing and storage facility.

Procedure PM 038 - Contingency Plan in an Event of an Upset in the Operation's Water Balance provides guidance on restoring appropriate water levels in the process ponds in both negative and positive water balance upset conditions. The ponds receive decant water pumped back from TSF-1/-1E. If the upset is positive, water levels are high, and water must be discharged from the process ponds because of insufficient demand in the process plant, and if measured cyanide levels are above discharge limits, contingency procedures require pumping of excess water to the cyanide detoxification facility for treatment prior to discharge. It is noteworthy that water levels have trended low over the last nine years, to the point at which use of the detoxification facility has not been a consideration, and the facility has

remained out of service since 2009. Should the process water pond levels begin to trend positive, it is understood that the detoxification facility will be refurbished and brought back to operation under a routine PM inspection program against the possibility that it might be needed in an emergency. Procedure PM No. 013 – Tailings Storage Facility Operations Manual also includes contingency procedures for actions to take in the event the water level in TSF-1/-1E embankment piezometers has risen more than one meter since the last monthly measurement. PM No. 013 also contains a Risk Register describing potential hazards and potential mitigation measures. Emergency response flowcharts are also provided that address the appropriate sequence of actions to take in the event of a failure or if warning signs of potential failures are detected. Failure conditions for which flowcharts are provided include pipeline failures, sump overflows, and abnormal seepage from embankments.

The Cyanide Emergency Response Plan also outlines emergency response activities address potential accidental releases involving cyanide during transport or from storage and/or process facilities. The Cyanide Facility Decommissioning Plan also provides, by reference, a general description of contingency actions to take/procedures to follow in the event of temporary closure or cessation of operations such as completion of monitoring, inspections and related reporting actions for all cyanide facilities.

Review of inspection records and discussions with the ICMC Coordinator and tailings supervisor indicate that GSWL continues to inspect TSF-1 (and now the TSF-1 extension) on a daily basis, as noted in the 2012 recertification audit. Operators, shift supervisors, and the tailings supervisor perform individual daily inspections. The daily TSF inspections include observations for wildlife mortalities. Environmental personnel continue to monitor the piezometers at the TSF-1/-1E embankments and forward the results to Knight Piésold for review. Knight Piésold also is separately contracted to conduct independent quarterly inspections. The maintenance department also performs routine PM inspections of process areas. Additionally, operations personnel conduct daily and weekly inspections of process areas, including water levels at the process water ponds. In the auditors' judgement, the noted inspection frequencies are appropriate and sufficient for ensuring that cyanide process areas and the TSF are functioning within their established design parameters.

The inspection practices observed in the 2012 recertification audit remain essentially unchanged. Operations staff visually inspect the mixing and storage tanks at the mill and CIL plant tanks on a daily basis to check for leaks and signs of corrosion. These inspections continue to be recorded on Checklist PM No. 002 – Daily Inspection Check List for Cyanide Valves, Pumps and Pipes. GSWL also uses specialty contractors to perform annual UT thickness tests on the CIL tanks, cyanide mixing and storage tanks, the strip solution tank, elution column, acid wash cone, the CIL feed hopper, the tailings hopper, and the PRF pipeline. Inspection records are retained in the metallurgical department.

The secondary containment arrangements observed in the 2012 recertification audit are generally unchanged, and consist of concrete impoundments at the cyanide mixing/storage facilities, CIL feed hopper, CIL tank farm, and carbon wash and elution circuits. Most of the PRF pipeline between the mill and CIL plant and the tailings delivery pipeline between the CIL plant area and the TSF are contained within HDPE-lined trenches. The trench for the PRF pipeline drains to a lined catchment basin, and the TSF delivery pipeline trench

drains to the process water ponds. In the event of extreme precipitation, or a potential solution leak in the first section of PRF pipeline (i.e., a steel trestle supported run of PRF pipeline from the CIL hopper to the upper end of the PRF pipeline and containment trench) or any overflows from the concrete impoundment areas at the CIL feed hopper or mixing and storage area, the HDPE-lined Anti-pollution Pond at the mill provides substantial containment for any spillage or overflow. As noted in the 2012 recertification audit, approximately 10 meters of the trestle-supported run of PRP pipeline is provided with a secondary HDPE cover or barrier wrapping to prevent any potential impact from a solution leak to a small watershed area downgradient from the PRF pipeline and trench.

Inspection checklists used to document containment inspections have not changed since the 2012 audit. As noted in the 2012 recertification report, in 2011 GSWL also contracted an independent inspection of all the ponds and the concrete containment at the CIL plant, including the cyanide detoxification ponds, process water ponds, Anti-pollution Pond, and other event ponds, tailings pipelines, tailings reclaim pipelines, and CIL containments. Completed inspection checklists and independent inspection report are on file.

The PRF pipeline and other pipelines located within the HDPE lined secondary containment trench are covered by loose sheets of liner fabric, which are meant to prevent solution from spraying outside the trench in the event of a pipe rupture and to minimize the amount of leaf litter and other forest debris that that appears to accumulate in the trench. Although procedural improvements were made as a result of the 2012 audit, maintenance of the PRF pipeline is a chronic issue due to the large amount of leaf litter generated in the adjacent forest area. It is also noted that just prior to the audit, a leak had develop in the upper end of the trench-protected run of PRF pipeline, and the pipeline section had been replaced. The liner had been damaged in the process of replacing the PRF, and had not yet been repaired and the time of the audit. However, prior to the submittal of this report, GWSL completed repairs to the trench and conducted full cleaning of the entire run of the pipeline between the end of the PRF trestle to the CIL feed hopper, and the roadway flyover adjacent to the CIL impoundment; substantial photographic evidence was provided to the audit team documenting the completion of the HDPE repair and trench cleanout activity. In addition, lined drainage improvements were made to connect the lower end of the PRF trench with a lined trench reporting to the process water pond system, and the pipe-pipe arrangement for the roadway flyover trestle was extended towards the CIL another 2 meters, in order better ensure that any leakage would report to the main CIL impoundment. A hole originally installed in the CIL impoundment after the previous recertification audit for purposes of receiving any spillage from the lower end of the PRF pipeline trench was repaired to restore full capacity to the CIL impoundment; this was also made in consideration of the aforementioned improvements connecting the lower end of the PRF trench with a lined trench reporting to the process water pond system. These improvements were photographed and presented for audit team review prior to submittal of this report.

The concrete impoundments at the active mixing/storage facility and at the CIL feed hopper were observed to be in very good condition. However, major areas of spillage were observed within the CIL impoundment, which was undergoing major maintenance at the time of the field component of the audit. GSWL subsequently provided photographs of the

condition of the containment after the spillage have been cleaned up; based on the evidence provided, the CIL containment arrangements appear to be in good condition.

GSWL no longer has any active heap leach facilities. The operation uses series of four interconnected, HDPE-lined ponds (collectively, the process water ponds) to store TSF-1/-1E reclaim water. These ponds originally functioned as solution ponds for the now-defunct heap leach facility. The process water ponds are double-lined, and two of the ponds (Pond 1 and Pond 3) have leak detection systems. GSWL continues to monitor these daily and records of observations of any observed leakage are reported on Checklist PM No. 019 – Daily Inspection Checklist for the Integrity of Process Water Ponds, Pipes, Leak Detectors, Pumps and Valves.

As noted in the 2012 recertification audit, GSWL installed piezometers within the concrete ring-beam foundations of the six CIL tanks and monitor them on a weekly basis. The auditors observed several of the leak detection monitors were covered in slurry or had temporary replacements caps; however, prior to the submittal of this report, GSWL provided photographic evidence demonstrating installation of proper fitted replacements for all missing caps or temporarily covered piezometer standpipes.

GSWL continues to implement its PRONTO-based PM program, which includes routine mechanical and electrical inspections of cyanide facilities, including pumps and valves. As note in the 2012 recertification audit GSWL staff may prepare work orders when issues requiring repair are identified. Examples of work orders (with subsequent repairs) issued in 2014, 2015, and 2016 by operations personnel for cyanide facility equipment were reviewed directly on the PRONTO system.

Operations staff also continue to routinely inspect cyanide facilities, including daily inspections of the valves, pumps and pipelines at the cyanide mixing/storage facilities and weekly inspections of the process areas. Operations personnel also visually inspect the tailings delivery, distribution and reclaim pipelines during the daily TSF-1 inspections. Shift supervisors conduct visual inspections of the PRF pipeline.

GSWL continues to implement the inspection program outlined in Procedure PM No. 013 – Tailings Storage Facility Operations Manual. PM No. 13 requires daily and weekly inspections of TSF-1/-1E that address tailings beach levels; supernatant pond location, elevation and depth; operation of decant pumps; pipelines; embankment integrity; seepage sump conditions; and water balance. Quarterly inspections by Knight Piésold are also required. Inspections of the process water pond are documented in accordance with Checklist PM No. 019 – Daily Inspection Checklist for the Integrity of Process Water Ponds, Pipes, Pumps and Valves). Hard copy records of the TSF and process area inspections have been retained (as verified by review of a random sample of inspection records from 2014, 2015, and 2016). PM checklists and work orders issued by operations personnel are archived on the PRONTO system; the ability of the system to access records from 2014, 2015, and 2016 was also verified.

GSWL still maintains 13 diesel-powered generators (4 are typically on standby) to provide emergency power during outage, and regular PM is performed. Outages are reportedly

rare. GSWL Mine Maintenance continues to schedule mechanical PM services on the generators after 1,000 and 2,000 hours of operation, along with weekly prestart checks initiated via the PRONTO system. Maintenance performs hourly checks of the generators while they are operational; general electrical maintenance is also provided by GSWL electricians.

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:

TAC 2000 model previous used has now been replaced by a TAC 1000 cyanide and pH analyzer/controller [NB: discussions with GSWL staff and review of the manufacturer's website (http://www.process-analytical.co.za/prod04.html) indicates that the TAC 2000 system is no longer in production]. The TAC 1000 device is designed to regulate, and where possible 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 relative to a metallurgically appropriate set point. Manual titrations are still conducted as backup to the automated titrations performed by the controller, and GSWL also conducts bottle roll tests weekly in order to further optimize cyanide consumption, as required by Procedure PM No. 010 – Test Work for Cyanide Optimization.

It is understood that GSWL continues to implement procedure PM No. 026 –Operating Plan for CIL and Other Facilities, which Manage Cyanide Process Solutions, and PM No. 033 – Cyanide Addition Rates in CIL Feed Hopper and CIL Tanks, also in an effort to optimize cyanide use relative to its production goals and the geochemical characteristics of the ore being processed

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:

The GSWL water balance is documented in a regularly updated an Excel-based model and is identical to the model observed in the initial certification audit and the 2012 recertification audit. The water balance is documented in annual Excel workbooks, which were examined for 2013, 2014, 2015, and 2016. The addition of the extension to TSF-1 did not require any significant modification of the model; although a new model will need to be

developed for TSF-2 when it is brought into operation. The primary water management components of the GSWL operation continue to include TSF-1/-1, the process water ponds, and the process plant; the cyanide detoxification system has not been use since 2009, as water levels never accumulated to the point that release to the environment was required.

As noted in the 2012 recertification audit GSWL updates the water balance monthly with actual data and primarily uses the model as a water consumption accounting tool, although it has features that would allow it to be used as a probabilistic, predictive modeling tool. Monthly evaluations of the water balance model are currently distributed to the Plant Operations Manager, Plant Superintendent, the Environmental Manager, and Knight Piésold..

There have been no changes to the TSF that affect the design freeboard noted in the 2012 recertification audit. The minimum freeboard at TSF-1/-1E is 1.3 meters based on a 100-year, 24-hour storm event plus one meter, and the TSF is operated to maintain this requirement per Procedure PM No. 013 – Tailings Storage Facility Operations Manual. The water balance model Procedure PM No. 025 – Water Balance (working model)] is used to calculate the net volume of water gained (or lost) on a monthly basis and GSWL inspects the TSF beaches daily to ensure adequate freeboard is maintained. Monthly water balance updates are distributed to the Plant Operations Manager, Plant Superintendent, the Environmental Manager, and the TSF Engineer Knight Piésold).

Physical examination of TSF-1/-1E indicated that gauge posts are still installed around the facility, and a sample of inspection records from 2013, 2014, 2015 and 2016 confirms that beach levels are routinely recorded during daily inspections. Knight Piésold assesses beach elevations in their monthly reviews of the update water balance model. They also conduct, their quarterly inspections, which are designed to ensure that the facility is operated safely, efficiently, and in accordance with the design intent and generally accepted good management practices for such facilities.

No changes have occurred in the years since the 2012 recertification audit with respect to practices for the measurement and analysis of precipitation data, GSWL continues to collect meteorological data at an onsite station located at the mill, as well as a rain gauge located at TSF-1. These data are still collected on a daily basis and are used to support monthly updates of the water balance model.

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:

Review of summary water quality data in TSF-1/-1E and the process water ponds for 2013, 2014, 2-015, and 2016 indicate that as noted in the 2012 recertification audit, there is no open water at the site that has WAD cyanide in concentrations ≥50mg/l. GSWL continues to conduct daily inspections of TSF-1, the TSF-1 extension, and the process water ponds, which

include monitoring for wildlife mortalities. Review of a sample of daily inspection records and discussions with the ICMC Coordinator and other GSWL staff indicate that no wildlife mortalities have occurred in the years since the 2012 recertification audit.

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:

As noted in the 2012 recertification audit, during the wet season, the water balance at the Wassa operation is in a positive state, and the operation was designed with a detoxification facility if it became necessary to provided 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 operation also may discharge directly from the Mill Anti-pollution Pond if EPA and ICMC water quality criteria are met. However, review of the 2012 recertification audit report and discussions with the ICMC Coordinator and other GSWL management staff indicate that the last direct discharge to surface water was from the Mill Anti-pollution Pond in 2009. The combination of low water levels and the significant water retention capacity provided by the Process Water Pond system has been such that no detoxification processes have been required. As previously noted, the detoxification circuit was observed to be non-operational and has been removed from the regular PM program. It is anticipated that process changes will be required as TSF-2 becomes operational, and the detoxification circuit may need to be refurbished and brought back into the PM project to support periodic operational needs.

GSWL does not have an established surface water mixing zone, and there has been no environmental discharge since 2009. However, in keeping with applicable regulatory requirements, GSWL currently monitors for free cyanide on a monthly basis at multiple surface and groundwater sampling locations downstream of TSF-1/-1E and the mill/CIL/ process water pond areas. These sampling locations have increased over the four noted in the 2012 recertification audit, and are identified as SW-M-02, SW-M-11, SW-K-01, SW-K-03, SW-K-04, SW-K-05, SW-K-10, SW-Ku-01, SW-Ku-04, SW-Ku-06, SW-M-04, SW-M-07, W-DO-29, MB-01A, MB-01B, MB-02A, MB-02B, MB-03A, MB-03B, MB-04A, and MB-04B. GSWL provided water quality data for these monitoring points for 2014, 2015, and though April 2016. The data were evaluated and indicate that Free cyanide levels have remained consistently below 0.022 mg/L at all locations sampled.

As noted in the 2012 audit report, GSWL conducts Free cyanide analyses using a HACH DR/890 Colorimeter and has implemented a procedure (Procedure EN 11) for Free cyanide analysis in surface and ground water. TSF-1/1E does not have a synthetic liner; the facility was designed to take full advantage of native soils with naturally low hydraulic conductivity, and the embankments are designed with upstream and downstream toe drains to collect seepage and convey it to a series of four concrete sumps (designated TA-SP-01, TA-SP-02, TA-SP-04, and

TA-SP-05). Each sump is equipped with a submersible pump, which returns seepage water to the TSF-1/1E decant pond or the process water ponds. Because none of the collected seepage water is released to the environment, the only potential indirect discharge to surface water would be from groundwater flows in areas of embankment seepage that might not be intercepted by the seepage collection and return system.

Although collected seepage water is not released to the environment, GSWL monitors the four sumps for cyanide on a monthly basis. Review of seepage water quality data from January 2013 through June 2016 indicates WAD CN values substantially less than <0.5mg/L and Free CN values substantially lower that O.022mg/L for the sumps at saddle dams 2, 4, and 5 (sumps TA-SP-02, TA-SP-04, and TA-SP-05). Seepage water quality values for the sump below the main embankment (TA-SP-01) do indicate sporadic, randomly occurring spikes above the noted reference values in both WAD and Free CN concentrations, for 8 of the 42 monitored months in the data set. However, as noted in 4.6 below, review of monitoring data submittals to Ghana EPA indicates Free cyanide values measured at all required surface and ground water compliance and control monitoring points remained consistently below 0.022 mg/L at all locations sampled. Where WAD analyses were required, concentrations were non-detect or well below 0.5 mg/l over the same time period. Therefore, in the auditor's judgment, the seepage collection and return system at TSF-1/-1E therefore appears to be functioning as intended and there are no substantive indirect discharges to surface water.

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:

As noted in 4.5 above, TSF-1/1E does not have a synthetic liner; embankments are designed with upstream and downstream toe drains to collect seepage and convey to a series of concrete sumps equipped with submersible pumps, which return water to TSF-1/1E or process water ponds. GSWL conducts daily inspections of these sumps and collects monthly water samples for cyanide analysis.

Procedure PM No. 013 – Tailings Storage Facility Operations Manual remains in effect, and requires management tailings deposition in a manner that keeps the supernatant pond a minimum distance of 100 meters from the embankments. Additionally, the manual requires that the pond be maintained as small as possible in order to minimize seepage from the facility, maximize the available capacity, and maximize the area available for drying and consolidation of the tailings. GSWL continues to perform comprehensive inspections of the TSF including individual daily inspections by operators, shift supervisors, and the tailings supervisor, and quarterly inspections by the design engineer (Knight Piésold). The inspections address tailings beach levels; supernatant pond location, elevation and depth; operation of decant pumps; pipelines; embankment integrity; seepage sumps; and the water balance. Monitoring

well installations have been maintained downstream of the embankments to enable sampling and analysis of any potential indirect seepage to groundwater.

Ghana EPA does not have a regulatory limit for cyanide in groundwater and there is not a designated beneficial use set by Ghana EPA or other regulatory agencies for groundwater downgradient of the site. However, GSWL currently monitors for free cyanide on a monthly basis at multiple surface and groundwater sampling locations downstream of TSF-1/-1E and the mill/CIL/process water pond areas. These sampling locations are established in communication with regulatory authorities, and have increased over the four noted in the 2012 recertification audit.

Review of monitoring data submittals to Ghana EPA indicates that in 2014, compliance and control monitoring points requiring cyanide analysis were established for SW-M-02, SW-M-11, SW-K-01, SW-K-03, SW-K-04, SW-K-05, SW-K-10, SW-Ku-01, SW-Ku-04, SW-Ku-06, SW-M-04, SW-M-07, MB-01A, MB-01B, MB-02A, MB-02B, MB-03A, MB-03B, MB-04A, and MB-04B. The data indicate that Free cyanide levels have remained consistently below 0.022 mg/L at all locations sampled. In addition, locations SW-M-02, SW-M-11 were also analyzed for WAD cyanide in 2014, and concentrations at both points were non-detect or well below 0.5 mg/l over the same time period. Water quality monitoring in 2015 and 2016 (through April) used the same network of sampling points as 2014; Free cyanide levels were consistently below 0.022 mg/L at all locations sampled, and WAD cyanide concentrations at SW-M-02 and SW-M-11 were also less than 0.5 mg/L.

GSWL continues to submit monthly monitoring reports to the EPA and Inspectorate Division of Minerals Commission, and quarterly reports are provided to the Water Resources Commission. These reports include all water quality data monitored on and off site.

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:

As noted in the 2012 recertification audit, GSWL has implemented spill prevention and secondary containment measures for all cyanide mixing, storage and process solution tanks. The operation has two cyanide mixing/storage facilities, each consisting of one mixing tank and one storage tank in a common 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 and has been inactive since prior to the 2009 ICMC verification audit. The cyanide mixing and storage tanks are situated on concrete plinths (ring beams) located within a concrete containment, which provides secondary containment. Within each concrete containment a sump, with an automated pump, returns any collected solution to the process. The sump at the active mixing/storage facility (located at the mill) returns solution to the CIL feed hopper, which is situated within a concrete containment with a sump and automated pump, which returns any collected spillage back to the hopper.

Should the CIL feed hopper containment experience an overflow, it would be captured downgradient by the HDPE-lined Anti-pollution Pond (tertiary containment).

At the process plant, six CIL tanks are also situated on concrete plinths (ring beams) located within a concrete containment. 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. Two sumps are located within the CIL containment area, which have automated pumps to return any collected solution back into the process (i.e., CIL tanks or tailings safety screen). As noted in the 2012 recertification audit, design drawings reviewed during the 2009 ICMC verification audit demonstrate that the ring beam foundations do not provide an impermeable barrier between the tank bottoms and the ground. Consequently, GSWL installed leak collection and recovery systems within the CIL tank ring foundations to allow for identification of any leakage prior to it entering the environment. These systems are monitored weekly. The carbon wash and elution circuits are also contained within a concrete containment. The contained area has dedicated sumps with pumps for returning solutions and slurries back to the process circuit.

With regards to the use of TMF-1/-1E reclaim water as mill feed, GSWL's practice is to route Process Water Pond water to the tailings hopper and dilute the tailings stream prior to deposition in the TMF. Review of tailings pond WAD cyanide values indicates that between January 2013 and June 2016, monthly WAD cyanide values have been well below the 50 mg/L limit for open ponds. Reclaim water from the TMF is used as process water and has been consistently below the 0.5 mg/L limit. Three excursions were noted above 0.5 mg/L that occurred at random unconnected intervals (January 2016, October 2015, May 2015) but (assuming zero for all non-detect readings), the overall average over the noted three year period is 0.25 mg/L. WAD cyanide concentrations in the process water are monitored and dilution actions are taken if elevated values appear subsequent analyses. Given that the reclaim water is provided additional dilution from pit water routed to the Process Water Ponds prior to process use, and procedures are in place to monitor for and adjust for any excursions of WAD cyanide above 0.5 mg/L it is the auditor's judgment tailings reclaim water should not be considered to be process solution.

As noted in the 2012 recertification audit, the concrete containment at the mixing/storage facility located at the mill provides about 200 percent of the largest tank volume within the containment. The concrete containment for the mixing/storage facility located at the CIL plant also provides a secondary containment volume of about 200 percent of the largest tank volume within the containment.

Following the 2009 ICMC verification audit, GSWL modified the configuration of the concrete containment provided for the CIL feed hopper at the mill to segregate the concrete containment area provided for the hopper and isolate hopper spillage (containing cyanide) from the adjoining containment areas provided for the mill. The secondary containment capacity of the reconfigured containment is 66 m^3. The CIL feed hopper has a capacity of 20 m^3. Secondly, the calculated rainfall volume generated by a 100-year storm event, which would fall into the mill containment area, is 23 m^3 (300 mm of rainfall times the containment surface area). Thirdly, the estimated volume of solution that could drain back to the containment from the PRF pipeline is 30 m^3. Therefore, the secondary containment volume (66 m^3) provides 90 percent of the combined volume (73 m^3) of the CIL feed

hopper, design storm event and process slurry draining back to the containment from the PRF pipeline. However, GSWL indicated that the sump pump in the containment can handle the volume of rainfall with ease during simultaneous upset and storm events. Additionally, GSWL has diesel-powered backup generators, which would ensure the pump availability. Finally, any overflow from the containment would report to the Anti-pollution Pond via gravity flow in the concrete channel drainage system.

The six CIL tanks are also situated within a concrete containment, which provides about 140 percent of the largest tank volume within the containment. The acid wash cone and elution column containments are interconnected to the much larger CIL containment.

Procedures for the management of process solution spills within containments have not changed since the 2012 recertification audit. Secondary containments for the cyanide mixing, storage and CIL tanks and the carbon wash and elution circuit vessels all have dedicated sumps and pumps to return spillage to the process. Sumps and dedicated return pumps are also provided for the active mixing and storage tank area, the CIL feed hopper, and the new thickener facility (located at the mill). Spillage management protocols continue to be defined by Procedure PM No. 026 – Operating Plan for CIL and Other Facilities, which Manage Cyanide Process Solutions.

During extreme upset conditions, any overflow from the concrete impoundment at the CIL feed hopper would be conveyed via a concrete channel to the HDPE-lined Anti-pollution Pond near the main gate to the mill. Procedures for the removal of precipitation and spillage collected in the Anti-pollution Pond have not changed. According to these procedures, when silt must be removed to maintain the capacity of the pond, the material is disposed of in the tailings impoundment. When discharge of effluent/water from the pond is required, a permit is filed with the GSWL environmental department. The environmental department then analyzes the water to ensure that Free cyanide concentrations meet effluent discharge standards prior to release. If the water does not meet the discharge standards, it would be routed to the cyanide detoxification plant and treated to below discharge levels prior to release.

As noted in the 2012 recertification audit, the CIL tanks are enclosed within a concrete impoundment that provides an adequate secondary containment volume, but the ring beam foundations constructed for the tanks do not provide an impermeable barrier between the tank bottoms and the ground surface. GSWL installed piezometers within the concrete ring-beam foundations of the six CIL tanks and monitor them on a weekly basis. Such inspections continue to be documented on Checklist PM No. 020 – Weekly Inspections of CIL Piezometers, and no leakage has been noted to date. The auditors observed several of the leak detection monitors were covered in slurry or had temporary replacements caps; however, prior to the submittal of this report, GSWL provided photographic evidence demonstrating that the containment had been cleaned and that properly fitted replacements had been provided for all missing caps or temporarily covered piezometer standpipes. It is understood that if leakage is detected, Procedure PM No. 008 – Wet Sodium Cyanide Decontamination Procedure would apply in the excavation and clean-up of impacted spoil. As leakage would likely be associated with failure of a tank bottom, access to the centre of the ring beams for any required clean-up would be provided during the removal and replacement of the tank bottom. As also noted in the 2012 recertification audit, 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.

At the mill, the PRF pipeline exits the CIL feed hopper containment area on a steel gantry as rubber-lined steel pipe, and is carried overhead across the ore crushing area, facilitating visual inspection. The PRF segment crossing the crushing plant area, from the concrete containment at the CIL feed hopper to a point located approximately 10 meters from a natural drainage, is not provided with double containment. However, as noted in both the 2009 certification audit and the 2012 recertification audit, GSWL conducted a risk assessment considering the entire section of the PRF from the CIL feed hopper containment to the HDPE-lined containment channel. In keeping with the risk assessment conclusions, no additional spill prevention or containment measures were deemed necessary for this segment of the PRF. Subsequent to the 2009 onsite audit, GSWL did install a pipe sleeve (special protection measures) for the portion of the pipeline crossing the natural drainage (see section 4.7.6 below); the sleeve was still installed when viewed in the 2012/2016 audits.

During the audit it was noted that flanged fittings for the PRF were not completely bolted, and a number other flanged fittings, pipelines, and valves also were not installed with complete bolting. However, prior to the submittal of this report, GSWL conducted a PM campaign to ensure that PRF and other process solution tanks pipeline system components were fully bolted. Substantial photographic evidence was provided to the audit team attesting to the completion of this requested action.

The PRF pipeline and other pipelines located within the HDPE lined secondary containment trench are covered by loose sheets of liner fabric, which are meant to prevent solution from spraying outside the trench in the event of a pipe rupture and to minimize the amount of leaf litter and other forest debris that that appears to accumulate in the trench. Although procedural improvements were made as a result of the 2012 audit, maintenance of the PRF pipeline is a chronic issue due to the large amount of leaf litter generated in the adjacent forest area. It is also noted that just prior to the audit, a leak had develop in the upper end of the trench-protected run of PRF pipeline, and the pipeline section had been replaced. The liner had been damaged in the process of replacing the PRF, and had not yet been repaired and the time of the audit. However, prior to the submittal of this report, GWSL completed repairs to the trench and conducted full cleaning of the entire run of the pipeline between the end of the PRF trestle to the CIL feed hopper, and the roadway flyover adjacent to the CIL impoundment; substantial photographic evidence was provided to the audit team documenting the completion of the HDPE repair and trench cleanout activity. In addition, lined drainage improvements were made to connect the lower end of the PRF trench with a lined trench reporting to the process water pond system, and the pipe-pipe arrangement for the roadway flyover trestle was extended towards the CIL another 2 meters, in order better ensure that any leakage would report to the main CIL impoundment. A hole originally installed in the CIL impoundment after the previous recertification audit for purposes of receiving any spillage from the lower end of the PRF pipeline trench was repaired to restore full capacity to the CIL impoundment; this was also made in consideration of the aforementioned improvements connecting the lower end of the PRF trench with a lined trench reporting to the process water pond system. All of these improvements were photographed and presented for review prior to submittal of this report.

The two 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.

In addition to the installation of the aforementioned secondary containment structures, GSWL continues to implement procedures to prevent or minimize releases to the environment from process solution pipeline leaks or ruptures.

In areas where tailings delivery, distribution and reclaim water pipelines that present a risk to surface water, the pipelines are within a lined secondary containment channel or located on the inside slope of the TSF-1/-1E embankments. The HDPE lined secondary containment channel provided for the tailings delivery pipeline, drains to the lined process water ponds. As noted in Section 4.7(5) above, a short section of the PRF pipeline crosses over a natural drainage, which discharges directly to the receiving environment. GSWL has wrapped the section of the PRF crossing the drainage with a welded HDPE sleeve. 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 will report to this catchment basin.

GSWL continues to use steel, rubber-lined steel, HDPE, and PVC primary containment pipelines for conveyance of cyanide solutions and slurries. Cyanide mixing, storage, and process tanks are carbon steel. All of these materials are compatible with cyanide and high pH solutions.

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:

Please see 4.1 above for a list of active cyanide facilities. Please also see the 2009 Detailed Audit Findings Report (DAFR) for the initial ICMC verification audit and the DAFR for the for the quality assurance/quality control (QA/QC) documentation provided for the cyanide facilities in operation at that time. All QA/QC packages referenced in the two previous DAFRs were confirmed to be available on file.

Modifications to existing cyanide facilities installed or constructed subsequent to the 2012 ICMC verification audit include construction of the TSF-1 extension (TSF-1E); an construction of a new warehouse structure near the mill (mill reagent shed) for solid cyanide storage and/packaging residue accumulation service.

Wassa		September 21, 2016
Name of Mine	Signature of Lead Auditor	Date

Knight Piésold served as the Design Engineer for TSF-1E; the Knight Piésold design report [Golden Star (WASSA) Limited, Wassa Gold Mine Design Incorporating The Historic Heap Leach Pad Into Tailings Storage Facility 1 Detailed Design Report. AC301-00010/23 – October, 2014] was submitted to Glocal Engineering for independent QA/QC review, along with index tests and construction QA/QC results and copies of weekly construction progress reports. Glocal's review is documented in Technical Assessment Report: TSF-1 Extension (TSF-1E) Construction Review (Glocal, May 2015). The design of the new mill reagent shed was approved by a licensed architect (Papa Yaw Attobrah, AGIA).

Please see the 2009 Detailed Audit Findings Report (DAFR) for the initial ICMC verification audit and the DAFR for the quality assurance/quality control (QA/QC) documentation provided for the cyanide facilities in operation at that time. All QA/QC packages referenced in the two previous DAFRs were confirmed to be available on file. As noted in the 2012 recertification audit DAFR, GSWL originally relied on quarterly TSF inspections conducted by the TSF design engineer (Knight Piésold) as QA/QC documentation for the TSF, and the consistent performance of such inspections was material to the auditor's determination regarding the finding of compliance for this Standard of Practice. The quarterly inspections are conducted to ensure that the facility is operated safely, efficiently, and in accordance with the design intent and generally accepted good practice. They include a visual examination 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. During this recertification audit, the auditor obtained a copy of the Knight Piésold January 2009 report, which was provided as QA/QC evidence for the TSF during the 2009 ICMC audit. GSWL provided QA/QC construction documentation for new cyanide facilities and modifications to existing cyanide facilities constructed subsequent to the 2012 recertification audit.

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:

There have been no substantial changes to environmental monitoring plans and procedures since the 2009 ICMC verification audit. 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. As noted in the 2009 certification audit and 2012 recertification audit DAFRs, Procedure EN 01 – Surface Water Monitoring and Procedure EN 03 – Groundwater Monitoring were developed by qualified personnel and provide instruction on calibration of field equipment, water level measurement and well purging (for groundwater sampling), sampling and field information, sample identification, quality control, sample

preparation and preservation, sample shipment (including chain of custody procedures), analysis of samples, and data management. The Environmental Monitoring Matrix referenced in both procedures provides the sample locations and frequencies, and field and laboratory parameters to be measured, including cyanide species.

GSWL currently monitors for free cyanide on a monthly basis at multiple surface and groundwater sampling locations downstream of TSF-1/-1E and the mill/CIL/process water pond areas. These sampling locations are established in communication with regulatory authorities, and have increased over the four noted in the 2012 recertification audit. Review of monitoring data submittals to Ghana EPA indicates compliance and control monitoring points requiring cyanide analysis were established for SW-M-02, SW-M-11, SW-K-01, SW-K-03, SW-K-04, SW-K-05, SW-K-10, SW-Ku-01, SW-Ku-04, SW-Ku-06, SW-M-04, SW-M-07, MB-01A, MB-01B, MB-02A, MB-02B, MB-03A, MB-03B, MB-04A, and MB-04B. The data indicate that Free cyanide levels have remained consistently below 0.022 mg/L at all locations sampled. In addition, locations SW-M-02, SW-M-11 were also analyzed for WAD cyanide in 2014, and concentrations at both points were non-detect or well below 0.5 mg/l over the same time period. Water quality monitoring in 2015 and 2016 (through April) used the same network of sampling points as 2014; Free cyanide levels were consistently below 0.022 mg/L at all locations sampled, and WAD cyanide concentrations at SW-M-02 and SW-M-11were also less than 0.5 mg/L.

GSWL continues to submit monthly monitoring reports to the EPA and Inspectorate Division of Minerals Commission, and quarterly reports are provided to the Water Resources Commission. These reports include all water quality data (i.e., surface water and groundwater) monitored on and off site. As noted in the 2012 recertification audit, Procedure EN 01 – Surface Water Monitoring and Procedure EN 03 – Groundwater Monitoring both require recording field data on data sheets representative samples of which were provided for review in this 2016 recertification audit. Field measurements recorded include the date, time, sampling location, stream flow, water color, rainfall for previous 24 hours, pH, temperature, conductivity, TDS, TSS and general comments.

As noted in the 2012 recertification audit, 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. In August 2011, GSWL environmental personnel also began conducting supplemental, monthly wildlife inspections at the TSF. Procedure EN 10 – Monitoring Fauna Mortality provides procedures 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. Review of a representative sample of inspection records for 2013, 2014, 2015, and 2016 and discussions with the ICMC Coordinator and environmental staff indicate that no cyanide-related wildlife mortalities have occurred as of the date of this recertification audit.

In the auditor's judgment, frequencies for the monitoring activities noted above are commensurate with the media being monitoring and should be considered sufficient to identify negative trends in a timely manner.

Wassa		September 21, 2016
Name of Mine	Signature of Lead Auditor	Date

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 consolidated closure plan *Rehabilitation and Closure 2011 Golden Star Resources* (RCP) contains provisions for closure of GSWL's operations in Ghana inclusive of the Wassa, Hwini Butre, Benso and Bogoso/Prestea operations. Operations addressed at Wassa include the processing plant, CIL Tanks, CN related infrastructure including vessels, pipework, process water ponds and TSF management.

The principles for a standardised approach to decommissioning is provided in a corporate standard Rehabilitation and Closure Standard, version 1.2 dated 2014 (RCS), and is intended to apply to all GSR operations. The standard addresses the approach to closure of various aspects such as underground voids and shafts, open pits, tailings disposal facilities, waste rock dumps, plan and other infrastructure, accommodation complexes, water storage dams and service infrastructure. The RCS specifically requires that facilities located in cyanide handling and use areas must be decommissioned in accordance with the cyanide handling and management plan and that any closure costs must specifically reference decommissioning of cyanide facilities.

GSWL has developed a Cyanide Facility Decommissioning Plan (CFDP) specific to the Wassa Mine and dated June 2016. The CFDP provides details of cyanide facility closure planning, and activities for cyanide facilities, tailings disposal facilities, safety precautions and environmental management (including water resources protection, residue management, contaminated site management and local community impacts). A nominal closure schedule is provided in Appendix A of the CFDP.

For the TSF, the most recent closure plan prepared by GSWL is a Draft Closure and Rehabilitation Plan (CRP) prepared by Knight Piésold Consulting and dated March 2014. The CRP addresses the closure of tailings storage facility (TSF 1) and was prepared in accordance with permitting conditions due to a TSF 1 embankment raise to 1,039 mRL. The CRP is at present in draft status and has been submitted to the Ghanaian EPA for discussion. It is the intention of GSWL to finalise the CRP to include the TSF-1E extension.

A decommissioning schedule is provided within Appendix A (Closure Timeline for Golden Star Wassa mine CN Facilities) of the CFDP. The RCP forms the basis for the inputs required to calculate the Asset Retirement Obligations (ARO). The ARO is reviewed and updated annually

and takes into account changes in operations and/or reclamation activities. The most recent ARO review and update was completed in November 2015.

Due to raises in the TSF embankment a review of conditions within the mine's permit required the preparation of a Draft Closure and Rehabilitation Plan has been prepared for TSF1 in 2014.

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:

Cost estimates to fully fund third party cyanide related decommissioning have been prepared on an ARO calculation spreadsheet in electronic format. The cost estimate includes aspects of the operation as specified in the RCP for GSWL. Input parameters are standardised to aspects of the operations sites. The spreadsheet is reviewed annually using current contractor rates and an inflation factor where these may not be available. In 2015, Golder Associates, on behalf of GSWL, independently reviewed and verified contractor rates as appropriate for use in the updated cost spreadsheet. Costs reviewed included for all aspects of decommissioning. The next planned review is for December 2016. Cost calculations makes provision for inflation, 10% contingency and an addition of 6% for preliminary and general contractor costs. The financial mechanism comprises a Reclamation Security Agreement dated 27 April 2012 between the EPA and GSWL and is implemented through a guarantee with CAL Bank and a cash deposit.

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 has standard operating procedures in place that address cyanide receipt, unloading, mixing, plant operations, entry into confined spaces and equipment decontamination. GSWL have also implemented the following two procedures:

- Take 5 mini risk assessments comprising a booklet carried by every worker and which are completed prior to undertaking any task; and

- Job Hazard Analysis (JHA) which is completed for none routine activities and is undertaken where there are a number of hazards to consider.

Procedures are reviewed and updated as required or where there is a change in process or plant. At the time of the site visit, the Safety Department were in the process of reviewing Site Procedures to ensure consistency of instructions and amending content as required to aid personnel understanding of instructions
Procedures are stored on a central server hard drive. The ICMC Coordinator also files information within the Metallurgical Department, however also reports mock drill and Plant induction records to the Safety Department.

SOPs specify the requisite PPE required for each task and also provides a written description of tools and pre-checks required prior to the task being performed.
Pre-checks for cyanide related tasks include cyanide specific training, ensure that a second person is present during certain activities and tasks, inspection of PPE, testing eyewash and shower stations, ensuring that valid permits are in place for equipment operators, confined space entry and work permits, isolating pumps, the correct positioning of flow valves and checking the condition of tools and equipment. For certain types of work including confined space entry, work permits are required which includes that the relevant SOP or JHA is attached to the permit. Where necessary, the Take 5 risk assessment and JHAs are completed on a task by task basis and includes hazard identification, risk assessment and control measures including any PPE requirements.

GSWL has prepared Change Management Request Form CM 001, which replaced Procedure PM No. 039 and identifies any changes in processes or operations and assesses the area to be affected, the potential impacts and documents proposed actions. Use of the form applies where there is any proposed process and operational changes and modifications that impact on worker Health or Safety or increases the potential for the release of cyanide. The form provides an assessment matrix to define the potential outcome of actions depending on the level of consequence and likelihood of outcome, and is provided to the ICMC Coordinator, Safety, Environment, Engineering, Maintenance, Electrical departments including the respective Head of Department for approval and signing off. The form will also be provided to the Civil Contractor representative. For general projects, a project meeting is held with participation from the ICMC Coordinator.

GSR place a high priority on worker safety and have a duty of care under GSR's health and safety policy and Ghanaian labour legislation to the health and safety of their workers. Integral to this process is soliciting feedback from workers through a number of different mechanisms. Workers are actively encouraged to provide feedback to their Supervisors at pre shift meetings, daily safety briefings chaired by the Safety Department and at monthly safety meetings provided to various departments. The monthly safety meeting is a forum where specific safety topics are presented for discussion. Review of the March 2016 safety meeting records showed the topic for discussion involved the "five S's" of safety. Other forums for worker feedback include an onsite suggestion box and the use of an online web based system www.reportit.net where issues can be relayed anonymously and may be escalated to senior

management for their evaluation and appropriate action. Where work procedures are allocated, workers are required to sign off on understanding of the task and any related health and safety issues. At this point any clarifications on procedures and opportunities for improvement can be discussed by the worker(s) in question.

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:

GSWL has determined that process solutions must be maintained at pH >10 to prevent the generation of HCN gas. Signs are posted at Mill cyanide dosing points and the upper deck of the CIL tanks notifying operators to maintain pH above 10. Concentrations of HCN gas recorded on personal monitors are recorded daily in a log book. The CIL pH is calibrated daily and noted in a log book. Operators also monitor the pH of CIL tank #1 hourly with other CIL tanks monitored every 2 hours with results noted on a daily log sheets. Tank #1 pH is maintained above 10 through the addition of lime.
During preparation of reagent cyanide solution, Procedure PM 002 – Cyanide Mixing Procedure and PM No. 003 – Ensure Right pH During Stock Cyanide Mixing, pH in the pre-mix water is required to be at pH > 12 prior to the addition of sodium cyanide into the mix tank. The pH of pre-mix water is recorded in a log book.

GSWL has also identified areas where there is a potential for hydrogen cyanide (HCN) generation and has installed fixed HCN monitors in those areas. The monitors are calibrated to trigger both audible and visual alarms when HCN gas concentrations exceed 4.7 ppm and 10 ppm. Fixed monitors comprising MSA Prima XP units are located at the mill mix plant, CIL feed hopper, above CIL Tank #1, carbon recovery screen and the PRF hopper. A HCN monitor installed at the CIL mix plant comprises a D-Guard monitor and at the time of the field audit was not in use since this mix plant was not in operation. Operators monitor HCN levels at the tailings hopper, carbon safety screen CIL Tank #6 every 2 hours and record the levels in the daily log. Hourly recordings are undertaken at CIL Tank #1. GSWL also continues to monitor HCN levels at different areas of the plant on a weekly schedule (including feed hopper, CIL plant, tailings hopper, cyanide storage area, mix and dosing areas, strip solution area, metallurgical laboratory, and assay laboratory) to evaluate changes in potential risk. Records of weekly HCN monitoring were available for the past three years.

Operations and maintenance workers working in areas where there is a potential for exposure to HCN gas or dust are required to make use of personal HCN monitors. In addition Procedure PM No. 18 – HCN Excursions above 10 ppm details actions to be taken in the event that elevated HCN concentrations are detected. Tasks and areas where workers may be exposed to cyanide have been identified and operating procedures implemented that identify the type of PPE required for a given task. Additionally procedures specify the use of personal HCN

monitors when working on tasks or in areas that may result in exposure to HCN gas. Training on the use of monitors and PPE is also provided.

Personal monitors are calibrated to signal an alarm at 4.7 ppm and 10 ppm levels of HCN gas. Procedure PM 018 Hydrogen Cyanide (HCN) Excursions Above 10 ppm requires that that if the 10 ppm alarm is triggered that workers will leave the area immediately, the elevated HCN levels are reported immediately to a supervisor and/or Plant Superintendent, and that the source of the HCN gas is identified and made safe. Where workers are required to remain in areas where HCN gas is above 10 ppm, the use of self-contained breathing apparatus (SCBA) is necessary.

GSWL hydrogen cyanide fixed monitoring equipment currently comprises 6 MSA Prima XP units which are inspected and calibrated on a six monthly basis by FINCOS Resources & Service Ltd. Calibration records were present from 2014 through 2016. Personal HCN monitors comprise three Altair Pro devices and an MSA Altair 5 multigas monitors. Calibration frequency is also tracked through the preventative maintenance system.

Warning signage has been placed throughout the facility and are prominently displayed in areas were cyanide is used, stored or forms part of the process. Since the 2012 audit, signs have been refreshed to improve legibility. Warning signage is displayed within the mill mix area and the mill and CIL cyanide dosing tanks. Cyanide reagent piping within the Mill and CIL plant is colour coded purple and labelled as containing cyanide. Cyanide mix and storage tanks are also labelled as containing cyanide. Signs warning of possible HCN are located in areas where there is a potential for elevated HCN gas levels. Signage warning of cyanide and the flow direction is displayed along the route of the PRF pipeline. Signage has been placed on the first steel section of pipeline, the pipeline route towards the CIL Plant and the road gantry crossing point into the CIL Plant.

A roofed cyanide storage compound has been constructed to the west of the Mill and cyanide warning signage is prominently displayed and storage areas for unused sodium cyanide boxes and used sodium cyanide packaging clearly displayed. "No smoking, eating and drinking" signs are prominently displayed in areas where cyanide is used or handled. Cyanide warning signage is also located at regular intervals along the TSF embankment.

Shower and eyewash stations are located at key locations in the plant where cyanide is used. The locations have remained unchanged since the 2012 recertification audit with the exception of a new shower and eyewash station installed at the current cyanide storage area. Areas where emergency showers are located include the mill cyanide mixing area, beneath the mill cyanide dosing tank, at the decommissioned CIL plant mixing area, the deck above the cyanide CIL tanks and adjacent to the new CN storage shed. The shower and eyewash station arrangement located at the CIL plant mixing area has been strengthened with the replacement of vertical sections of plastic piping with metal sections. In spite of the CIL plant mix area remaining out of use, the shower has remained in service in anticipation that the area may be recommissioned in future.

Fire extinguishers are located throughout the plant and those present in areas where cyanide is used or handled are of the dry powder type and non-acidic. Fire extinguishers are inspected monthly by GSWL and serviced every six months by an external servicing contractor.

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Material Safety Data Sheets (MSDS) are placed throughout the plant in key areas where cyanide is managed such as the cyanide store, mixing area and CIL plant. Induction training includes chemical hazards such as cyanide and is provided to all new employees. Training is also provided on MSDS as part of general cyanide training. Information boards providing safety instructions for the handling of cyanide are also displayed at strategic locations such as the mixing plant and CIL plant. Training and cyanide information including procedures, signage and information boards is provided in English within the plant. For the small number of illiterate workers, training information is provided verbally and supported by pictorial signage warning of hazards and indicating mandatory PPE requirements. First aid procedures are provided on the safety instructions for the handling cyanide posted around site and provided in the Consolidated Emergency Response Plan (CERP).

GSWL incident reporting procedures requires that any incident is immediately reported to a supervisor who is responsible for completing an incident reporting form. The incident form is entered into an electronic tracking system and actions tasked. Subsequent investigations and corrective actions implemented would be loaded onto INX, an electronic information database and tracking system.

Two cyanide related incidents are reported by GSWL since the 2012 recertification audit, the most recent occurring on 23rd April 2015. The incident related to a release of cyanide containing slurry from the PRF pipeline transporting slurry from the mill to the CIL plant, into the mill Anti-pollution Pond. The PRF pipeline feed was stopped and the pipelines flushed for 20 minutes before completing repairs to the PRF pipeline. The antipollution pond was cleaned using Procedure 034. The incident report recommended replacement of this section of pipeline due to this incident being the second recorded failure, the first occurring on 26th May 2014. The incident reporting system also notes one first aid incident in 2014 where cyanide solution splashed onto a reagent operators full face mask during the preparation of cyanide solution. The incident was reported as requiring first aid but not hospitalization.

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:

Emergency showers and eye wash stations are located at strategic areas within the plant including in areas where cyanide related tasks are undertaken. Oxygen resuscitator kits (Life Oxygen Pac kits) are located in the ambulance, at the clinic, the process plant control room, the mill emergency response store, Emergency Response Centre and training room. Cyanide antidote hydroxocobalamin kits (Cyanokits) are stored at the Akyempim Clinic located approximately 1 km from the plant. Cyanokits are stored in an air-conditioned room which is temperature controlled to <25°C and generally a stock level of four is retained. The Cyanokits

were all within their expiry dates. Communication within the plant is by portable radio, cellular telephones and a Gi-Tronics radio system. When present in other areas of the plant, workers communicate by means of portable radios and cellular telephones.

GSWL conducts regular inspections on emergency response and first aid equipment. Checks are undertaken monthly by the Emergency Response Coordinator and includes inspections of first aid kits, oxygen resuscitator kits. Emergency showers are checked weekly as part of a preventive maintenance programme with the monthly follows ups also undertaken by Safety Officers under the guidance of the ICMC Coordinator. Cylinder pressures in Self Contained Breathing Apparatus (SCBA) devices are inspected daily by members of the ERT.
Responsibility for maintaining Cyanokit stocks lies with the Clinic. Cyanokits are stored within a climate controlled air conditioned room with temperature checked twice daily by the pharmacist. Inspection of the Cyanokits confirmed that all kits were within the expiry date of August 2016.

The GSWL CERP (2016) is the overarching emergency response document which applies to all aspects of operations including exploration, mining, the processing plant, maintenance and administration. The CERP consolidates all previous emergency response documentation into a single document. The document includes procedures and responses in the event of cyanide releases including roles and responsibilities, initial response activities, first aid and various emergency scenarios. Scenarios include releases of HCN gas, liquid cyanide spills, spillage from infrastructure (pipes, valves and tanks), tailings embankment failures, overtopping of tailings dams, fires involving cyanide, cyanide poisoning, power outages and transportation emergencies.

The CERP has been developed in consultation with various stakeholders including the ICMC Coordinator, Safety Department, Emergency Response Unit, Heads of Department, the General Manager, site security and the medical clinic.

All workers are trained in cyanide awareness including, cyanide hazards, recognition of the effects of cyanide exposure, application of first aid and the use of resuscitation kits.
Responsibility for application of cyanide poisoning antidote hydroxocobalamin is allocated to medical doctor residing in the nearby Akyempim Clinic.

ISOS has been contracted to provide onsite medical services including for trauma stabilisation and evacuations. The contract is dated July 2015 and expires in July 2017. The clinic is located less than 5 minutes journey from Wassa Mine and has a staff complement of two Doctors, five Nurses, one Pharmacist, a Laboratory technician and a Hygienist. All staff are trained to respond to cyanide emergencies and the clinic has developed specific procedures to deal with cyanide exposures which are displayed within the emergency room.
A dedicated ambulance located at the Emergency Response Centre to provide immediate response and transport to the clinic. Weekly equipment and sanitary condition inspections of the onsite ambulance are undertaken by a clinic nurse.

GSWL operates an ambulance which located at the Emergency Response Centre and is on 24 hour standby. In the event of an emergency, the ambulance will transport any casualties to the nearby Akyempim Clinic. Equipment stored within the ambulance includes medical oxygen

and first aid equipment. For patients requiring onward care, the clinic can refer patients to other doctors, specialists or other medical facilities in Tarkwa, Accra or Komasi should the need arise. The clinic has staff available on call 24 hours a day and has a dedicated radio assigned to provide warning of any emergencies that may arise. In the event of a cyanide related emergency, ISOS would contact their head office in Paris, France to confirm the course of action taken. Should further patient treatment be required at ISOS has arrangements with a number of medical professionals, specialists and medical facilities in Tarkwa, Accra or Komasi to which a patient could be referred.

Section 50.4 of the CERP requires that mock drills are carried out at least twice yearly to evaluate emergency procedures. Since the 2013 recertification audit, GSWL has completed several mock drills including scenarios of cyanide release.

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:

The latest versions of the CERP is dated 2016 and was developed in consultation with various stakeholders including the ICMC Coordinator, ICMC Coordinator, Safety Department, Heads of Department and Senior Management. The CERP consolidates all previous emergency response documentation into a single document. The document includes procedures and responses in the event of cyanide releases including roles and responsibilities, initial response activities, first aid and various emergency scenarios. Scenarios include releases of HCN gas, liquid cyanide spills, spillage from infrastructure (pipes, valves and tanks), tailings embankment failures, overtopping of tailings dams, fires involving cyanide, cyanide poisoning, power outages and transportation emergencies. Procedures for these scenarios have been developed and include allocation of responsibilities and instructions on actions to be taken in the event of an emergency. The procedures also consider communication channels with communities for the various scenarios. GSWL do not have heap leach facilities and therefore these are not addressed in the CERP. Similarly, the cyanide treatment/detoxification facility is also no longer in use and excluded from the CERP.

Allship is responsible for transportation emergencies and responses are detailed in the Allship Transport Management Plan for Cyanide dated June 2015 (ATMP). The plan considers the transport route and that cyanide will be in solid form. Section 2.2 of the ATMP details that the transportation route is by road with sodium cyanide transported in standard shipping containers secured with twist locks. Specifications for trailers and convoys are also indicated.

The condition of the proposed route is considered with the speed of the convoy to be adjusted depending on road conditions. Adverse weather conditions are also taken into account requiring the use of alternate routes, return to base, or a temporary halt is called.

GSWL will assist the transporter with road related emergencies and the CERP contains procedures in the event of an emergency on a public road or within the community. GSWL is also proactive in providing information and training to communities on actions and responses to be taken in the event of a cyanide spill.

The CERP sets out the general response to all emergencies in the form of flow charts providing the approach for both the processes and procedures to be followed. The procedure requires the first responder to inform a supervisor and/or contact the Emergency Response Centre (ERC) by phone or on radio Channel 2. The first respondent to an incident is instructed to report basic information to the plant control room/ERC and if safe to do so, secure the scene and provide first aid if trained to do so. The roles and responsibilities of various emergency responders including the first responder, Plant Control Room, Shift Supervisor, Emergency Control Room, Emergency Response Coordinator, Plant Superintendent, Shift Commander, Emergency Response Team, Head of Department and Managing Director are defined in the CERP. Assigned roles and responsibilities during an emergency are also provided on duty cards which are distributed to the relevant personnel. Cyanide first aid procedures are presented in the CERP and require that any personnel affected by cyanide related medical emergencies are transported to the ISOS Clinic and administered cyanide antidotes by trained medical staff. Where communities may be affected by cyanide related spillages and emergencies, the Environment and Social Responsibility Manager or his designate are tasked with contacting community leaders within the designated catchment area. In the event of a cyanide release to water resources, the Community Relations Officer and ERT members are required to dye receiving waters and inform communities of potential dangers that may arise from affected waters. For any transportation emergencies, the CERP requires that anyone arriving at the scene is tasked with warning spectators of dangers and to keep clear of the incident.

The CERP provides emergency procedures for various cyanide related emergency scenarios including accidental releases of small, medium and large quantities of cyanide, release of hydrogen cyanide, explosions and fires, pipe ruptures, valve failures, tank ruptures, overtopping of ponds and impoundments. Procedures include the evacuation, isolation and control of spillages, detoxification and remedial measures, and communication steps with outside agencies and authorities.

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:

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The 2016 version of the CERP has been developed with input from GSWL stakeholders including the ICMC Coordinator, Safety Department, Emergency Response Unit, Heads of Department, the General Manager, site security and ISOS who operate the medical clinic. The Environment and Social Responsibility team has also provided input into the CERP and are actively engaged with providing cyanide related awareness information and training to external stakeholders and communities. Stakeholders include community leaders, teachers and school children. Awareness training includes information on emergency response actions that would be undertaken in the event of a cyanide incident at the mine or on a transportation route. The role of the community in reporting emergencies and actions to be taken such as avoiding the area of a spill or release are also included in awareness training.
Two mock drills simulating transportation incidents and the release of cyanide were undertaken in February 2013 and February 2014. The mock drills included engagement with the community through Committee Forums and cyanide awareness discussions.
GSWL has a standing agreement with the Akyempim Police (dated July 2012) for the provision of crowd and traffic control in the event of an emergency. The agreement is confirmed as current and any changes to the CERP and the Police's role would be communicated either verbally or in writing. A standing agreement is not in place with external fire services since GSWL has their own firefighting capability.

The Environment and Social Responsibility (ESR) Department maintains a strong community outreach programme based around three principal areas of engagement. These are:

- Community Consultation Team (CCT) meetings, conducted monthly with community representatives including community based organisations such as youth and farmer associations. The meetings are conducted with the six communities located within the mine catchment area with cyanide management related topics presented at least once annually. CCT meetings minutes are recorded and retained by the ESR Department.

- Mock drills including transportation emergency scenarios are undertaken with the involvement of communities though a Committee Forum to provide awareness. In advance of a mock drill, forums are held which are attended by communities including school children and educates communities on cyanide awareness such as the meaning of signage and control symbols, and responses in the event of a cyanide related emergency.

- Cyanide awareness training is provided to communities in both English and Twi (the local language) and is presented on fliers/brochures distributed to the community, power point presentations and laminated presentation cards. Training includes community response and roles in the event of potential cyanide release emergencies, emergency contact phone numbers and cyanide exposure routes. Awareness training is provided at least once on an annual basis.

In addition to the above meetings, GSWL hosts quarterly Community Mine Consultative Committee (CMCC) meetings whereby community leaders meet with the Community Relations Section to discuss any pertinent issues of concern to the Communities. GSWL has hosted community visits to the mine in 2013, 2014 and 2015 to the tailings facility to provide an explanation of TSF rehabilitation. During these visits, discussions are also held around topics of cyanide management.

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GSWL has an established standing agreement with the Akyempim Police most recently reaffirmed in a letter dated 20 July 2012 from the Office of the Inspector Ghana (Police Service Akyempim) confirming the role of the police in crowd and traffic control in the event of an emergency including cyanide related emergencies. GSWL has its own firefighting capability and as such does not have a standing agreement with external fire services, however the CERP does indicate that external fire services may also be engaged during fire emergencies depending on the severity of the incident.
ISOS has been contracted to provide onsite medial services including for trauma stabilisation and evacuations. The contract is dated July 2015 and expires in July 2017. The clinic is located less than 5 minutes road journey from Wassa Mine and has a staff complement of two Doctors, five Nurses, one Pharmacist, a Laboratory technician and a Hygienist. The clinic retains the hydroxocobalamin antidotes (Cyanokits) for application as required. All staff are trained to respond to cyanide emergencies and the clinic has developed specific procedures to deal with cyanide exposures which are displayed within the emergency room.

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 designates the respective Department Manager as the Emergency Coordinator. In the event of electrical, mechanical or structural failures, the Engineering Manager or his designate shall be the Emergency Coordinator. In the event of medical evacuation, the Medical Doctor shall assume control of the emergency coordination at the ISOS Clinic. The Emergency Coordinator has authority to act as an Emergency Response Team (ERT) Captain and has authority to setup temporary emergency control centres, stop all work and evacuate all employees and contractors.

The CERP also provides a list of key personnel including telephone numbers to contact in the event of an emergency. The roles and responsibilities of key personnel responding to emergencies are defined in the CERP and on duty cards provided to appointed personnel. ERT members and contact telephone numbers are identified in the CERP. The ERT currently comprises 10 permanent full time members with an additional 15 members to be added in future to form resources for a mine wide Rescue Centre. The ERT is coordinated and managed by an Emergency Response Coordinator and during an emergency an ERT Captain. The CERP requires that the ERT be provided with appropriate training and equipment and assigns the General Manager as being responsible for ensuring that suitable training resources are available. It also provides a flowchart for callout procedures and a list of 24 hour contact information for key personnel and ERT Members. Appendix G contains an emergency call list

for incidents specifically for incidents involving sodium cyanide, and Appendix H of the CERP contains a list of emergency response equipment.

Roles and responsibilities of key personnel including ERT members, supervisors, coordinators, department heads, senior management, controllers and medical staff are detailed in the CERP and on duty cards provided to key personnel. The role of Akyempim Police to assist with crowd control and traffic incidents is outline in the CERP and is confirmed in a written standing agreement with the police.

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 CERP provides call out procedures for the identified responsible person to follow and depending on the type of emergency, which relevant internal and/or external persons or organisations to contact. The CERP also lists contact details for Emergency Response Team Members, Managers and Heads of Departments, corporate contacts, EPA, Inspector of Mines, environmental and mining regulators, the Police, the ISOS Clinic and external hospitals. Personnel responsible for making calls are identified in a flow chart contained within the CERP and communication requirements are also described in responsibilities detailed for the emergency response roles and within emergency response procedures.

Procedures and contact information for community representatives are provided within the CERP. The ESR Manager is responsible for contacting the relevant community representatives depending on the area of the incident.
Communications with the media is the responsibility of the Group Public Manager and in the event of an emergency will be kept up to date by the General 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:

Emergency response procedures listed in the CERP includes cyanide release scenarios such as catastrophic releases of hydrogen cyanide, liquid cyanide spills, spillage from infrastructure (pipes, valves and tank ruptures), removal of debris and clean-up of cyanide mixing tanks,

overtopping of tailings dams, fires involving cyanide, cyanide poisoning and cyanide exposures. The procedures describe the actions to be taken including callout and notifications, spill control, decontamination procedures, clean up/neutralization and disposal of contaminated soils and residual material to the tailings storage facility.
For certain emergency scenarios such as overtopping of cyanide ponds and impoundments and failure of tailings embankments, procedures require the provision of alternate sources of potable water to affected communities. CERP Procedure 26 (Accidental Release of Cyanide) and Emergency Responses to solid Cyanide Spillage into Wet Areas states that where spilled cyanide has the potential to reach surface water no sodium hypochlorite, ferrous sulphate and hydrogen peroxide is to be used during remedial activities.

The CERP contains procedures for soil sampling both before and after the clean-up of a cyanide spillage. For cyanide spillages to wet areas, the CERP requires that water samples are collected along the affected channel to a frequency comparable to the spillage and regulatory agencies are to be informed with results made as public as possible. Where uncontrolled seepages occur from tailings dams, downgradient water samples are to be analysed for free cyanide and compared against an action value of 0.022 mg/l. Regulatory agencies are to be informed depending on the severity of seepage and impact.

Specific surface groundwater sampling procedures also provide instructions on obtaining representative samples, calibration of field equipment, sampling procedures, collection of field data, sample identification, chain of custody documentation, quality controls, collection of field blanks and duplicates, sample preservation, shipment procedures, analytical requirements and data management. Depending on the severity of an incident, the Environmental Superintendent would also provide further instruction on suitable sampling locations and the number of representative samples to be collected depending on the nature of the event.

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:

Section 17 of the CERP requires that a review is conducted at least annually or at any time a major change occurs such as introduction of new technology, equipment, training methods, processes or physical, structural or layout changes. Additionally any recommendations arising from emergency drills, actual emergencies, debriefings or reviews requires revision of the CERP.
The CERP requires that mock drills are periodically undertaken with a frequency of at least twice yearly to evaluate emergency response procedures. The mock drills include ERT members, employees undertaking cyanide related tasks, the Environmental Department, management, ISOS staff and outside responders. The outcomes of drills are used to revise emergency response procedures as required.

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Since the 2012 recertification audit, GSWL has conducted seven mock drills, five of which have considered cyanide related emergency scenarios. The mock drills were evaluated by assessors who provide feedback during debriefing sessions. Any recommended changes to standard operating procedures or the CERP are noted and incorporated as required by the CERP review procedure. As discussed in 6.3, mock drills are conducted at least twice yearly; since the 2012 recertification audit, GSWL has completed five emergency drills with cyanide related scenarios. The CERP is required to be reviewed least annually or at any time a major change occurs such as introduction of new technology, equipment, training methods, processes or physical, structural or layout changes. Additionally any recommendations arising from emergency drills, actual emergencies, debriefings or reviews require revision of the CERP.

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:

Site induction is mandatory for all employees, contractors and visitors entering the site. Site induction training includes topics such as site policies, procedures, site safety, signage, mandatory PPE, and emergency response. Cyanide awareness is included as a training module. New employees are required to complete plant induction training and general cyanide awareness training which includes forms of cyanide, recognition, hazards, signage, safe handling guidelines, exposure routes, control of the generation of HCN gas, symptoms of cyanide poisoning, first aid treatment in the event of exposure.

Employees specifically working or engaged on cyanide related tasks are required to complete additional cyanide awareness modules and training on specific cyanide related operating procedures. These include emergency procedures, cyanide offloading and mixing procedure, oxygen resuscitation kit operation, expiry dates for HCN gas canisters, cyanide facility inspections, working on cyanide pump/valve/pipeline/tank, cyanide dosing pump operation, wet and dry sodium cyanide decontamination and TSF training. Training has been provided by the ICMC Coordinator and an Orica representative authorised to deliver Orica's Cyanide Awareness Training Program.

Cyanide refresher training is also mandatory for all employees and is undertaken at least annually including immediately upon return of employees from annual leave. Training records are retained by the Safety Department and ICMC Coordinator and includes attendance sheets. Cyanide specific training is provided by the ICMC Coordinator and a trainer provided by Orica. Cyanide training records including attendance and sign in sheets are noted in log books or filed as paper copies. Training is provided by the Safety Department, ICMC Coordinator and

an external Orica provided trainer as required. Training needs are tracked on a training matrix updated by the ICMC Coordinator and Safety Department with induction records retained by the Safety Department.

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 workers that undertake cyanide related tasks are required to complete cyanide awareness training as well as task specific training. Task related cyanide and awareness training specific to the plant is provided by the ICMC Coordinator since 2013. The trainer has a BSc in Mineral Engineering and has responsibility for coordinating training within the plant. He has been employed at GSWL since 2008 and is therefore experienced in plant operations.
Periodic cyanide training has been provided by Orica to workers on general aspects of cyanide management. The Orica trainer is the country representative for Orica in Ghana. Induction, first aid and emergency response training is provided by safety department trainers under the guidance of the Health and Safety Superintendent. He has been employed at GSWL since 2007 before which he was employed as an Occupational Health and Safety Officer also within the mining industry (Goldfields). The first aid trainers have life time first aid certificates issued by the St John's ambulance service and have completed the St John's train the trainer courses. The Emergency Response Coordinator provides training to ERT Members, is professionally trained, and has 20 years' experience as a fire drill instructor, fire fighter, and fire safety officer with the Ghana National Fire Service.

New employees are required to complete mandatory Health and Safety induction, Plant Induction and cyanide awareness training before being allowed to work within the plant. Task specific training is also required to be completed before undertaking cyanide related tasks and is enforceable by supervisors and the ICMC Coordinator. The ICMC Coordinator also undertakes pre work task observations to ensure employee understanding of task and operating procedures.

Employees undertaking induction, safety, cyanide awareness and task specific training are required to complete and pass a written test to demonstrate understanding of the training content and topics. Employees that do not demonstrate proficiency are required to revisit training. Supervisors, safety offices and the ICMC Coordinator are required to complete a minimum number of task observations monthly on a pre-planned schedule which includes operating procedures for the plant and the TSF. The ICMC Coordinator undertakes a review of plant employee tasks against operating procedures and reviews findings with the individual workers. Since 2015, the ICMC Coordinator has implemented monthly internal ICMC focussed audits with any subsequent findings or remedial actions provided to Heads of Department for implementation.

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Induction, initial training and refresher training records are retained on file by the safety department, with records indicating the name of the trainer, trainee and the topics presented. Cyanide awareness training specific to the Plant is retained on record by the ICMC Coordinator and includes information on the trainer, trainee and topics covered. Training matrices also provide a record of individuals trained as well as topics. Examination forms are also retained on record by the Safety Department and the ICMC Coordinator. All training records are retained for the duration of the individual's employment.

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:

Both general induction and plant induction training provided to employees provide instructions to be followed in the event of an incident involving sodium cyanide. The induction materials also includes a description of solid and gaseous cyanide, safe handling guidelines, exposure routes, symptoms of cyanide poisoning, incident management, emergency call out procedures and first aid treatment including administering oxygen and decontamination steps. Employees undertaking cyanide specific tasks receive task specific training on standard operating procedures for that task as well as procedures to follow in the event of a cyanide exposure. Procedures also contain decontamination steps to be followed in the event of a wet or dry cyanide spill. The ERT team members receive the same training as above and also conduct at least two mock emergency drills per annum. As described in 6.3(7), since 2013, GSWL has conducted five mock drills which include cyanide emergency related scenarios.

The Emergency Response Coordinator undertakes weekly meetings with the ERT whereby a range of topics are covered including emergency call out procedures, cyanide awareness and management, first aid procedures, and cyanide exposures. Weekly briefings discussing topics contained within the CERP are held between the Emergency Response Coordinator and ERT members and include responses to cyanide related emergency scenarios. Topics discussed in weekly training sessions include evacuation drills, hazardous materials handling, fire extinguisher use, basic firefighting, cyanide management, basic first aid and mock drill rehearsal. In addition, cyanide awareness and refresher training is periodically provided by the ICMC Coordinator to ERT members in accordance with a training matrix. Ambulance drivers are provided with weekly equipment training from the ISOS Clinic nurses. Minimum training requirements for the ERT members are also detailed within the CERP comprising rescue operations, handling of cyanide exposure victims, first aid, ambulance operations and firefighting. All of these requirements are addressed by GSWL's training and refresher programmes. ISOS has been contracted to provide onsite medical services for cyanide related incidents and retain a copy of the CERP detailing their responsibilities relating to cyanide emergencies. GSWL has a formal arrangement with Akyempim Police for provision of traffic

and crowd control in the event of a cyanide incident occurring during transportation. Both the ISOS Clinic and Police have been engaged in mock drill exercises depending on the scenario.

Community stakeholders have been provided with cyanide awareness and emergency response training and community leaders have been provided with contact phone numbers in the event of a cyanide emergency. GSWL maintains a strong community outreach programme and this consultative process ensures that key community members are aware of the cyanide related elements of the CERP. Communities are also engaged in mock drills which consider transportation emergencies and the role of the community in such incidents.

Cyanide refresher training is mandatory for all employees and is completed at least annually. Training records are retained by the Safety Department and ICMC Coordinator, both electronically and in hard copy files, with training needs also tracked on a training matrix. Training modules include responses to cyanide exposures and procedures to be followed in the event of a cyanide release. The ERT also undertakes mock drills at least twice yearly which includes cyanide related emergencies and release scenarios. The CERP requires that the outcomes of mock drills are used to aid in the revision of emergency response procedures. The mock drills were evaluated by assessors who provide feedback during debriefing sessions. Any recommended changes to procedures or the CERP are noted and incorporated as required by review procedures. Records reviewed from 2013 through to 2015 confirm that corrective actions were identified following the mock drills and implemented as follow up training exercises or entered into an electronic system (INX) to allocate and track corrective actions.

GSWL retains training records with the name of the trainer, trainee and the topics presented also noted. Training requirements are tracked on training matrixes retained by the Safety Department and the ICMC Coordinator. Trainees are required to demonstrate an understanding of the training material and complete a written test. Signed completion sheets and test results are retained on record.

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:

Since the 2012 audit GSWL continues to maintain a strong community outreach programme which is managed through the Community Relations Section of the Environment and Social Responsibility (ESR) Department. The ESR Department engages with local communities at several different forums including monthly meetings held by GSWLs Community Consultation Team and attended by community based organisations. Educational programmes, awareness

training and emergency response training is provided to communities including to schools in the catchment area on an annual basis. In addition, GSWL hosts quarterly Community Mine Consultative Committee (CMCC) meetings whereby community leaders meet with the Community Relations Section to discuss any pertinent issues of concern to the Communities. Communities are also engaged in mock drill scenarios where these consider emergencies along the cyanide route. Communities are engaged prior to the mock drill to explain the scenario being considered and actions to be taken. Outcomes of the drill are then reported back to the community. These various forums provide an opportunity for communities to express areas of concern including cyanide management to GSWL. GSWL also maintains a complaints communication system to address community concerns. The community can contact GSWL by phone, fax email, letter or in their personal capacity at the GSWL administration buildings. Issues may also be raised during any community meetings. All complaints are recorded on a complaints registration form which is then submitted to the ESR Manager for action. The enquiry or complaint is then provided to General Manager or other departments depending on the nature of the complaint. The issue is tracked on a database with the CSR being responsible for responding to the enquiry or complaints and monitoring the progress of any actions. The database records a unique ID for each issue, the date of complaint, complainant name, the community in question, a description of the complaint, the current status of investigations, responsible person for actions, the planned completion date, and the resolution date. Since the 2012 audit, there have been no reported complaints relating to cyanide. One complaint received on 27/102015 related to expansion of the TSF affecting the only source of water for a nearby resident. The investigation identified that construction works had disturbed the source of the stream and subsequent corrective actions involved the construction of a reservoir and pump at the source of the stream for the complainant.

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 continues to operate and maintain a strong community outreach programme and makes use of a number of interactive forums to provide information and training programs related to cyanide management practices and procedures. GSWL provides a dedicated Community Relations Section, a subsection of the ESR Department to manage community interactions. GSWL engages with local communities at several different forums including monthly meetings held by GSWLs Community Consultation Team and attended by community based organisations. Educational programmes, awareness training and emergency response training is provided to communities including schools in the catchment area on an annual basis. Training materials are provided in both English and the local language Twi. GSWL has also produced education materials in the form of a flyer/brochure, power point presentations and laminated information cards. In addition, GSWL hosts quarterly Community Mine Consultative

Committee (CMCC) meetings whereby community leaders meet with the Community Relations Section to discuss any pertinent issues of concern to the Communities.
Communities are also engaged in mock drill scenarios to provide awareness to communities on actions to be taken in the event of a cyanide emergency. GSWL has hosted community visits to the mine to provide an explanation of TSF rehabilitation. During these visits, discussions are also held around topics of cyanide management within plant operations. Community visits were arranged in 2012, 2013, 2014 and most recently in October 2015.

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

The operation is:
- [x] in full compliance
- [ ] in substantial compliance
- [ ] not in compliance…with Standard of Practice 9.3.

Describe the basis for the Finding/Deficiencies Identified:

Written material describing cyanide management is provided in flyers providing emergency response information for local communities in both English and the local language Twi. Cyanide awareness training is also provided in the form of Powerpoint presentations with content similar to that provided in Plant cyanide awareness training. Laminated hard copies of the presentation are also provided to communities. Cyanide awareness materials are provided to attendees who are encouraged to share materials with communities. The GSWL outreach program also relies on community leaders to disseminate information and are provided information brochures and hard copies of cyanide related training information.

GSWL also has an environmental incident classification and reporting procedure which defines and classifies incidents on the basis of five levels. GSWL has committed to reporting any level 3 (e.g. tailings spill, exceedance of water quality standards, limited groundwater pollution, persistent groundwater contamination), level 4 (e.g. groundwater pollution with potential for serious biological damage, contamination of potentially potable groundwater sources) or level 5 incidents (major tailings dam failure, contamination of potable groundwater sources and discharge of tailings or CN contaminated water to uncontrolled surface water systems) to the relevant regulators (Environment Protection Agency and the Inspectorate of Mines) and at a GSR Corporate level. The GSR Incident Management Standard (2014) also defines and classifies incidents with respect to injuries and assigns a level of 1 to 5 depending on the impact severity to health or safety. As for environmental incidents, incident notification to GSWL Management is required for Level 3 to Level 5 classified Health and Safety Incidents. The standard also requires that all fatalities, serious injuries and dangerous occurrences (including Level 3, 4 and 5 environmental incidents) are reported to the Chief Inspector of Mines to meet the requirements of Section 26 of the Ghana Mining Regulations (2012). The incident reporting processes would include reporting on the cyanide release or exposure scenarios indicated in (a) through to (e) below.

Monthly environmental monitoring data are submitted to the Ghana EPA as part of the EPA AKOBEN programme which evaluates GSWL environmental performance. Performance ratings

are posted on the EPA webpage and are available for public viewing. GSWL has achieved an overall Blue (Good Performance) environmental rating for 2013 and 2014. A Gold (Excellent) rating was achieved for Corporate Social Responsibility for both years. Data for the 2015 review period was not yet available for review. In addition to the lines of communication established through GSWL's outreach programme and established lines of communication with regulatory authorities, GSR has also committed to publish annual reports on environmental and safety performance. Information on health and safety (Lost Time Injury Frequency Rates), and environmental performance indicators (e.g. percentage of water samples within guidelines) is provided within the sustainability report. Other information contained in the sustainability report includes a summary of GSR's goals and progress, environmental initiatives, community relations and development, health and safety initiatives, local employment and content initiatives and economic development initiatives, social At the time of the audit, the 2015 sustainability report was in preparation and had not yet been published.

Review of incident records from 2013 through to 2016 indicate that there have been no cyanide exposure incidents or fatalities have occurred since the 2012 recertification audit. However, should any such releases occur, the reporting protocols as described above would apply. One first aid incident is noted as recorded on the GSR Incident reporting system. On 15/09/2014 cyanide solution splashed onto a reagent operators full face mask during the preparation of cyanide solution; however hospitalization was not required.
GSWL has reported no cyanide releases either on or off the mine site that has resulted in significant adverse effects to health or the environment. Incident records reviewed from 2013 through to 2016 identified confirmed that no such release scenarios have occurred. No cyanide releases have occurred since the 2012 recertification audit that have caused the applicable limits for cyanide to be exceeded.

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