



**REPORT**

# ICMI GOLD MINE RECERTIFICATION AUDIT - SUMMARY REPORT

*Newmont Ghana - Ahafo Gold Mine*

Submitted to:

**International Cyanide Management Institute (ICMI)**

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Washington, DC, 20005,  
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Submitted by:

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## 1.0 SUMMARY AUDIT REPORT FOR GOLD MINING OPERATIONS

**Name of Cyanide User Facility:** Ahafo Gold Mine

**Name of Cyanide User Facility Owner:** Newmont Ghana

**Name of Cyanide User Facility Operator:** Newmont Ghana

**Name of Responsible Manager:** Okyere Ntrama  
General Manager

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## 2.0 LOCATION DETAIL AND DESCRIPTION OF OPERATION

Newmont's Ahafo Gold Mine is located in the Brong Ahafo region, approximately 307 km northwest from the national capital city of Accra. Commercial production at Ahafo began in 2006. Ahafo has two primary ore zones namely Ahafo South and Ahafo North. Mining is currently taking place at Ahafo South. Ahafo is primarily a surface mine with one underground portal.

The Ahafo Gold Plant consists of a conventional mill and carbon-in-leach (CIL) circuit. Ore from the mine workings is transported to a crushing, grinding and milling circuit. Ore processing consists of CIL cyanidation, elution and gold recovery. Tailings material is conveyed by pipeline to a counter-current decantation (CCD) plant where tailings are rinsed with water to reduce weak acid dissociable (WAD) cyanide concentrations to less than 50ppm WAD cyanide. The tailings are pumped from the CCD circuit via a dedicated pipeline contained within a lined tailings trench, to an engineered, tailings storage facility (TSF) for final disposal. Tailings water is

recovered from a decant pond, and recycled back to the process plant for re-use in the CCD circuit. Overflow water from the CCD and Leach Thickener is re-used in the milling circuit.

The Ahafo Gold Mine purchases sodium cyanide from Samsung C&T Deutschland and this cyanide is manufactured by Asahi Kasei Corporation, Japan and TongSuh Petrochemical Co., Ltd. manufacturing plant in Korea. The cyanide, in solid briquette form, is packaged in one tonne flexible intermediate bulk containers (FIBC) comprising poly-woven bags inside plywood boxes. The FIBCs are transported by sea in shipping containers to the port of Tema in Ghana from where the cyanide contained in the FIBC is removed and transferred to a tank container at the Vehrad Transportation and Haulage repackaging facility in Tema. The tank containers (Isotainers) are transported by road to Ahafo Gold Mine. The cyanide is delivered to the Ahafo Process Plant in dry briquette form, in truck-mounted isotainers, for solid to liquid sparging by Vehrad Transportation and Haulage.

Prior to the current contract with Samsung C&T Deutschland, cyanide was purchased from Orica's Yarwun production facility and delivered to the mine by Stellar Logistics via the Orica Mining Chemicals Bag to Bulk Transfer Facility in Tarkwa, Ghana.

During sparging, pH adjusted water from the mixing tank is continuously passed through the isotainer in a closed circuit until the cyanide has been dissolved and the required concentration of liquid cyanide is achieved. On completion of the sparging process, the liquid cyanide is transferred from the mixing tank to a dedicated storage tank ready for delivery by pipeline to the process plant.

## SUMMARY AUDIT REPORT

### Auditors Findings

in full compliance with  
 in substantial compliance with\* **The International Cyanide Management Code**  
 not in compliance with

**Newmont Ahafo Gold Plant is:**

**Audit Company:** Golder Associates Africa (Pty) Ltd  
**Audit Team Leader:** Marié Schlechter, Lead Auditor and Mine Technical Specialist  
**Email:** [mschlechter@golder.co.za](mailto:mschlechter@golder.co.za)

T This operation was found in substantial compliance with the Cyanide Code based on the audit findings discussed in this report under Standard of Practice 2.1.

No significant cyanide incidents or cyanide exposure incidents were noted as occurring during the recertification period.

\* The Corrective Action Plan (CAP), to bring an operation in substantial compliance into full compliance has been developed and implementation commenced. The CAP must be fully implemented within one year of the date of this audit.

### Name of Other Auditors

Benjamin Asiedu, Golder Ghana

Signature:

### Dates of Audit

The Re-certification Audit was undertaken between 6 and 9 September 2021.

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Mining Operations Verification Protocol and using standard and accepted practices for health, safety and environmental audits.

## PRINCIPLE 1 – PRODUCTION

### Encourage Responsible Cyanide Manufacturing by Purchasing from Manufacturers that Operate in a Safe and Environmentally Protective Manner

**Standard of Practice 1.1: Purchase cyanide from certified manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 1.1**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 1.1; to purchase cyanide from certified manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment.

The cyanide purchased is manufactured at facilities certified as being in compliance with the Code:

- Orica's Yarwun production facility is certified as being in full compliance with the Code on 17 September 2020 with the prior recertification being dated 22 February 2017.
- The cyanide is repackaged in Ghana prior to delivery to the site at the Orica Mining Chemicals Bag to Bulk Transfer Facility in Tarkwa, Ghana. The Orica Mining Chemicals Bag to Bulk Transfer Facility is certified as being in full compliance with the Code on 16 August 2021 with the prior recertification in 2018.

Samsung C and T Deutschland supplied Ahafo Gold Mine with sodium cyanide from the Asahi Kasei Corporation production facility in Japan and the Tongsoh Petrochemical Corporation., Ltd production facility in Korea.

- The Asahi Kasei Corporation production facility is certified as being in full compliance with the Code on 26 October 2018.
- The Tongsoh Petrochemical Corporation., Ltd production facility is certified as being in full compliance with the Code on 9 March 2020 with the prior recertification being dated March 2017.

The cyanide is repackaged in Ghana prior to delivery to the site at the Vehrad Transport & Haulage Repackaging Plant #2. The Vehrad Transport & Haulage Repackaging Plant #2 is certified as being in full compliance with the Code on 15 September 2021 with the prior recertification being dated January 2018.

## PRINCIPLE 2 – TRANSPORTATION

### Protect Communities and the Environment during Cyanide Transport

**Standard of Practice 2.1:** Require that cyanide is safely managed through the entire transportation and delivery process from the production facility to the mine by use of certified transport with clear lines of responsibility for safety, security, release prevention, training and emergency response.

in full compliance with

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

not in compliance with

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

The operation is in SUBSTANTIAL COMPLIANCE with Standard of Practice 2.1; require that cyanide is safely managed through the entire transportation and delivery process from the production facility to the mine by use of certified transport with clear lines of responsibility for safety, security, release prevention, training and emergency response.

Cyanide previously ordered from Orica was delivered to Ahafo Gold Mine via the Orica West Africa Supply Chain. The Orica West Africa Supply Chain includes ocean transport of cyanide by the Mediterranean Shipping Company, management of cyanide shipments at the Ports of Tema and Takoradi (Ghana) (amongst others) and road transportation in West Africa by Stellar Logistics and Allship Logistics. The Orica West Africa Supply Chain was recertified against the Code on 03 April 2018.

Stellar Logistics is a certified transporter under the Code, which includes transporting cyanide from the Port of Takoradi to the mines in Ghana. Stellar Logistics was recertified against the Code on 22 November 2021.

The Samsung Africa Supply Chain includes transport from manufacturers in Korea, TaeKwang Industrial Co., Ltd. and TongSuh Petrochemical Co., Ltd, using certified carriers SAM IK Logistics Co. Ltd. and Hae Dong Logistics to Pusan New Port, South Korea, followed by ocean transport by shipping companies MSC, Maersk and Safmarine to the Port of Tema (amongst others), followed by road transportation by, amongst others, Vehrad Transport and Haulage Ltd.

The Samsung Africa Supply Chain is a certified transporter under the Code and was recertified against the code on 15 June 2021.

Samsung uses subcontractors for the transportation of cyanide from the manufacturers to the Port of Tema to the mine. Currently Vehrad Transport and Haulage (re-certified 23 September 2021) is used to transport the sodium cyanide from the Port of Tema to Ahafo Gold Mine.

Vehrad Transport and Haulage is a certified transporter under the Code and was recertified against the code on 23 September 2021.

Samsung C&T Deutschland, the main cyanide supply contractor for Ahafo Gold Mine, also ordered cyanide, in addition to the cyanide delivered via the Samsung Africa Supply Chain, from July 2020 to date directly from Asahi Kasei Corporation in Japan to ensure a stable supply of cyanide to the mine.

The sodium cyanide purchased from Asahi Kasei Corporation in Japan is transported inland by the production facility itself, which is not certified against the Code (either as a signatory or via a third-party audit in terms of Code requirements), to the Port of Mizushima from where it is transported further by either Hapag-Lloyd or MSC to the port of Tema in Ghana. The cyanide is transported by Vehrad Transport and Haulage Ltd. from the port of Tema to Ahafo Gold Mine. There are currently no certified transporters in Japan.

The following actions have been agreed on between Ahafo Gold Mine and Samsung C&T Deutschland to ensure that all transportation entities used in transportation of cyanide to the mining operation be certified, either individually or as part of a certified transportation supply chain:

- Samsung has stopped all deliveries from Japan until the supply chain becomes International Cyanide Management Code (ICMC) compliant.
- Last shipment from Japan to Newmont was on 16 September 2021.
- Samsung has engaged Asahi Kasei Corporation in Japan to obtain ICMC certification.
- Samsung assured Newmont that the Korea plants, supplying cyanide via the certified Africa Supply Chain, has the capacity to support Ahafo Gold Mine.
- Samsung has commenced arrangements to compile all shipping documents per batch/consignment and send to Ahafo Gold Mine as evidence per the Corrective Action Plan (CAP).

The site is found in substantial compliance with the requirements of this question based on the consideration that the deficiency can be rectified with immediate effect by only procuring cyanide either via the certified Samsung Africa Supply Chain or via certified transporters or supply chains. This will be implemented in accordance with the actions agreed on between the lead auditor and the mine, as stated in the CAP.

The operation has chain of custody records identifying all the elements of the supply chain that handle the cyanide brought to Ahafo Gold Mine.

## PRINCIPLE 3 – HANDLING AND STORAGE

### Protect Workers and the Environment during Cyanide Handling and Storage

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

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 3.1**

not in compliance with

#### Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 3.1; design and construct unloading, storage and mixing facilities consistent with sound, accepted engineering practices, quality control/quality assurance procedures, spill prevention and spill containment measures.

The facilities for unloading, storing and mixing cyanide have been designed and constructed in accordance with cyanide producers' guidelines, applicable jurisdictional rules and/or other sound and accepted engineering practices for these facilities.

The cyanide reagent facility consists of sparge unloading area, sparge tank (also referred to as the cyanide mixing tank) and storage tank. The cyanide sparge and storage tanks were replaced in October 2020. The new tanks were constructed according to the specifications and drawings used for the original tanks and were inspected by an independent engineering consultant prior to commissioning.

Unloading and storage areas of solid cyanide are located away from people and surface waters. The cyanide sparging and storage area is located in a fenced area with one side adjacent to the boundary of the high security plant area. The closest building that is used and occupied is the security entry to the high security plant area and includes the security control room that is manned 24 hrs a day. The facility is approximately 30 meters from the reagent mixing area, in the same fenced area.

Liquid cyanide is unloaded during the sparging process on a concrete surface that can minimise seepage to the subsurface. The cyanide unloading area is constructed to contain, recover and allow remediation of any leakage from the tanker truck. The area is covered by concrete with humps on either side and a bund on the third side. The entire area slopes towards the cyanide storage area bund which will contain leakage from the tanker truck.

There is a method to prevent the overfilling of the cyanide sparging and storage tanks, such as a level indicator and high-level alarm. Field level display instruments are available and is confirmed by the process operator as per procedures and is also available in the control room on the Citect system. The level instrumentation and alarms are inspected and maintained within the SAP planned maintenance system.

The sparging tank and storage tank, within the sparging facility, are positioned on concrete ring beams with an high density polyethylene (HDPE) liner between the tank bottom and the top of the ring beam. The concrete secondary containment floor continues beneath the base of both ring beams.

Secondary containments for cyanide storage and mixing tanks are constructed of concrete, which provides a competent barrier to leakage. This was verified during the site visit. Observation of the bunded areas during the site visit showed the concrete bund floors and walls to be in good condition without visible cracks or other defects.

Solid cyanide is delivered to site using isotainers, which are sparged. Solid cyanide is not stored on site. The cyanide storage and sparge tanks are fitted with ventilation pipes at the top to prevent the build-up of HCN gas. The tanks are located outdoors. The cyanide sparge and storage area is fenced and equipped with gates that are locked as per procedure. Cyanide is stored separately from incompatible materials.

**Standard of Practice 3.2: Operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.**

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 3.2**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 3.2; operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

The operation uses a sparging system. Solid cyanide is delivered to the site in isotainers, which are not unloaded from the truck. Once sparging is complete, the isotainers are removed from site.

Following the sparging process the isotainer is subject to a rinsing sequence. The rinse water is sent to the sparging tank. The isotainer, coupling joints and hoses are also rinsed.

Procedures are in place that detail the operation of valves and couplings for unloading liquid cyanide and mixing solid or liquid cyanide.

If leaks or solution are observed, the procedure entails rinsing with water, which is drained into the reagent facility bund.

Procedures are in place, which state the required personal protective equipment (PPE) and that a second individual is required. Observers as well as the site emergency response team (ERT) with an emergency response vehicle are present during the sparging process.

Colorant is added to the isotainers by Vehrad Transportation and Haulage at the transfer facility in Tema prior to arriving on site.

## PRINCIPLE 4 – OPERATIONS

### Manage Cyanide Process Solutions and Waste Streams to Protect Human Health and the Environment

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 4.1**

not in compliance with

#### Summarise the basis for this Finding/Deficiencies Identified:

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

The operation has numerous cyanide specific procedures and plans, and numerous maintenance and operating procedures for cyanide facilities. These procedures are documented and controlled on the company intranet site and are readily retrievable if required by personnel.

Critical design parameters are referenced in the original design criteria as well as in various management plans, standard operating procedures, and standard task procedures.

Critical parameters include:

- The design or required freeboard for the TSF and event pond:
- The concentration of WAD cyanide discharge at the spigot;
- The design storm events for plant ponds and impoundments.
- pH in the sparging tank.
- pH in the thickener prior to addition of cyanide in the leach circuit.

These design criteria are reviewed and the associated documents are updated as and when required by changes to facilities, processes, and/or as part of incident reviews.

The operation has plans and procedures that describe the standard practices necessary for the safe and environmentally sound operation of the facility including the specific measures needed for compliance with the Code, such as water management, inspections and preventative maintenance activities.

Daily inspections including pre-start checks are conducted for each shift on each circuit. The following inspections are conducted:

- Reagent area daily inspection
- Pre-leach and CIL daily inspection
- Elution daily inspection
- CCD daily inspection
- Grinding area

- Tailings Storage Facility / Water Storage Facility (WSF) daily inspection

In addition to the shift inspections, formal monthly inspections are conducted across all areas of the plant using a cross-functional team of inspectors comprising plant operations, metallurgy, maintenance, environmental, health and safety, and contractors. Specific plant facilities including the TSF, Event Pond, Process and Raw Water Ponds are inspected on a more regular basis as provided for in the inspection schedule.

The operation has a procedure to identify when changes in a site's processes or operating practices may increase the potential for the release of cyanide and to incorporate the necessary release prevention measures. The guideline provides a recommended and systematic approach to ensure changes that impact safety, health, environment, external relations or productivity are identified, assessed, managed and appropriately communicated to all affected personnel.

The operation has developed a number of procedures for contingencies and non-standard operating conditions, including upset in water balance, corrective action, and either planned or emergency shutdowns. Examples of upset conditions include upsets in water balance, identified leakages, and/or plant shutdowns. Contingency procedures for these types of conditions in critical areas are provided for in the following documents:

- Plant shutdown procedures
- Water management procedures
- Pond management procedures

Additional potential upset conditions are covered in the site Emergency Management Plans. The Process Plant Shutdown procedure makes provision for both when short term and longer-term temporary closure or cessation of the operations may be necessary by requiring regular inspection of all plant areas by assigned operations personnel to continue throughout the duration of the shutdown.

The operation inspects the following at unloading, storage, mixing, grinding and process areas, as applicable to the site:

- Tanks holding cyanide solutions for structural integrity and signs of corrosion and leakage.
- Secondary containments provided for tanks and pipelines for physical integrity, the presence of fluids and available capacity, and to ensure that any drains are closed and, if necessary, locked, to prevent accidental releases to the environment.
- Leak detection and collection systems at leach pads and ponds, as required in the design documents.
- Pipelines, pumps and valves for deterioration and leakage.
- Ponds and impoundments for the parameters identified in their design documents as critical to their containment of cyanide and solutions and maintenance of the water balance, such as available freeboard and integrity of surface water diversions.

The operation inspects cyanide facilities on an established frequency sufficient to assure and document that they are functioning within design parameters.

Operational inspections are carried out on a shift or daily basis at the reagent and cyanide storage area, CIL, CCD, Elution, grinding area, TSF and water ponds, while additional weekly, monthly and quarterly inspections are conducted at the TSF.

Preventative maintenance inspections are conducted on frequencies ranging from daily, weekly, monthly, 6-monthly and annually, in accordance with the manufacturers' requirements for the specific piece of equipment. The records are kept by the Process Maintenance Department.

Records of audits, inspections and subsequent corrective actions identified are documented in accordance with the Integrated Management System (IMS) inspections requirements which includes the nature and date of the corrective actions. Daily and maintenance inspections are recorded on the inspection sheets and any follow-up work requests are logged in the SAP System. Inspection sheets and work orders identify specific items to be observed, the name of the inspector, the date of the inspection and any identified items for corrective actions.

The operation utilizes the SAP System to manage all maintenance tasks including those identified during inspections. Job cards are raised where ad hoc maintenance is required by the plant inspections or observed from plant employees. Planned maintenance schedules are generated in the system which is then automatically issued at the prescribed date and/or frequency as a work order. Maintenance schedules are determined according to the level of risk associated with the equipment and/or manufacturer recommendations and specifications.

Power is supplied to the operation via the Volta River Authority (VRA) grid. In the event of a VRA power failure, the process plant is equipped with 7 GE Diesel Powered gensets with a total emergency/backup power capacity of 27,300-kilowatt (kw). The emergency gensets are inspected and tested daily and weekly as part of the plant preventative maintenance program.

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

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.2**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 4.2; To introduce management and operating systems to minimize cyanide use, thereby limiting concentrations of cyanide in mill tailings.

The operation conducts a program to determine appropriate cyanide addition rates in the mill and evaluate and adjust addition rates as necessary when ore types or processing practices change cyanide requirements.

The programme includes the following test work:

- The Mine to Mill Study is used to plan ore ratios that will be mined in the next 3 years.
- Bottle roll tests and diagnostic tests are conducted to confirm cyanide addition and plant recovery on a weekly basis (composite sample of daily samples).
- An automatic cyanide analyser (OCM 5500 Cyantist) is used to test cyanide levels in first leach tank, adjust the cyanide addition rate according to available free cyanide.
- Manual titration is conducted every two hours in the 13 leach tanks to determine the cyanide concentration in the various tanks.

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

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.3**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 4.3; To implement a comprehensive water management program to protect against unintentional releases.

The operation has developed a comprehensive, probabilistic water balance. A GoldSim water balance model has been developed for the operation. The model is updated annually since 2014 except if significant changes occur within the operation or large imbalances are observed.

The Water Model predicts:

- Water usage, storage in surface pits and ponds;
- Likely water supply and demand volumes for ore processing and dust suppression;
- Changes in volumes / levels and potential overflow in storage facilities (WSF "fresh water dam" and TSF);
- Chemical mass balance using the Contaminant Transport (CT) Module extension for Ahafo Water Management System and Treatment Scenarios.

The water balance includes the following:

- It was observed that the water balance takes into consideration the rate at which tailings is deposited on the TSF;
- The model considers the required freeboard standard on the TSF and Decant Return Water Dam. The model automatically generates a storm event to the maximum of 1:100-year / 24 hr storm event based on historic rainfall data dating back to 2006 (on-site data);
- An on-site weather station provides daily rainfall data used to update the model. Rainfall data dates to 2006;
- Evaporation is measured daily on site;
- Run on of the TSF is included in the catchment area of the dam. No run on exist to the plant and infiltration is negligible as the flow to the pond originates from concrete and HDPE lined surfaces;
- Freezing, thawing conditions are not applicable as there are no snowfalls under normal conditions, which has been verified for the last 12 years;
- The model takes into consideration solution losses from the TSF. The TSF pool is lined with HDPE with the rest of the dam floor consisting of compacted clay layer. Retained interstitial water is calculated in the model;
- The model takes into account the effect of total power failures and was illustrated in the model by simulating the operation of the Event Pond under normal conditions as well as during shutdown conditions;
- The site does not have any treatment, destruction or regeneration systems.
- Retained interstitial water is calculated in the model.

The ponds and impoundments are designed and operated with adequate freeboard above the maximum design storage capacity determined to be necessary from water balance calculations. Newmont's standard requires that the operation maintain a total freeboard of 1 m for TSF's and ponds containing cyanide solutions, however the mine operates the south embankment of the TSF at a freeboard of 3m. The water level of the TSF is checked daily to ensure that the pond is operated at a safe level. The water level of the Process Pond, Event Pond and Raw Water Pond is checked daily to ensure it is operated at a safe level.

The Event Pond has been designed with sufficient capacity for the maximum operating water balance plus runoff from a 100 year 24 - hour storm event. The Event Pond is operated at a minimum level and the standard operating procedure is to pump out the material as quickly as possible in order to have room for any eventuality.

The operation measures precipitation on a daily basis and compares results to design assumptions and revises operating practices as necessary. Rainfall is recorded on-site and included in the monthly sheet used for updating of the water balance. Simulations are run with available data and adjustments are made to operating practices to prevent overtopping or releases to the environment.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 4.4**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 4.4; to implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions.

WAD is sampled in the CIL tails tank, CCD and at the spigot. WAD is measured at the Decant Return Water Pond (on TSF). Sampling is conducted twice a day at the spigot and Decant Return Water Pond. The daily WAD measurements taken at the spigots revealed no exceedances above 50 WAD ppm. Therefore, the water in the Decant Return Water Pond does not exceed 50 WAD ppm.

Only three instances where the WAD cyanide levels exceeded the 50 ppm limit was observed in the past 3 years. The Process Plant investigates in the event that an exceedance occurs. The technical memorandum produced after the investigation details the findings of the investigation, conclusion and recommendations.

No wildlife mortalities were recorded in the past 3 years around the TSF or in the Process Plant, indicating that the current cyanide levels appeared to be effective in preventing significant wildlife mortalities.

There is no heap leach facility at Ahafo Gold Mine.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 4.5**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 4.5; to implement measures to protect fish and wildlife from direct and indirect discharges of cyanide process solutions to surface water.

Ahafo Gold Mine operates four environmental control dams. The environmental control dams collect run-off water from the operational areas and sediment before released to the environment. The water is tested on a monthly basis before released into the natural drainage lines before it joins the rivers in the area. The monitoring data from the environmental control dams for the past 3 years were all below 0.005 mg/l WAD.

Ahafo Gold Mine conducts surface water monitoring at various points at upstream and downstream locations of the site. It can be demonstrated that the release of the water from the environmental control dams do not cause the concentration of free cyanide in the receiving water to exceed 0.022 mg/l.

It is evident from the surface and groundwater monitoring that that indirect discharges to surface water do not cause the in- stream concentration of free cyanide to exceed 0.022 mg/l.

There is no evidence that any indirect discharge to surface water have caused cyanide concentrations in surface water to rise above levels protective of a designated beneficial use for aquatic life.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 4.6**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 4.6; to implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.

The operation implements specific water management or other measures to manage seepage to protect the beneficial use(s) of groundwater beneath and/or immediately down-gradient of the operation. Communities around the operations use groundwater for domestic use.

The TSF has been designed with under drains. The TSF is lined with a clay liner and partially lined with HDPE in the area of the supernatant pool. Secondary under drains have been installed under the HDPE liner. The Process Water and Event Ponds are fully HDPE lined to prevent seepage. Leak detection and recovery systems have been installed at the ponds.

WAD cyanide concentrations in groundwater at compliance points below or downgradient of the facility are below levels that are protective of identified beneficial use of groundwater, namely the use of groundwater for domestic use.

The numerical standard for WAD Cyanide in Effluent Discharge is 0.6 mg/l WAD as detailed in Ghana Standards Authority, Ghana Standard GS 1212:2019 – Environmental Protection Requirements for Effluent Discharge.

Borehole sampling is conducted at 7 boreholes around the TSF on a monthly basis. None of the results for the period since the previous recertification audit to the current audit were equal to or exceeded 0.6 mg/l WAD cyanide.

The operation does not use mill tailings as underground backfill.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 4.7**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 4.7; to provide spill prevention or containment measures for process tanks and pipelines.

Spill prevention or containment measure are provided for all cyanide unloading, storage, mixing and process solution tanks. The sparge and storage tanks are located on concrete ring beams with an impervious HDPE liner beneath the tanks. All other process tanks are located on concrete ring beams with an impervious HDPE liner beneath the tanks, sparge tank, sparge storage tank, CIL, lean eluate tank, treated water tank, pregnant solution tank, CCD feed tank, CCD tails tank, CCD overflow tank and thickener overflow tank. The grinding circuit is located within a concrete bund.

Secondary containments for cyanide unloading, storage, sparge, grinding circuit and process tanks are sized to hold a volume greater than that of the largest tank within the containment and any piping draining back to the tank, and with additional capacity for the design storm event. All cyanide tanks have secondary containment.

All secondary containments are equipped with pumps and pumping systems returning the contents to the process. The sumps are largely automated with fixed piping systems to contained process areas (tanks). No sump pump piping systems are directed to the environment. Emergency power is available on all pumps including the event pond pumps. The Event Pond pumps to CIL tails tank and CDD final tails.

Spill prevention or containment measures are provided for all cyanide process solution pipelines to collect leaks and prevent releases to the environment. A planned maintenance program is in place, supported by inspections each shift.

Cyanide focused risk assessments have not identified that cyanide pipelines present a risk to surface water and consequently they do not require special protective needs.

Cyanide tanks and pipelines are constructed of material compatible with cyanide and high pH solutions. The materials of construction of the plant are specified within the design documentation and appear to be compatible with cyanide and high pH conditions (HDPE, mild or stainless steel).

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 4.8**

not in compliance with

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

The operation is in Full Compliance with Standard of Practice 4.8; to implement quality control/quality assurance procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

Quality control and quality assurance (QCQA) programs have been implemented during construction of all new cyanide facilities and modifications to existing facilities, including cyanide unloading, storage, mixing facilities and other cyanide facilities. The QCQA for the operation's cyanide facilities were addressed in the original ICMC certification audit and the subsequent recertification audits, including the current recertification audit for the construction of the:

- A TSF embankment raise, the 127MT Raise project.
- A new cyanide storage tank and sparge tank.
- Three new leach tanks as part of the Mill Expansion Project.

The QCQA for the operation's cyanide facilities were addressed in the original ICMC certification audit and previous recertification audits. The QAQC documentation observed during the current audit addressed the suitability of materials and adequacy of soil compaction for earth works, the installation of the liner and the construction of the tanks.

QCQA records cyanide facilities have been retained and this was addressed in the original ICMC certification audit and subsequent recertification audits, including the current audit.

The review of cyanide facility construction by appropriately qualified personnel was addressed in the original ICMC certification audit and subsequent recertification audits.

The QCQA documentation for the operation's cyanide facilities is available and were addressed in the original ICMC certification audit and Recertification Audit. QCQA documentation is available for the TSF Embankment Raise, installation of the new cyanide storage and sparge tank and the new CIL tanks, that was undertaken during the audit period.

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

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.9**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 4.9; to implement monitoring programs to evaluate the effects of cyanide use on wildlife, and surface and groundwater quality.

The operation has developed written standard procedures for monitoring activities. These include the:

- Site Wide Water Resources Monitoring plan
- Surface Water Sampling (Grab) procedure.
- Emergency Environmental Monitoring procedure.
- Groundwater Sampling procedure.
- Environmental Control Dams Operations procedure.
- Monitoring of wildlife and wildlife mortalities as detailed in the Cyanide Management Plan.

Sampling and analytical protocols have been developed by appropriately qualified personnel.

The procedures specify how and where the samples should be taken, sample preservation techniques, chain of custody procedures, shipping instructions, cyanide species to be analysed and quality assurance and quality control requirements for cyanide analysis.

Sampling conditions and procedures are documented in writing on the Water Sample Field Sheet.

Monitoring is conducted at frequencies adequate to characterise the medium being monitored and to identify changes in a timely manner. Groundwater and surface water monitoring is conducted on a monthly and quarterly basis. The TSF and other water storage facilities are inspected on a daily and quarterly basis for the presence of any wildlife mortalities.

## PRINCIPLE 5 – DECOMMISSIONING

### Protect Communities and the Environment from Cyanide Through Development and Implementation of Decommissioning Plans for Cyanide Facilities

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

in full compliance with

**The operation is**  in substantial compliance with **Emergency Response Practice 5.1**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 5.1; to plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife, livestock, and the environment.

The operation has developed written procedures to decommission cyanide facilities at the cessation of operations.

The Reclamation and Closure Plan for the Ahafo Gold Mine describes the cyanide decommissioning procedures / steps for the following infrastructure:

- Tailings Storage Facility;
- Cyanide storage tanks;
- Mill, Leach, Elution and Gold Room;
- Process Pond;
- CCD plant; and
- Pipelines, pumps and accessories.

The Reclamation and Closure Plan for the Ahafo Mine states that decommissioning procedures will be initiated once ore processing has ceased at the mill complex. Process solutions will continue to circulate through the plant and CCD circuit until gold recovery has concluded.

A table is included in the plan depicting the *Conceptual Decommissioning Schedule of Mill and Process Plant Components*. The schedule is broken down in the following activities:

- Estimate and implement final cyanide consumption;
- Flush the process circuit with decant water;
- Drain, soaking and rinsing with fresh water;
- Sequential draining of rinse water and sampling
- Contingencies / unplanned activities.

After cyanide related equipment has been decontaminated and cleaned, it will be dismantled, and salvageable contents will be sold off / reused. Non-salvageable and non-saleable inert material will be disposed of and buried in the Raw Water Pond, Process Pond and Event Pond or waste rock dump disposal facility prior to being covered with growth media and re-vegetated.

The cyanide decommissioning procedures are reviewed and updated every three years along with the update of the site wide Reclamation and Closure Plan.

**Standard of Practice 5.2: Establish a financial assurance mechanism capable of fully funding cyanide-related decommissioning activities.**

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 5.2**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 5.2; to establish a financial assurance mechanism capable of fully funding cyanide-related decommissioning activities.

The operation has developed an estimate of the cost to fully fund third party implementation of the cyanide-related decommissioning measures as identified in its site decommissioning or closure plan. The auditors observed the 2021/2022 Ahafo Mine Overall Closure Liabilities Cost.

The closure and liability costs are updated annually.

The operation has established a financial mechanism approved by the applicable jurisdiction to cover the estimated costs for cyanide-related decommissioning activities as identified in its decommissioning and closure strategy. The auditors reviewed four bond statements and an account statement for four cash deposits. The cash deposits and bank guarantees are sufficient to cover the cyanide related decommissioning measures as identified in the site reclamation plan.

## PRINCIPLE 6 – WORKER SAFETY

### Protect Workers' Health and Safety from Exposure to Cyanide

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 6.1**

not in compliance with

#### Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 6.1; to identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.

There are a series of procedures for unloading and sparge mixing operations and the process is partially automated. There is a procedure for equipment decontamination prior to releasing the equipment to maintenance.

The operation runs a permit system which includes entry into confined spaces and requires atmospheric testing. The operation has an IntelliPERMIT system, which is a software-based system implemented in 2012 for permits, with electronic records kept of each permit.

The operational procedures include the following, as applicable:

- Scope
- Licensing and permit requirements
- Training pre-requisites
- References
- Health and Safety (H&S) and Sustainability and External Relations (S&ER) Hazards
- Risk Management Identifier
- Mandatory PPE
- Pre-task Checklist
- Perform Job Procedure.

All procedures include risk assessment references, pre-task checklists, PPE requirements, references to linked procedures, training pre-requisites, and license and permit requirements.

The operation solicits and actively considers worker input in developing and evaluating health and safety procedures. A new procedure or update of a procedure is driven by the author, who sends to procedure to affected stakeholders for review. Once reviewed, the procedure is finally approved by the relevant manager and distributed. Workers at the operation are given the opportunity to provide input to procedures via a variety of mechanisms including pre-shift and regular monthly meetings at which employees are able to raise safety issues. During these meetings, procedures are reviewed and discussed and comments for improvement are directed to supervisors and/or management for consideration.

The site has monthly safety meetings that staff must attend. New procedures and updates on the plant are presented at these meetings. Procedures are distributed to the supervisors to review before they are implemented, and supervisors often sign off the procedures.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 6.2**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 6.2; to operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.

The operation has determined that the optimal pH control for process solutions is 10.5 to prevent the evolution of HCN gas.

Gas surveys were conducted in 2008, 2011, 2016 and again in 2021 to determine areas where workers may be exposed to cyanide in excess of 10 ppm on an instantaneous basis and 4.7 ppm continuously over an 8-hr period.

Where the potential exists for significant cyanide exposure, the operation uses ambient and personal monitoring devices to confirm that controls are adequate to limit worker exposure to hydrogen cyanide gas to 10 ppm on an instantaneous basis and 4.7 ppm continuously over an 8-hour period, as cyanide.

In the event of hydrogen cyanide gas levels triggering the 4.7 ppm and 10 ppm alarm levels, the area will be evacuated. The cause of the event will be investigated by the designated employees wearing the required PPE and personal HCN monitors once the alarm has stopped.

Hydrogen cyanide monitoring equipment is maintained, tested, and calibrated as directed by the manufacturer, and are records retained for at least 3 years. Calibration of the fixed HCN monitors is conducted by the internal Instrumentation Department, with training provided by Drager. Calibration of personal monitors is conducted internally by the Health and Safety Department.

Warning signs, in areas where cyanide is used advising workers that cyanide is present, have been placed at the cyanide sparge and storage tanks, grinding circuit, CIL, CCD, which are the locations where reagent strength cyanide is present, as well as at the TSF and pipelines and WSF, advising workers that cyanide is present, that smoking, open flames and eating and drinking are not allowed, and what personal protective equipment must be worn, as applicable. The signage reinforces messages contained in the induction training and procedures.

Carmosine dye is added to the isotainers by Vehrad Transport and Haulage at the Tema Transfer Facility, and recorded on the Sparge Operation Task sheet, prior to arriving on site.

Showers, eye wash stations and fire extinguishers were present in all areas where cyanide is present. This includes the cyanide sparging and storage tank area, grinding circuit, top of the CIL, CCD, tails tank area. A portable eyewash station is available at the TSF. Emergency eye wash stations and showers are inspected by the Maintenance Department on a monthly basis and the inspection is recorded on a card hanging on the shower. Any defects are recorded as per the SAP maintenance system. The emergency eye wash stations and showers are also inspected prior to conducting work in an area, e.g. prior to sparging isotainers.

Fire extinguishers are inspected monthly by the Emergency Response Team (ERT), and maintenance by the vendor is conducted annually.

Unloading, storage, mixing and process tanks and piping containing cyanide are identified to alert workers of their contents, and the direction of cyanide flow in pipes is designated.

The sodium cyanide Safety Data Sheet (SDS), first aid procedures or other informational materials on cyanide safety in the language of the workforce are available in areas where cyanide is managed. SDS were noted as being available in the cyanide sparging and storage tank area, control room at CIL, CCD and elution area. The operational language for the mine and plant is English in written and verbal communications. This was confirmed through interviews.

Ahafo Gold Mine has implemented the Event Reporting and Investigation Guideline to ensure a consistent approach to classifying, reporting and investigating incidents, determining underlying causes, and communicating lessons learned to prevent recurrences across the organisation. This procedure will also be used in the event of a cyanide exposure. At the time of the audit there had not been any exposure incidents in the previous 3 years.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 6.3**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 6.3; to develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

The site inspection verified emergency showers and water is available throughout the plant. Oxygen and Self-Contained Breathing Apparatus (SCBA) are available at the high security entrance (2), top of CIL (3), plant workshop (2), Gold Room (2). Resuscitator and antidote kits (Cyanokit) are kept by the clinic, and radios are used for communication throughout the operation. The cyanide antidote will be administered by the on-site medical doctor in the event of a cyanide exposure.

The Emergency Response Team (ERT) inspect their first aid equipment daily and during sparging activities. The SCBA and oxygen cylinders at the plant are inspected monthly. There are procedures in place to check the first aid equipment in the clinic (operated by International SOS), the fire truck that has the emergency equipment used by the ERT. The cyanide antidotes were observed to be in date and stored at the clinic in accordance with manufacturer recommendations.

The operation has developed cyanide exposure emergency response procedures to respond to cyanide exposures. In addition, the process induction and cyanide training covers the response requirements for emergency cyanide first aid. These are also listed in signs posted around the plant.

The operation employs a full-time and fully trained ERT and International SOS<sup>1</sup> (ISOS) medical team to effectively respond to cyanide and other incidents at the site. In addition to ERT and ISOS personnel, a number of process plant first responders have been trained in the plant to provide initial rescue efforts. The onsite medical clinic has the capability to treat multiple casualties. This includes a 24/7 staffed clinic with nurses, doctors, a paramedic, pharmacists, radiographer and laboratory technician, ready to respond to any accident/incident at the site.

Given the remote location and capabilities of local hospitals, Newmont and ISOS have determined that personnel would be best treated at the on-site clinic with the trained staff and equipment that they have. For any reason if secondary complications occur after initial treatment, the patient will be transferred to a local hospital for further advanced medical care, either by road or air, depending on the severity of the specific medical case. The patients will receive initial management and stabilisation and if secondary complications occur the patient will be transferred to Komfo Anokye Hospital in Kumasi. Komfo Anokye Hospital has acknowledged it can accept, manage and treat patients.

<sup>1</sup> International SOS is a medical and travel security risk services company providing medical personnel and on-site medical services to the Ahafo Gold Mine Operations at the onsite medical clinic.

## PRINCIPLE 7 – EMERGENCY RESPONSE

### Protect Communities and the Environment through the Development of Emergency Response Strategies and Capabilities

**Standard of Practice 7.1: Prepare detailed emergency response plans for potential cyanide releases.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 7.1**

not in compliance with

#### Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 7.1; to prepare detailed emergency response plans for potential cyanide releases.

Ahafo Gold Mine has developed a site wide emergency response plan and a process plant specific plan. These documents outline the various credible event scenarios for the operation and the responsibilities, actions, and notifications required to ensure an effective and efficient response. In addition to these overarching plans, the following documents assist with emergency response scenarios related to cyanide incidents:

- Operations, Maintenance and Surveillance Manual
- Emergency Preparedness Plan for Tailings and Water Storage Facilities
- Emergency Cyanide Spill Procedure
- Tailings and Water Storage and Facility Emergency Preparedness – Community Communication Plan

The operation has a detailed Process Plant Emergency Management Plan and the Emergency Preparedness Plan for Tailings and Water Storage Facilities which list the various credible event scenarios for the site inclusive of cyanide incidents. The plan is reviewed annually and accounts for the following events:

- Catastrophic releases
- Transportation accidents
- Releases during unloading and mixing
- Releases during fires and explosions
- Pipe, valve and tank rupture
- Overtopping of ponds and impoundments
- Power outages and pump failures
- Uncontrolled seepage
- Failure of tailings impoundment and other cyanide facilities.

For each section, actions and/or supporting procedures are outlined to ensure adequate levels of response. These are further supported by the Newmont Rapid Response System which may be initiated for significant events.

Newmont's sodium cyanide supplier, Samsung, has the responsibility for the delivery of sodium cyanide from the point of origin in Korea to the Newmont off-loading facility at Ahafo Gold Mine. Vehrad (transporter) have developed site specific emergency response plans for transport from the Port of Tema to Ahafo Gold Mine. Consideration has been given to transport routes, the physical and chemical form of the cyanide, methods of transport, condition of the road, and the type of vehicles used.

The emergency plans describe:

a) *Specific response actions (as appropriate for the anticipated emergency situations) such as clearing site personnel and potentially affected communities from the area of exposure?*

- Remote area evacuation, surface evacuation and underground evacuation are covered within the Ahafo Emergency Management Plan.
- Evacuation within the plant is detailed in the Ahafo Process Plant Emergency Plan.
- Potentially affected communities will be evacuated in accordance with the Community communication plan.

b) *Use of cyanide antidotes and first aid measures for cyanide exposure?*

- The use of cyanide antidote kits is described in the Medical Treatment of Cyanide Poisoning procedure.
- Cyanide first aid procedures are detailed in the Cyanide Exposure section of the Ahafo Process Plant Emergency Plan.

c) *Control of releases at their source?*

- Control of releases are detailed in the Ahafo Emergency Management Plan and the Emergency Cyanide Spill Procedure.

d) *Containment, assessment, mitigation and future prevention of releases?*

- Containment, assessment, mitigation and future prevention of releases is covered in the Emergency Cyanide Spill Procedure and Event Reporting and Investigation Guideline.

**Standard of Practice 7.2: Involve site personnel and stakeholders in the planning process.** in full compliance with**The operation is** in substantial compliance with**Standard of Practice 7.2** not in compliance with**Summarise the basis for this Finding/Deficiencies Identified:**

The operation is in FULL COMPLIANCE with Standard of Practice 7.2; to involve site personnel and stakeholders in the planning process.

The emergency response procedures developed for Ahafo Gold Mine have been developed using cross-functional teams from the process, H&S, environmental and community relations departments. This is to ensure that adequate consideration is given to the various impacted departments and ensure that personnel understand and are aware of their roles in an emergency. Documentation of these reviews is included on the document control forms submitted for each document as per the Integrated Management System standards.

The operation involves its workforce in the emergency planning process through monthly safety meetings where procedures and updates, including emergency response, are presented and through mock emergency drills that are conducted periodically to test response procedures for various cyanide exposure scenarios.

External stakeholders do not have a direct involvement in emergency preparedness and response planning; however, the community relations team maintains contact with community figures and utilises community liaison officers to share relevant information with affected peoples with regards to emergency response planning. The department maintains a Community Communication Plan and list of critical external contacts including chiefs, clergy, and other notable community persons to effectively disseminate information about possible emergency situations and responses.

Through the use of community information centres and community liaison officers, Ahafo Gold Mine is able to ensure communication flow with relevant stakeholders prior to and/or in the event of an emergency situation. Refer to 9.1 for details of the community meetings held during which operational issues and cyanide management measures are discussed. The meetings provide stakeholders with the opportunity to communicate issues of concern regarding the management of cyanide.

Due to the location and response capacities of local agencies, Ahafo Gold Mine would maintain responsibility for emergency response activities within the communities. However, emergency preparedness and response plans are made available to and shared with the Inspectorate Division of the Ghana Minerals Commission (MINCOM), Ghana Environmental Protection Agency (EPA) as part of their routine site reviews. Local agencies (e.g. Fire and Police) have a statutory responsibility to assist with notification and mobilization of people under direction from Newmont. In addition, Newmont has standing contracts with transport companies and other community service providers to help with mobilization and evacuation of personnel if required under direction from Ahafo ERT.

The operation engages in communication with stakeholders to keep the emergency response procedures current, where applicable. The workforce is included in the emergency response planning process through the following:

- Induction and refresher training where they are trained on the use of the emergency response process.
- Through the monthly meetings.

- Through the testing of the emergency responses by undertaking the mock emergency drills.

Community stakeholder meetings are held during which operational issues and cyanide management measures are discussed with the attendees. The meetings provide community members with the opportunity to communicate issues of concern regarding the management of cyanide.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 7.3**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 7.3; to designate appropriate personnel and commit necessary equipment and resources for emergency response.

The Ahafo Emergency Management Plan states the responsibilities of the Security Control Centre (SCC) and Security Manager and Health and Safety Manager to mobilise ERT and that the ERT captain to mobilise the necessary resources. The Ahafo Process Plant Emergency Plan stipules the detailed roles and responsibilities for plant emergencies.

There are three ERT crews, which include a captain and four responders (five for each crew) that work on a rotational schedule.

The Ahafo Process Plant Emergency Management Plan refers to the responsibility of trained first responders to attend to the exposed employee until the ERT arrives. There are currently approximately 13 trained first responders on the plant.

The ERT training matrix included various emergency related training modules such as cyanide awareness and first aid, chemical awareness, rope rescue - high angle rescue at heights, medical cardiopulmonary resuscitation (CPR) and automated external defibrillators (AED) and oxygen administration, cyanide sparging response procedure sign off, confined space rescue and hazmat response.

Call out procedures and contact information is included within the Ahafo Emergency Response Plan and Ahafo Process Plant Emergency Plan. Call out list are updated and distributed weekly and was observed by the auditor. All calls go to SCC before the ERT is mobilised, which is specified in induction. The SCC has all contact lists.

Duties and responsibilities are detailed at the beginning of each emergency plan.

The Cyanide Sparging PPE and Equipment Checklist details the equipment available to the ERT during an incident. Emergency response equipment is inspected to ensure availability; the fire truck, rescue truck, hazmat truck and first aid box checklist (fire truck) are checked daily, the Cyanide Sparging PPE and Equipment checklist is checked weekly, and fire hydrants and SCBA is checked monthly.

The internal clinic takes part in emergency response. The only outside responders are the local Fire Department if the incident requires additional firefighting resources. The Ahafo Emergency Response Plan includes contact details for the local fire service and responsibilities for the internal clinic.

The auditors were informed that the local Police and Fire Department are aware of their possible involvement in the event of an emergency, should the magnitude of the emergency require it.

The Ahafo Gold Mine clinic is aware of the potential need to treat patients for cyanide exposure and the operation has assured that the medical facility has adequate, qualified staff and equipment and expertise to

respond to cyanide exposures. This was confirmed during an interview with the Doctor on duty at the clinic. The clinic and the ERT are involved in full chain mock drills.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 7.4**

not in compliance with

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

The operation is in full compliance with Standard of Practice 7.4; to develop procedures for internal and external emergency notification and reporting.

The Ahafo Emergency Response Plan includes the relevant emergency contact numbers required to notify management, regulatory agencies, outside response providers and medical facilities of the cyanide emergency.

The Ahafo Emergency Management Plan includes procedures and contact information for notifying potentially affected communities of the cyanide-related incident and any necessary response measures and for communications with the media. The Community Relations Department maintains a Community Communication Plan and list of critical external contacts including chiefs, clergy, and other notable community persons to effectively disseminate information about possible emergency situations and responses.

The Ahafo Emergency Management Plan was updated to included the requirement for notification to the ICMI of any significant cyanide incidents within 24 hrs of the incident occurrence and in accordance with the requirements of the site's Event Reporting and Investigation Procedure.

Further details on the root cause, health, safety and environmental impacts, and ay mitigation measures must be supplied to the ICMI within 7 days of the incident.

No significant cyanide incidents, as defined in the ICMI's *Definitions and Acronyms* document, have occurred during the current recertification period.

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

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 7.5**

not in compliance with

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

The operation is in full compliance with Standard of Practice 7.5; to incorporate remediation measures and monitoring elements into response plans and account for the additional hazards of using cyanide treatment chemicals.

The plans and procedures describe specific remediation measures as appropriate for the likely cyanide release scenarios.

- Recovery or neutralisation of solutions or solids Ferrous sulphate will be used to neutralise CN spills as per the procedure Neutralize CN Spills with Ferrous Sulphate. The procedure provides a table that should be used to determine the required amount of ferrous sulphate solution required for neutralisation in relation to the spill volume and measured cyanide concentration in the spill. The Emergency Cyanide Spill Response Procedure states that the ferrous sulphate is stored at the reagent shed. Samples are taken of the residual material after clean-up of the area to determine the WAD cyanide level. Neutralisation is continued until the WAD cyanide can no longer be detected as per the procedure Emergency Cyanide Spill Response Procedure.
- Decontamination of soils or other contaminated media - Contaminated tools and other equipment used in incident response are required to be washed in an area where water will enter the process plant circuit, as per the procedure Neutralize CN Spills with Ferrous Sulphate. Contaminated soil must be scraped up and WAD cyanide samples taken. Continue sampling and scraping up contaminated soil until WAD samples indicate that no more WAD cyanide is present on the samples. Contaminated soil must be added back into the semi-autogenous grinding (SAG) mill as per the requirements of the Emergency Cyanide Spill Response Procedure.
- Management and/or disposal of spill clean-up debris - Cleaned up spillage can be reintroduced into the process plant via the SAG Mill or deposited onto the TSF, as per the procedure Neutralize CN Spills with Ferrous Sulphate and Emergency Cyanide Spill Response Procedure.
- Provision of an alternative drinking water supply - Alternative drinking water is supplied if required. This is covered in the Ahafo Emergency Management Plan.

The procedure *Neutralize CN Spills with Ferrous Sulphate* prohibits the use of ferrous sulphate to treat cyanide that has been released into surface water.

The Emergency Environmental Monitoring procedure addresses the potential need for environmental monitoring to identify the extent and effects of a cyanide release, and include sampling methodologies, parameters and, where practical, possible sampling locations. Field sampling requirements are covered in the Emergency Environmental Monitoring, and the sampling points are indicated on the Emergency Environmental Monitoring Locations Map.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 7.6**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 7.6; to periodically evaluate response procedures and capabilities and revise them as needed.

The operation reviews and evaluates the cyanide-related elements of its Emergency Response Plans for adequacy on a regular basis. The Ahafo Emergency Management Plan is reviewed annually, or in the event of a major change, such as the results of a drill or incident. The Emergency Cyanide Spill Response Procedure and process plant procedures are updated every 3 years.

Cyanide related mock drills are conducted twice a year and involves the plant first responders, ERT and clinic personnel. Plant employees will be evacuated from the affected areas. Mock emergency drills are conducted to test response procedures for various cyanide exposure scenarios including human exposure and environmental incidents, and as part of the Emergency Management Plan evaluation process.

The mock drill reports include:

- Scenario;
- Field observations Log from incident site;
- Details of debriefing meeting, including attendees;
- Areas of improvement (action to be taken, by whom, target date and additional comments)

There are provisions in place to evaluate and revise the Emergency Response Plans after any cyanide-related emergency requiring its implementation. There is a de-briefing session after each mock emergency drill. The de-briefing session gives rise to action, which may include the revision of the Emergency Response Plans. The Process Training Coordinator confirmed that training material will be updated, as and when required, following the mock drill debriefing sessions.

Ahafo Emergency Management Plan states that the plan shall be updated and reviewed as a minimum on an annual basis or when there is a significant change, shift, risk or expansion within the operation as outlined in the scope of this plan.

## PRINCIPLE 8 – TRAINING

### Train Workers and Emergency Response Personnel to Manage Cyanide in a Safe and Environmentally Protective Manner

**Standard of Practice 8.1: Train workers to understand the hazards associated with cyanide use.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 8.1**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 8.1; to train workers to understand the hazards associated with cyanide use.

All contractors and employees working in the plant receives process plant induction training including cyanide awareness and cyanide hazard recognition and emergency response as well as a separate module on cyanide awareness training. It is presented to employees when returning from annual leave and contractors annually.

The Ahafo Process Safety & Security Induction presentation includes the following:

- General information on cyanide;
- Response alarm levels;
- Areas where cyanide is found on the plant;
- Characteristics of cyanide gas;
- Early warning signs / symptoms;
- Management of cyanide risks (required PPE);
- Emergency procedure, response and First Aid procedures.

The Cyanide Awareness Training presentation includes the following:

- Cyanide information and background
- Cyanide hazards
- Cyanide management at Ahafo
- Cyanide exposure
- Cyanide first aid and medical treatment
- Safe handling guidelines
- Spill response
- Key cyanide safety tips

The card access control system prevents personnel and contractors from entering the plant if the induction was not completed and signed off by Training, Security and Process Departments.

Training records are kept on SAP on the Learning Solutions (LSO) module. Training records are retained for the duration of employment plus an additional 8 years.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 8.2**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 8.2; to train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.

The operation trains workers to perform their normal production tasks, including unloading, mixing, production and maintenance, with minimum risk to worker health and safety in a manner that prevents unplanned cyanide releases.

The auditors observed the Ahafo Process Training Matrix. The Matrix stipulates training needs as identified per occupation and per section of the plant such as operation section, maintenance section, etc.

The various training modules required are categorised as follows:

- M – mandatory (required before the person can access the plat)
- R – required (training required for the tasks that will be performed)
- E – elected (person was elected to receive additional training where a gap might have been identified).

The matrix is applicable to all employees as well as long-term contractors. The required training is divided into the following sections:

- New Hire (including Process Plant Induction that includes the General Cyanide Awareness module);
- Mandatory Process Safety Training (including Cyanide Awareness);
- Process Operation Sectional (example Reagents, CCD Operations, Tailings Operations which will all include an element of Cyanide since cyanide will be encountered in these areas);
- City & Guilds metalliferous Certificate II and III in process operation, example Respond to an unplanned shut down, conduct elution processes, Thickening and Clarifying (some of the modules will have sections on Cyanide);
- General Health and Safety Loss Prevention Training (Senior First Aid, PPE Training, etc.)
- Managerial (Organisational effectiveness, talent development)
- Software Training / Minerals Comm. Statutory Exams / Computer.

Training modules include both in the class and on the job training.

Training elements specific to the process area are identified within area specific training sessions plans. The training session plans requires a 90% pass rate for the theory component and a 100% pass rate for the in-field competency assessment. The Standard Operating Procedure (SOP) and Standard Task Procedures (STP) for the tasks form part of the module.

Appropriately qualified personnel provide task training related to cyanide management activities.

The training department will conduct a Standard Task Procedure on an employee once the mandatory and required theoretical and practical training has been completed for a specific task. Sampled training records were observed to verify and confirm that employees receive task specific training prior to working with cyanide.

Cyanide Awareness, Chemical Awareness Training, Confined Space Entry Safety training are refreshed annually. Chemical / Hydrocarbon Spill Management and Fire Awareness & Extinguisher training, section specific training is refreshed every 2 years.

Supervisors complete the Planned Task Observations (PTOs) at regular intervals to confirm the trainee is remains competent, results are kept at the Process Plant with the supervisors. PTO are conducted on employees to ensure a continual understanding of a specific task. The PTO observer checks the various steps as stipulated in the Job Procedure attached to the PTO form.

Training records are retained for the duration of employment plus an additional 8 years. The records include the names of the employees and the trainer, the date of training, the topics covered, and if the employee demonstrated an understanding of the training material.

PTO's are retained for at least 3 years. The PTO stipulate the name of the employee assessed, the observer's name, the date of the assessment, the task observed, and the result of the assessment.

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

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 8.3**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 8.3; to train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

All cyanide unloading, mixing, production and maintenance personnel are trained in the procedures to be followed if cyanide is to be released. The Plant First Responders and ERT are trained in the procedures included in the Emergency Response Plan regarding cyanide, including the use of necessary response equipment.

The following cyanide specific First Aid and Emergency training is presented at Ahafo Gold Mine:

- General Plant Induction is presented to all employees, contractors. The induction presentation includes general information on cyanide identification and use as well as basic emergency response and first aid measures.
- Cyanide Awareness training is presented to all employees, long term contractors, Emergency Response Team (ERT) members, International SOS employees, Community Relations employees. The training includes detailed information on the cyanide identification, emergency response and first aid treatment.
- A module on Cyanide First Aid Response has been included in the emergency first responders training presentation presented to all on-plant first responders. The module covers identification of cyanide and cyanide emergency response and first aid.
- The First Aid Trainer presents the first aid aspects to the Plant First Responders;
- The Emergency Response Team Coordinator presents the “Emergency First Response Process Plant” presentation to the Plant First Responders;
- The Process Training Coordinator presents the cyanide aspects to the Plant First Responders and ERT.

This training is further reinforced through undertaking mock emergency drills.

No community members, local responders or off-site medical providers will respond to emergencies related to cyanide. Emergency Response Co-ordinators and members of the ERT are trained in the procedures included in the Emergency Response Plan regarding cyanide, including the use of necessary response equipment. The Process Training Coordinator provides annual cyanide related training to the International SOS Clinic. The Process Training Coordinator provides training to the Community Relations Department on cyanide related matters and response in order for them to be able to discuss cyanide matters during engagement with the local communities.

Cyanide Awareness Training is refreshed annually. Emergency Response and First Aid training for the first responders is refreshed every two years. Mock emergency drills are undertaken at a minimum once a year.

Training records are kept in the LSO system as well as hard copies at the training Department. The training records included the names of the employee, the trainer and the date of training, the topics covered and how

an employee demonstrated an understanding of the training materials. Training records are retained for the duration of employment plus an additional 8 years.

## PRINCIPLE 9 – DIALOGUE

### Engage in Public Consultation and Disclosure

**Standard of Practice 9.1: Promote dialogue with stakeholders regarding cyanide management and responsibly address identified concerns.**

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 9.1**

not in compliance with

#### Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Standard of Practice 9.1; to promote dialogue with stakeholders regarding cyanide management and responsibly address identified concerns.

Five Community Information Centres are situated in the various communities. The information centres are manned by community relations officers and have cyanide fact sheets available. Flyers are available for distribution to the community members. Community members can approach the officers with concerns.

Stakeholder groups in the vicinity of Ahafo Gold Mine consist of community leaders, youth associations, religious leaders, woman groups, local authorities, non-governmental organisations (NGOs).

Stakeholder meetings are held when specific projects are underway at the mine to provide more information on the projects. The meetings are conducted in the local language.

Mine tours are presented to interested parties and school groups to provide more information on the mine and the associated operations.

Quarterly Stakeholder Engagement Meetings are held during which operational issues and cyanide management measures are discussed with the attendees. The meeting provides an open forum to the attendees to ask questions. The meetings are held in the communities with one meeting held with the main communities and one meeting with the fence line communities. There are currently five main communities situated close to operations and ten fence line communities. Due to the Covid-19 pandemic, no meetings were held in 2020 and 2021.

An Annual Stakeholder Engagement Plan is compiled that stipulates the quarterly meetings planned with the stakeholder groups. The Stakeholder Engagement Schedule provides detail on the number of invitees, topics for discussion, engagement frequency, venue and proposed month of engagement. Reclamation / cyanide management updates is listed with all these groups as a topic of discussion. Although some of the meetings were not specifically about cyanide, these meetings provide stakeholders with the opportunity to communicate issues of concern regarding the management of cyanide.

Newmont Ahafo has implemented a Complaint and Grievance System. Stakeholders can lodge complaints or request information at the community centres. They can obtain information about Newmont and the mining process. All complaints are put into an electronic database (Cintellate). The complaint is investigated within 30 days and feedback is provided to the complainant. The Complaints and Grievance Officer confirmed to the auditors that no cyanide related complaints have been received.

**Standard of Practice 9.2: Make appropriate operational and environmental information regarding cyanide available to stakeholders.**

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 9.2**

not in compliance with

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

The operation is in FULL COMPLIANCE with Standard of Practice 9.2; to make appropriate operational and environmental information regarding cyanide available to stakeholders.

Ahafo Gold Mine has developed a written Cyanide Fact Sheet. The fact sheet is distributed at the external stakeholder meetings and available at the community information centres.

The fact sheet covers the following topics:

- What is cyanide;
- Where is cyanide found;
- What is cyanide used for;
- How does Newmont use cyanide;
- How can one get exposed to cyanide;
- Precautions to take when exposed to cyanide.

Ahafo Gold Mine has developed a presentation on cyanide management. The presentation is presented in the local language, Twi, during the stakeholder engagement meetings.

- The presentation covers the following topics:
- Facts about cyanide;
- Newmont's cyanide management system;
- Cyanide management.

The presentation includes various pictures of cyanide management facilities and related infrastructure.

Newmont reports on cyanide management, at all operations, publicly on in the Newmont Sustainability Report available the company website. The information in the Sustainability Report<sup>2</sup> is provided at a high-level per site stating the number of incidents distinguishing between:

- Releases off site requiring response or remediation
- Adverse effects on human health

<sup>2</sup> <https://www.newmont.com/sustainability/sustainability-reporting/default.aspx>

- Adverse effects to the environment
- Requiring reporting under applicable regulations
- Exceedances of applicable limits of the Cyanide Code
- Impacts to biodiversity.

Cyanide exposure or release related incidents, if any, will be reported on in detail internally, to affected communities and to the relevant Regulators.

There have been no incidents of cyanide exposure in the last 3 years. There have been no cyanide releases of the mine site in the past 3 years.

## Signature Page

**Golder Associates Africa (Pty) Ltd.**



Marié Schlechter  
*ICMI Lead and Mine Technical Expert Auditor*

MS/EC/ms

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**APPENDIX A**

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