INTERNATIONAL CYANIDE MANAGEMENT INSTITUTE

Cyanide Code Compliance Audit Gold Mining Operations

Recertification Summary Audit Report

AngloGold Ashanti Geita Gold Mine Tanzania

27th – 31st May 2019

Name of Operation:	Geita Gold Mining Ltd.
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Name of Operation Operator:	AngloGold Ashanti
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Location detail and description of operation

Location Details

The Geita Gold Mining operation is situated in the Lake Victoria Gold fields of North Western Tanzania, only about 85 kilometres from Mwanza City and 20 kilometres south east of the nearest point of Lake Victoria. The company has its head office in Geita, only 5 kilometres west of the Geita town, and also a supporting office in Dar es Salaam, Tanzania.

Process Description

The Geita process plant was designed and constructed by Lycopodium, a process engineering company based in Perth, Western Australia. The plant, which was commissioned in June 2000, had a conventional gold ore processing flow sheet with a design throughput capacity of 4 million tonnes per annum. In December 2002 a secondary crushing plant, two additional leach tanks and the cyclone classification circuit were upgraded, resulting in the throughput capacity of the plant being raised to 6 million tonnes per annum for a predominantly soft blend (and around 5 million tonnes per annum for a harder blend). In 2011, a tertiary crushing plant was constructed to improve mill feed stability.

The process plant includes:

- Primary, secondary and tertiary crushing plants

- Semi-autogenous grinding (SAG) mill and ball mill
- SAG mill scats recycle line - (Scats/pebble crusher was decommissioned)
- G-max Cyclones
- High rate thickener
- Pre-oxidation in the first 2 tanks followed by a ten stage carbon-in-leach (CIL) process
- Gold recovery circuit (Elution, Electrowinning and Smelting)
- Gravity concentration section within the milling and classification circuit, where the gravity gold is recovered using Knelson concentrators and an intensive cyanidation process.

The primary crusher is capable of treating 1000 tons per hour. The material from the primary crusher is further crushed through secondary and tertiary crushers to reduce the material to a size that can be handled by the SAG mill. The crushed material is stockpiled on the fine ore stockpile and control-fed into the SAG mill.

The SAG and the Ball mills grind the material into finer particles (P80 of 106 microns) where gold particles are liberated. The milled product is pumped into a cluster of classifying cyclones to separate the fine products from the coarse products. Coarse product is recycled back to the ball mill for regrinding while a portion of it is fed into the gravity concentrators where free gold is recovered.

The fine product slurry is thickened in a thickener to reduce the amount of process water in the slurry before pumping into a train of CIL (Carbin-in-Leach) tanks. All process water is recovered and recycled through the mills. Carbon is added to adsorb gold in the CIL tanks in a counter current flow. Loaded carbon is recovered from the first CIL tank into an elution column where hot caustic solution is used to strip gold from the loaded carbon. The gold in solution is passed through electrowinning cells for the gold to be deposited on stainless steel cathodes. The gold sludge is then cleaned, mixed with fluxing agents and then smelted into gold bars.

The tailings from the process plant are deposited into a fully contained tailings dam. This dam is located 3 kilometres north of the plant site. The main embankment runs around three sides of the facility. Tailings are deposited from the embankment using conventional spigot type discharges. This generates and maintains a pond of clear water within the dam where a decant tower has been constructed. The decant water is pumped back to the process water pond. The dam walls are constructed from mine waste.

An Asset Management Frame Work Policy has been introduced to ensure that the overall asset life cycle is optimised. Engineering and maintenance therefore has been set-up in such a way that development of maintenance strategies, equipment reliability and condition monitoring is split from the day to day execution of activities. This provides an opportunity to review and refine the strategy on a continuous basis through defect elimination and the optimisation of the schedule.

Using historical maintenance data as well as the performance numbers of each individual piece of equipment, the appropriate maintenance strategy is developed which

includes a complete work package, making ample use of photographs, detailing the following:

1. Hazards associated with the activities
2. Safety procedures and measures that need to be followed or taken to reduce the impact possibility of the associated hazards.
3. The condition limitations for doing the required work.
4. The tolerances that will be acceptable for signing off the completed work.
5. Sequence of the steps that need to be taken with diagrams or photos.
6. Material and equipment required to do the work.
7. Handover requirements.
8. Final over inspection and signoff by supervisor

This ensures that any person with basic knowledge will be able to complete the task safely and ensure that the outcome will be consistent.

Process description

The ore processing plant is a fairly standard reduction plant using Carbon-in-Leach and Knelson concentrator technology. Designed and commissioned by Lycopodium of Australia, the plant's original design capacity was 4 million tonnes per annum, but has since been upgraded to a maximum capacity of 6 million tonnes per annum of soft ore and 5.0 million tonnes per annum of hard ore. The primary crusher and both mills and the feeders were manufactured by Nordberg, with overall engineering, procurement, and construction management (EPCM - engineering, procurement, and construction management) by Lycopodium. The entire plant is a single flow process.

Crushing Circuit:

The majority of the ore from the pit is dumped onto the run-of-mine (ROM) stockpile, and then fed into the gyratory crusher by a front end loader. The plant design is such that all ore passes through this crusher. The crusher feed rate is higher than the plant design rate which is currently targeted at around 640 tonnes per hour, and there is a buffer stockpile with a total capacity of around 100,000 tonnes. Reasonable stock of critical crusher spares is always maintained to ensure minimum delays in the crushing operation.

The ore is crushed in a three stage crushing circuit and the crushed product is deposited on the fine ore stockpile. A conveyor belt transfers the ore form the fine ore stockpile directly into the SAG Mill feed.

Milling Circuit:

The SAG mill is 9.14m in diameter, and 5.5m long. The underflow from the primary cyclones passes into the, 6.71m in diameter and 9.6m in length, Ball Mill. This mill operates in closed circuit with the cyclones. Two 48 inch Knelson Concentrators are used for gravity gold recovery.

The concentrate from the gravity circuit (Knelson concentrators) enters a closed circuit Acacia Reactor from where the solution is pumped to the gold room where it is passed through a dedicated electro winning cell.

The overflow material from the cyclones passes through linear screens, before entering the 25m diameter high rate de-watering thickener. The overflow from the thickener flows

into a settling dam, which has provision to overflow into the emergency pond, in case the settling pond is full.

Carbon In Leach (CIL) Circuit:

The underflow from the thickener first enters a series of two pre oxidation tanks in the CIL circuit, and then it flows into the first leach (CIL) tank where the first stage Sodium Cyanide is added. Second stage addition is done into Tank #6 to maintain a more consistent free cyanide profile in solution at lower terminal values. Cyanide addition is controlled automatically using a TAC 1000 control unit. There are ten 2240m^3 leach tanks in total. All ten CIL tanks have activated carbon which is moved counter currently to the slurry flow. The vessels are all mechanically agitated, and have air agitation as a backup. The air also acts as a backup for the oxygen system. The overflow from the final leach tank passes through a safety screen to recover any escaped carbon, and then into a 40m^3 tailings tank from where it is pumped to the tailings dam. The carbon safety screen overflow passes through a fine carbon vibrating screen to remove grits and recover all fines carbon +0.8mm for further treatment (incinerating – carbon ash).
WAD cyanide to the Tailings Storage Facility (TSF) is controlled firstly via TAC1000 where by free cyanide is measured in CIL tank 10 and tank 12 prior to discharge to the Tailings Hopper and then WAD (Weak Acid Dissociable) cyanide is measured via a WAD 1000s cyanide analyser. The upper level of concentrations of WAD cyanide considered safe for migratory birds and flowing water is the level of 50 ppm. During periods of low dilution water or spikes in WAD cyanide, hydrogen peroxide is added in the tails line as means of cyanide destruction.

Elution and Gold Room:

The loaded carbon is transferred into an acid wash column. Dilute hydrochloric acid solution is added in a batch process before the carbon is transferred into the elution column. Here it is stripped of the gold using a hot dilute caustic solution. Strip water is pumped from the strip solution tank, and heated in a heat exchanger in counter flow with the eluate outflow, as well as by two 2.25MW diesel-fired heaters in series.
The eluate solution passes through the eluate filters and is stored in a stainless steel eluate storage tank. The eluate is then transferred into the gold room where it is pumped through the electro-winning cells. The cathodes are removed from the solution and washed, together with the underflow (sludge) from the electro-winning tanks.
The sludge is de-watered in a filter press, and the filter cake fed into one of four calcine ovens. From the ovens, the gold is then finally smelted in a diesel fired furnace and poured into bullion bars. The induction furnace slag is crushed and fed back into the SAG mill feed. Gold is sent to Rand Refinery in South Africa, usually via Dar-es-Salaam. The barren carbon is regenerated in the diesel fired rotary kiln.

Auditor's Finding

This operation is

X in full compliance

☐ in substantial compliance

☐ not in compliance

with the International Cyanide Management Code.

This operation has not experienced compliance problems during the previous three year audit cycle.

Audit Company: Eagle Environmental

Audit Team Leader: Arend Hoogervorst

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Names and Signatures of Other Auditors:

Name : Dawid M. L Viljoen Signature _____ Date: 7/8/2019

Dates of Audit: 27th – 31st May 2019

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

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

Facility	Signature of Lead Auditor	Date
Geita Gold Mine		7/8/2019

Auditor's Findings

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

Standard of Practice1.1: Purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment.

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
AGR Australia (Pty) Ltd (AGR) supplied cyanide to Geita Gold Mine (GGM) from their production facility in Australia to the port of Dar Es Salaam (INCO terms CFR Dar Es Salaam) until December 2017. AGR was re-certified as a Cyanide Producer and the full compliance published on the ICMI website dated 3 August 2017. The contract required that all parties (inclusive of the contractors and sub-contractors) must be appropriately certified with the International Cyanide Code.
Samsung supplied cyanide to Geita Gold Mine from the cyanide manufacturers in Korea to the Port of Dar es Salaam from 1st January 2018. The contract requires that all parties (inclusive of the contractors and sub-contractors) must be appropriately certified with the International Cyanide Code. Samsung, as a certified consignor, purchases cyanide from two certified producers, Taekwang (ICMI recertified on 19 June 2017) and Tongsuh (recertified on 23 March 2017). However, during the past three year period, Geita has only received Korean cyanide from Taekwang.
Due to Samsung supply problems, two shipments of cyanide were received from Orica (Production facility recertified on 22 February 2017) in terms of the Samsung supply contract.

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

Standard of Practice 2.1: Establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters.

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The AGR contract covered transport of cyanide from point of manufacture (Kwinana, Australia) to the port of Dar es Salaam, Tanzania and included Cyanide Code compliant transport responsibilities from Kwinana to Port of Dar Es Salaam, until December 2017. A further clearing and inland transport services contract with Freight Forwarders Tanzania (FFT) includes clearing and inland transport services from the port of Dar es Salaam to the Mine at Geita and includes the requirement for the Transporter to be certified with the International Cyanide Code. The AGR contract included risk and responsibility for the product, and required an annual transport handling and disaster response risk assessment to be supplied to the Mine. It also details contractor responsibilities for safety, security, loss containment, training of relevant personnel, and emergency response activities.
Samsung, as consignor, is responsible for transport of the cyanide from the cyanide producer to the port of Dar es Salaam as from 1 January 2018. The Samsung Africa ICMI Supply Chain was recertified on 30 January 2018. FFT Tanzania (recertified 31 July 2018) is responsible for transport of cyanide from the port of Dar es Salaam to Geita mine.

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Up to the end of December 2017, all identified transporters in the Supply Chain from AGR Kwinana, Australia, to Geita Mine, Tanzania, were ICMI-certified under the AGR supply chains and, furthermore, FFT is an ICMI-certified transporter. The requirement for appropriate emergency response plans and capabilities and adequate measures for cyanide management form a part of the certification requirements for transporters and consignors.
From 1 January 2018, Samsung took over responsibility for supply and transport of cyanide from the producer (Taekwang) to the Port of Dar es Salaam. The Samsung ICMI Africa Supply Chain was recertified on 30 January 2018. FFT continued to be responsible for the transport of the cyanide from the port of Dar es Salaam to Geita mine. FFT was

recertified as an ICMI transporter on 31 July 2018. Orica supplied cyanide to Geita as part of the Samsung contract. The Orica East Africa Supply Chain from the producer to port of Dar Es Salaam was certified on April 03, 2018, and the Australia Supply Chain certified August 20, 2018.

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

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The cyanide mixing and storage facility was designed according to applicable jurisdictional rules and other sound and accepted engineering practices, as audited in the original ICMI first certification audit and the tanks, pumps and valves have not changed since the original design and drawing specifications. It was confirmed in the recertification audit that there have been no design changes made since the last certification audit.
The storage of both liquid and solid cyanide is located away from people and surface water. Cyanide containers are stored inside a roofed store on a concrete surface with open sides.
Any mixing area tank leakage drains to the cyanide bund. Any leakage in the dry cyanide storage floor area drains to the reagent storage area sump from where it will be pumped to the tailings hopper in cases of rain water or in case of fire which is fought using water. Water or spillage in the spillage sump is tested before deciding where to pump the spillage. It was confirmed during the site inspection that the cyanide unloading, mixing and storage facilitates do not present a risk to surface water. The sea-tainer de-stuffing area is concreted and drains into the cyanide bund to prevent any spillage from escaping into the storm water system.
The make-up tank is equipped with a high and low level switch, closing the water feed valves to the mixing tank to prevent overfilling. The cyanide dosing and storage tanks are equipped with a level indicator, which interlocks with the mixing tank transfer pump at 97% of operating capacity. High level alarms will show in the control room to warn of a risk of overfilling. It was confirmed during the site inspection that level indicators and high-level alarms are in place, alarming in the SCADA system in the control room. Plant Instrumentation is on the Planned Maintenance System (PMS) inspection schedule which

checks physical levels and interlocks. Reagent strength cyanide tanks are placed in the open with the storage tank equipped with a ventilation pipe. The cyanide mixing tank is open at the top where the bag breaker is in place, acting as a ventilation mechanism.
The solid cyanide store and the reagent strength cyanide tanks and make-up area are situated inside the plant security fence with an entrance controlled via two security entry control systems. The solid cyanide store is fenced with locked gates and entry control. The cyanide mixing and storage area is fenced with entry control. Solid cyanide is stored in the same store as the flocculant, Sodium Hydroxide, fine carbon and lime.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 3.2**

 not in compliance with

Basis for this Finding/Deficiencies Identified:
All empty cyanide packaging is disposed of by being buried on the mine rock dump. The procedure spells out the tasks steps and includes appropriate authorisations and permits which are signed off by Processing, Mine Security and Health, Safety and Environmental Departments to ensure the packaging is not used for any other purpose.
The procedure for mixing sodium cyanide includes operation of valves and couplings and sequencing thereof and checking and clean-up of any leaks or spills. It also requires that all the empty Cyanide bags are washed, both internally and externally, by hosing down with water. The procedure also specifies the use of a "buddy" during the mixing process and cross-references to the specific Buddy procedure. Also in the mixing procedure are the requirements to add Camousine dye to the mixing tank to identify more easily, high strength liquid cyanide spillages. The procedure for de-stuffing sodium cyanide containers includes maximum stacking height of 3 boxes and clean-up requirements.

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

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The site has 88 cyanide specific operational procedures in place. Engineering maintenance is done using a work package for each piece of equipment which includes task steps, equipment requirements, resources, pre-work inspections, PPE (Personal Protective Equipment) and safety notes, and photos. Non-routine tasks are done developing a task specific work package. These work packages are viewed as engineering procedures for all maintenance tasks.
The TSF (Tailings Storage Facility) management and operating plans in place include the AngloGold Ashanti (AGA) Regional TSF Operating Manual dated July 2015. Annual reviews and reports are also used for review of TSF operating parameters. These include an annual review by the AngloGold Ashanti Geotechnical Engineer and an annual TSF audit done by an independent Geotechnical Engineer. The latest report from the AngloGold Ashanti Geotechnical Engineer concluded that the Geita TSF, "…shows no signs of instability and the TSF can provide life-of-mine capacity for the current planned ore reserves. Pool control has been effective, currently the pool is particularly small and located around the decant…" An independent third party report by a geotechnical Engineer on the TSF in 2017 stated, "There is clear evidence that the process manager and plant production superintendent are involved with, and pay attention to, the daily management and operation of the GGM TSF. This level of commitment helps to maintain a high standard for tailings disposal and assists to ensure that the TSF remains in compliance. The TSF waste rock embankments show no signs of instability and with some minor additions to the monitoring system this can be assured. The deposition planning shows that the TSF has sufficient capacity for the life of mine…" The 2019 independent audit report by the same geotechnical engineer stated, "…The TSF waste rock embankments show no signs of instability and with some minor additions to the monitoring system this can be assured. The deposition planning shows that the TSF has sufficient capacity for the life of mine and that sufficient NAF waste rock can be made available…"
The TSF Operating Manual indicates total freeboard as the vertical height between the lowest point on the crest of the perimeter embankment of the TSF and the normal operating pond level at 1.5m. The current freeboard is 7m. The design storm provision up to the wall and beach is for 1:100-year storm event to contain the 1:100-year, 72 hour continuous rainfall event. The Processing Department Cyanide Management Plan, under the section covering WAD Cyanide in the TSF, requires that, at the spigot points, slurry is discharged at WAD Cyanide levels below 50 ppm. The emergency pond in the plant has a freeboard currently set at 40% of capacity.
The SAP PMS system is in place and covers all cyanide equipment on the plant and at the TSF. The SAP PMS system was reviewed and sampled electronically. PMS scheduling was sampled and reviewed and work packs containing safety requirements and task checklists were extensively reviewed and sampled for Code requirements.

All tanks, bunds, pond, impoundments, pipelines, valves and pumps in the plant and on the TSF are listed on the SAP Planned Maintenance System (PMS) and are inspected on a regular basis. The PMS system includes daily and weekly inspections covering the cyanide mixing and storage section, as well as cyanide equipment inspections on a weekly, monthly, six monthly and an annual basis. A quarterly TSF surveillance inspection is carried out by the plant staff and the AGA Geotechnical Engineer. The electronic minutes from inspection records were sampled and reviewed for 2017, 2018 and 2019 and no significant issues were noted.

The Engineering and Reliability Department implement an Asset Management Framework which includes an Asset Integrity Management System (AIMS) which further includes the Process Plant Condition Monitoring of structures (The results are recorded in Ore Risk). Civil structures and mechanical structures are included in the AGA SIMS (Structural Integrity Management System) audit which is done every 5 years and completed by DRA (Oct 2015, report issued Jan 2016). The reports were available and reviewed by the AGA Professional Structural Engineer.

Inspections are scheduled including thickness tests and non-destructive testing and vibration monitoring. Condition monitoring uses design thickness for equipment as a base line and then calculates the minimum safe thickness. The frequency of inspections is deemed adequate to assure and document that equipment is functioning within design parameters.

The plant has standard shut down procedures in place covering breakdowns or planned shutdowns. It was confirmed in the probabilistic water balance that buffer freeboard capacity is more than adequate for the 1:1000 year 72 hour storm event. (The 1:1000 year 72 hour storm check was required by the regulator.)

The mine generates its own power and has spare capacity of approximately 18 MWs. However, there are backup-up Gensets for the Plant (covering the three in-plant ponds) and the TSF and they are both on the SAP PMS. Both Gensets are subject to weekly electrical inspections and on a monthly basis, the power contractor, Watsilla, carries out an inspection and runs a test operation. Records were sighted from 2017 to date.

A change management procedure was noted to be in place and requiring sign off by health, safety and environmental officials. Three Management of Change exercises were sighted and reviewed: - dual cyanide addition on top of Tank #6; Power supply to Reagents/Storage Shed; and Extra TSF Pipeline behind Low Security Mess.

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

X in full compliance with

The operation is

□ in substantial compliance **with Standard of Practice 4.2**

□ not in compliance with

□ not subject to

Basis for this Finding/Deficiencies Identified:
A test program was carried out on all resources, including characterisation, grind tests, and reagent consumption. Reports are available and the SGS Test report dated 27 June 2017 was sampled. The results produced indications that dissolution increases with cyanide addition. Cyanide addition varied from 0.35 to 0.5 kg/t, depending on ore source. A diagram showed that 0.35 kg/t is the economical addition rate. Actual rate varies depending on the blend but are within the test predictions.
The reagent cost variance analyses sighted included the target cyanide consumption for each ore type. Ore is blended to manage reagent consumption and cyanide consumption and maintain WAD levels in the tails. Blending meetings are held once a week on Fridays between Metallurgy, Mining, Geology and Production, and if any blending changes occur, it is discussed beforehand with the Process Department. This meeting guides cyanide set points and consumption planning for the week.
The SGS Test report dated 21 May 2019 showed that significant Gold recovery improvement was observed, increasing cyanide consumption from 0.25 to 1 kg/t. for the recovery graph for the different underground ore areas. Indications are that 0.5 kg/t is optimal. The plant implemented lead nitrate addition and pre-oxidation to further optimise cyanide consumption.
Routine bottle roll tests are conducted on different samples from the blocks mined to establish recovery and reagent consumption. It is evident from the results that recovery is variable within the same block. These results are used in the blending meetings to ensure acceptable plant performance in terms of recovery and reagent consumption.
Daily bottle roll tests on tails re -leach are carried out to establish if the parameters used were optimal and what potential additional recovery could be obtained. The current control used includes the online measurement of free cyanide using a TAC 1000 analyser. The measurements are in tank 3 and tank 6. The cyanide set point is set for tank 3 and is controlled, based on the online measurements by the TAC 1000 analyser. Cyanide addition to the second point, tank 6, is based on cyanide measurement by the TAC 1000 against the setpoint for cyanide in tank 6. Cyanide addition is controlled, based on the TAC 1000 free cyanide concentration in CIL1, via variable speed drives on the cyanide feed peristaltic pumps. The feed system to the leach is equipped with a mass flow meter and this unit is used as a ratio control system in addition to the TAC 1000 free cyanide analyser. Back up for the TAC 1000 unit includes 6 monthly planned maintenance by the supplier and trained staff on the process plant. TAC 1000 values are checked against two hourly manual samples and titrations.

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

X in full compliance with

The operation is
- ☐ in substantial compliance with **Standard of Practice 4.3**
- ☐ not in compliance with

Basis for this Finding/Deficiencies Identified:
The OPSIM (**OP**erational **SIM**ulation tool for the assessment, design, and management of water resource system software model) probabilistic water balance (PWB) has been implemented on the mine since the last certification audit. The focus on the TSF by the Authorities has increased since the previous audit resulting in a full analysis and catchment assessment. (The authorities required use of a 1:1000, 320 mm, equivalent to the average annual rainfall in 3 days. The "normal" assumption used is the 1:100, 24 hour stormwater event of 124 mm.). The most significant conclusion is that there is no risk for overtopping of the TSF. A presentation given to the authorities, demonstrating this conclusion was sighted.
The OPSIM model uses planning data and is calibrated using actual inputs from the plant such as tonnages, rainfall, evaporation, TSF data, and water storages. No discharge to surface water occurs and TSF designers, Knight Piesold, assumed zero seepage in the TSF.
Daily TSF inspections are conducted, including recording of pool levels and dam freeboard. Pool levels and freeboard are surveyed monthly. Weekly satellite images are downloaded to establish and confirm pool size but this still has to be ground truthed.
Calibration can be done monthly. The model compares actual data against simulated data. The OPSIM model can also run various scenarios. Based on the interview and data sighted, the OPSIM model is deemed to be probabilistic.
A daily rainfall data base is kept and historical data from 1952 from nearby Geita town is available, along with 20 years of site-based data available from a local weather station.

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The compliance point is the daily grab sample from the spigots at the TSF.
WAD cyanide for June to Dec 2016
One spike at 54 mg/l WAD cyanide due to TAC 1000 control problems identified.
WAD cyanide for 2017
4 exceedances due to ore changes of massive intrusion of sulphides in S&C cut 3 mined material were observed. Corrective action was to revise blending strategies, resulting in reduction of WAD cyanide to less than 50 mg/l. tracked to increasing setpoint.
WAD cyanide for 2018
Exceedance at 56.5 mg/l was observed on 11 June 2018. An investigation revealed the cause as increases due to blend changes. Corrective action included reducing the cyanide setpoint, revision of shift template to include two hourly cyanide concentrations in tank 3

and 6 against setpoint. The cyanide duo stage addition pump operation was reviewed and communicated to all.
An exceedance at 55.5 mg/l dated 7 Sept 2018 was investigated. The reason was a decant return water pump electrical malfunction, leading to insufficient dilution. Corrective action included dosage of Hydrogen Peroxide to the tails, and decant pumps were repaired. The spigot discharge samples were analysed after repairs and WAD Cyanide returned to below 50 mg/l.

WAD CN for 2019

No exceedances were observed.
The Decant water from the TSF is the only cyanide containing solution entering the desilting dam or the emergency pond. As all values in the spigot feed to the TSF are at less than 50 mg/l WAD cyanide, the WAD cyanide values in the plant water ponds cannot exceed 50 mg/l. The decant return WAD cyanide values since recertification all show values less than 50 mg/l WAD cyanide. Control samples at the Emergency pond, desilting pond, and thickener overflow indicate that the WAD cyanide is less than the 0.001 mg/l limits of detection.
No cyanide-related bird mortalities were recorded since the last certification and thus the 50 mg/l parameter is effective in preventing bird mortalities.

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

No surface water is discharged from the process plant and TSF and thus no jurisdictional mixing zone exists. Surface water samples are taken around the mine site. The Mtakuja river is sampled up and down stream and all values from 2016 to date are below limits of detection of 0.001 mg/l WAD cyanide. Boreholes are sampled up and down stream of the Mine and all values are below limits of detection. The sampling indicates that there is no indirect discharge to surface water. As there have been no indirect discharges, there has been no need for remedial action.

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 4.6**

□ not in compliance with

Basis for this Finding/Deficiencies Identified
Boreholes are placed at strategic points below the TSF to monitor the effect of cyanide on groundwater. A map showing the positions of the boreholes was sighted. The TSF is equipped with under drains in the walls draining to a concrete collection pond and pumped back to the dam. The plant equipment is placed on a concrete surface with spillages contained in bunds. An emergency spillage pond is located to collect spillages from the drainage systems of the plant. Boreholes are located up and down stream of the plant. The WAD cyanide data from 2016 to date for all downstream boreholes are lower than levels of detection of 0.001 mg/l. No backfill is used and there have been no seepages that have increased cyanide concentrations.

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The CIL, pre-oxidation, elution and residue tanks are situated inside a concrete bund area. The bund area is connected to a concrete-lined trench flowing into the emergency pond. The emergency pond is a lined pond, equipped with a pumping system returning the contents to the plant. The cyanide mixing and storage area tanks will drain into a cyanide spillage bund. The acacia leach plant ILR (Intensive Leach Reactor) is situated inside a primary bund, which is again inside a secondary bund, drain holes in the secondary bund lead to the trench feeding the emergency pond. The Leach and CIP tank bases are placed on ring beams equipped with leak detection holes in the ring beams. There is a procedure in place for tank base leak detection. A review of leak detection reports for 2017, 2018 and 2019 shows no moisture was detected in the leak detection points. The reagent strength cyanide tanks are confirmed to be placed on solid concrete foundations. All secondary containments for cyanide unloading, storage, mixing 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. Any overflow from the bund areas is trenched to the emergency pond.
The plant is designed with all tanks draining into bund areas equipped with sumps and sump pumps. These sump pumps return spillage back to the process. Level indication, indicating on the SCADA system in the control room, is installed on all solution ponds.
The TSF HDPE line is placed inside earth trenches and equipped with emergency spillage containment paddocks and the pipeline is inspected daily with the inspections being recorded. The TSF pipeline is part of the SAP PMS and thickness tests are carried out 6 monthly. The pipelines on the plant all run across concrete surfaces draining to

bund areas which are equipped with sumps and pumps. The reagent strength lines also run across concrete surfaces. This was reconfirmed during the site inspection.
Identified as a risk to surface water, the TSF pipe system, including the return and tailings slurry lines, crossing the stream below the Nyamonge dam, are placed inside a concrete launder with paddocks on each end to contain any spillages.
Pipes are mostly constructed of HDPE and tanks are constructed of carbon steel. Valves are stainless steel ball valves. The design criteria are based upon the AGA Continental Cyanide Guidelines. High strength cyanide solution lines are made of stainless steel. This was reconfirmed during the site inspection.

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
No Quality Assurance/Quality Control documentation is available as the plant is 20 years old. The Engineering and Reliability Department implement an Asset Management Framework which includes the Asset Integrity Management System (AIMS) which also covers the Process Plant Condition Monitoring of structures. The AIMS system covers all cyanide equipment containing more than 0.5 mg/l WAD cyanide.
Civil structures and mechanical structures are included in the SIMMS (Structural Integrity Management Monitoring System) Audit which is done every 5 years. The SIMMS audit findings/shortcomings are managed under the Asset Integrity Programme on Site under the direction of the Engineering Manager – Engineering and Reliability. Inspections are scheduled including thickness tests as well as non-destructive testing and vibration monitoring. Conditions monitoring uses design thickness for equipment as a base line and then calculates the minimum safe thickness. Examples of current AIMS and SIMMS documentation were reviewed.
The identified problem areas and recommendations state that the work be scheduled and completed over the next 3 years, as a part of planned maintenance programs, with a follow up inspection to confirm completion. The main issues were corroded beams, and no other significant faults were identified that may impact on the plant cyanide equipment integrity.
AS the TSF is a "work in progress", for this section of the audit, the TSF annual audit reports (internal and external) were reviewed (see 4.1 above) and the TSF was confirmed to be operated within parameters consistent with the Code's Principles and Standards of Practice.

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

X in full compliance with

The operation is

- □ in substantial compliance with **Standard of Practice 4.9**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
An environmental sampling program (including both surface and groundwater sampling) is in place, as is a water quality monitoring manual (including sample preservation, cyanide species sampled, and chain of custody procedures and the sample sheet which includes a Code compliant record of sampling conditions) of surface water and borehole water. This was developed by a graduate Environmental Engineer and reviewed by appropriately qualified consultants. Borehole samples are taken upstream and downstream of the TSF wall and the Nyamonge and Mtakuja streams are sampled up and down stream of the TSF. The sampling maps for surface and groundwater locations were sighted. Wildlife is monitored daily, groundwater and surface water is done monthly. No cyanide-related bird or wildlife mortalities were recorded since the last certification. Sample frequencies are deemed adequate by auditors to characterise the medium monitored.

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

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

X in full compliance with

The operation is

- □ in substantial compliance with **Standard of Practice 5.1**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Geita Mine Closure Plan dated 2016 includes Appendix C : Process Plant Decommissioning Plan, 2016. The Appendix is a detailed procedure for plant closure and demolition, including decontamination activities of the process plant cyanide facilities and the TSF.

The Plan under, 3.2 Cyanide Facility Closure Planning, includes, 3.2.1 Detailed Task Development and Scheduling. The Closure Plan is currently under review as per AGA closure requirements and Government requirements.

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

X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:
In the Geita Gold Mine Closure Plan are two line items: - line 13.2.1 – Remove cyanide processing contaminated fill and dispose of at TSF, and 13.2.2 refers to decontamination of cyanide-contaminated vessels and pipes, with a total provision of USD 56,500. The financial provisions are based upon third party implementation assumptions. The closure estimates are updated quarterly.
The operation has established a self-insurance system as a financial assurance mechanism, and thus a group-based Statement of Financial Strength is being used. A Statement of Financial Strength (Report of factual findings - agreed upon procedures on financial information of AngloGold Ashanti) prepared by the AngloGold Ashanti Group Internal Audit Department (signed by Daneshri Naidu, Chartered Accountant and Senior Internal Audit Manager and by Thienus Coetzee, Senior Vice President: Group Internal Audit), dated 23 May 2019 was sighted. The statement is based upon the AGA Group IFRS annual financial statements for the financial years 2014 to 2018, using the specific criteria required by the ICMI. Daneshri Naidu was verified as a Chartered Accountant registered with the South African Institute of Chartered Accountants since 2006.

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

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

X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:
Cyanide procedures covering process and engineering were reviewed and 88 cyanide SOP's are in place. All procedures include the required PPE and appropriate pre-work

inspections. Procedures further reviewed and confirmed included:- procedure for destuffing (of containers), procedure for working on cyanide pumps and pipelines, cyanide mixing procedure, buddy procedure, burying empty cyanide boxes, procedure for abnormal conditions within the process plant area, procedure for changing a cyanide pump, painting within the Cyanide area, Cyanide dosing amendments, Cyanide PPE Protection Levels, Cyanide PPE Control, Care and Examination, and confined space and hot work entry procedures.

The TSF (Tailings Storage Facility) management and operating plans in place include the AngloGold Ashanti (AGA) Regional TSF Operating Manual dated July 2015. Annual reviews and reports are also used for review of TSF operating parameters. These include an annual review by the AngloGold Ashanti Geotechnical Engineer and an annual TSF audit done by an independent Geotechnical Engineer. The latest report from the AngloGold Ashanti Geotechnical Engineer concluded that the Geita TSF, "…shows no signs of instability and the TSF can provide life-of-mine capacity for the current planned ore reserves. Pool control has been effective, currently the pool is particularly small and located around the decant…" An independent third party report by a geotechnical Engineer on the TSF in 2017 stated, "There is clear evidence that the process manager and plant production superintendent are involved with, and pay attention to, the daily management and operation of the GGM TSF. This level of commitment helps to maintain a high standard for tailings disposal and assists to ensure that the TSF remains in compliance. The TSF waste rock embankments show no signs of instability and with some minor additions to the monitoring system this can be assured. The deposition planning shows that the TSF has sufficient capacity for the life of mine…" The 2019 independent audit report by the same geotechnical engineer stated, "…The TSF waste rock embankments show no signs of instability and with some minor additions to the monitoring system this can be assured. The deposition planning shows that the TSF has sufficient capacity for the life of mine and that sufficient NAF (non acid forming) waste rock can be made available…"

The TSF Operating Manual indicates total freeboard as the vertical height between the lowest point on the crest of the perimeter embankment of the TSF and the normal operating pond level at 1.5m. The current freeboard is 7m. The design storm provision up to the wall is a 1:100 year storm event and the beach is to contain the 72 hour continuous rainfall event. The Processing Department Cyanide Management Plan, under the section covering WAD Cyanide in the TSF, requires that, at the spigot points, slurry is discharged at WAD Cyanide levels below 50 ppm. The emergency pond in the plant has a freeboard currently set at 40% of capacity.

The SAP PMS system is in place and covers all cyanide equipment on the plant and at the TSF. The SAP PMS system was reviewed and sampled electronically. PMS scheduling was sampled and reviewed and work packs containing safety requirements and task checklists were extensively reviewed and sampled for Code requirements.

All tanks, bunds, pond, impoundments, pipelines, valves and pumps in the plant and on the TSF are listed on the SAP Planned Maintenance System (PMS) and are inspected on a regular basis. The PMS system includes daily and weekly inspections covering the cyanide mixing and storage section, as well as cyanide equipment inspections on a weekly, monthly, six monthly and an annual basis. A quarterly TSF surveillance

inspection is carried out by the plant staff and the AGA Geotechnical Engineer. The electronic minutes from inspection records were sampled and reviewed for 2017, 2018 and 2019 and no significant issues were noted.
The Engineering and Reliability Department implement an Asset Management Framework which includes an Asset Integrity Management System (AIMS) which further includes the Process Plant Condition Monitoring of structures (The results are recorded in Ore Risk). Civil structures and mechanical structures are included in the AGA SIMS (Structural Integrity Management System) audit which is done every 5 years and completed by contractors, DRA, (Oct 2015, report issued Jan 2016) The reports were available and reviewed by the AGA Professional Structural Engineer.
Inspections are scheduled including thickness tests and non-destructive testing and vibration monitoring. Condition monitoring uses design thickness for equipment as a base line and then calculates the minimum safe thickness. The frequency of inspections is deemed adequate to assure and document that equipment is functioning within design parameters.
A change management procedure was noted to be in place and requiring sign off by health, safety and environmental officials. Three Management of Change exercises were sighted and reviewed: - dual cyanide addition on top of Tank #6; Power supply to Reagents/Storage Shed; and Extra TSF Pipeline behind Low Security Mess.
SHE (Safety, Health and Environmental) procedures are authorised via the standards committee and senior supervisors, union representatives and the HSE&T Manager attend the committee meetings. Daily toolbox meetings are held with all staff on the plant. It was confirmed during the interviews that all safety and work issues are discussed and that supervisors respond to items raised in meetings. A Mini Risk Assessment Take 5 book including "stop and think through the task and identify the hazards" is used before every task. This is used to raise concerns to supervisors. The Hazard Report file (2017-2019) was reviewed which included safety issues, and cyanide issues.

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The pH set points are determined by the ore types and mix that is fed to the plant. Set points (currently 10.5) are changed by the operator on instructions from the Process Manager or Superintendent. Test work is conducted to determine ore pH requirements. Test work to determine pH is ongoing. The final pH is controlled via a pH meter linked to the lime dust feeder ratio setting. Primary control is a ratio control system to control dry lime feed to the mill feed. On-line pH measurement is done in leach tanks using a pH

meter as well as the TAC 1000 displaying on the SCADA. Interlocks with the cyanide dosing pumps are in place as per AGA cyanide guidelines. Manual pH control at the Acacia ILR reactor is at 13.

There are 14 personal hydrogen cyanide gas monitors (7 PAC 7000, 6 Xam 5000, 1 Xam 7000) currently in use. There are also 8 fixed Polytron hydrogen cyanide gas monitors in place which are linked to the SCADA system where only alarm conditions are shown. The fixed monitors are located in the reagents mixing area (1), the tailings hopper (1), the Leach and CIL area (3), the Milling floor (1), the Acacia ILR reactor (1), and the Gold Room (1). Daily and monthly hot spot surveys are conducted and the highest reading recorded between 2017 and 2019 was 4.6 ppm at tank 7. Fixed Polytron graphs (potential hotspot areas identified) from June to January 2018 and Jan to May 2019 were reviewed. All values were below 4.7 ppm HCN, except CIL Tank 6 where a few instantaneous values were noted, all below 10 ppm HCN. The graphs indicated that there are no HCN values that could exceed 10 parts per million on an instantaneous basis and 4.7 parts per million continuously over an 8-hour period. Fixed gas monitors are installed at the identified hotspots above. All cyanide monitoring equipment is managed by the Safety Department and calibrations and maintenance are carried out six monthly by Dräger, the manufacturer. (Cyanide Gas Detection Procedure number 08270.) According to discussions and interviews, 7.5 ppm is the first warning, activating a flashing yellow light. An alarm of 10 ppm instantaneous triggers evacuation from the area through an audible alarm.

The use of safety showers at strategic locations was confirmed during the site inspection. Sample safety showers were tested and checked for adequate pressure as verified in inspection records. Shower inspections are scheduled on the SAP PMS system and this was verified electronically. Fire extinguishers inspections are carried out by the Fire Department monthly and recorded on a list. Extinguisher records are in the form of a punched hole on the extinguisher tag which was confirmed during site inspections. External contractors carry out pressure testing of the fire extinguishers every 5 years. Pressure testing was noted to be underway during the audit.

MSDSs in English (site working language) are available at the process control room, warehouse, gold room and reagent handling office. The Swahili translation of the Orica Sodium Cyanide, 16-point, MSDS was also available. Chapter 39 of the AGA Cyanide Guidelines (The Chemical Emergency Response Team section) is available in all the cyanide first aid boxes and the emergency room. Appropriate cyanide warning signs were noted throughout the plant during the site inspection. It was verified during the site inspection that cyanide and TSF pipelines are labelled with flow direction indicated on reagent strength pipelines and the storage, mixing and process tanks are marked “cyanide solution”.

All incidents are investigated as per the accident and incident investigation and reporting procedure. No human cyanide exposure incidents have been recorded since the last certification audit.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 6.3**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Radios are used for primary emergency communication and mandown alarms are placed strategically in the plant. Cell phones are also used by management for communication of emergencies. In the Process Plant, medical oxygen, SCBA kits, antidote kits and water is available at the cyanide first aid stations. The Mine Emergency Response team (MERT) use Radios and cell phones for communication. The ambulance is equipped with medical oxygen, cyanide antidote, and resuscitators.
Emergency cabins are inspected by the process plant safety staff weekly and 2017 and 2019 records were sampled. The MERT emergency equipment is also inspected weekly. The ambulance checklist including PPE, respirators, and oxygen cylinders was sighted and ERT emergency equipment checklists were sampled and reviewed. It was confirmed that the cyanide antidote in the clinic is current (November 2019 and Cyanokit expires February 2020) and stored in fridges, with the temperature being checked twice daily. The antidotes are replaced centrally by AGA according to a replacement schedule and manufacturers recommendations.
There is a site-wide mine-wide Crisis and Emergency Management Plan and an Emergency Response Plan for cyanide emergencies in place. The cyanide emergency response includes the reporting of the cyanide incident to the control room using a mandown alarm, phone or cell phone. The control room will inform the MERT using radio Channel 4 and then inform a supervisor by radio to check and report. First responders, who are trained in cyanide emergencies will be despatched and will use the contents of the cyanide emergency cabinets. The Mine-wide Emergency Response Team-MERT, (including a paramedic) is on standby 24 hours and responds to the plant control room. An on-site medical facility will receive the patient from the MERT for cyanide first aid and medical treatment. The facility is capable of keeping patients overnight and has isolation and decontamination facilities. Staff not trained in cyanide emergencies will go to the evacuation assembly points. Emergency responders and first responders are trained both in cyanide releases as well as cyanide first aid.
An on-site GGM (Geita Gold Mine) Clinic (medical facility) will receive the patient from the MERT for cyanide first aid and medical treatment, using the formal clinic protocol, Management of Cyanide Poisoning. The on-site clinic can treat 3 patients for cyanide emergencies. The clinic is also equipped to treat serious injuries before transport to the Designated Geita Referral Regional Hospital (DGRRH), if necessary.
The Geita Mine has a medical service agreement with Geita Hospital (the Designated Geita Referral Regional Hospital (DGRRH)) to accept patients, including cyanide patients. Arrangements will be made so that any specialist required can be requested from Bugando Medical Center or Hospital in Dar Es Salaam so that the patient can receive the services within Geita. In an interview with the Chief Medical Officer at the Mine, he indicated that cyanide patients would be preferably treated at the Geita Gold Mine

Hospital (clinic) or at the Designated Geita Referral Regional Hospital. The appropriate Geita Hospital staff (DGRRH) were trained at Geita Gold Mine in cyanide by Mine Trainers. It was unlikely that patients would be sent to Dar Es Salaam or Nairobi. However, this would be managed on a case-by-case basis.
Cyanide emergency drills for cyanide spillage and mandowns are held every 6 months and include the Plant first responders, the MERT, the ambulance, and the clinic.
Four drill reports were reviewed: - 1) Full cycle drill to clinic. This was an HCN gas inhalation on the top floor next to the tailings hopper. The corrective action plan form was sighted which indicated ineffective communication from the first responder to control room which resulted in personnel retraining; the distance from the scene to the nearest ER cabinet for first responders cyanide PPE was too far, and a new cabinet is being allocated; Security was in the red zone without and this resulted in PPE retraining; there were decontamination issues with first responders and the MERT had to complete the decontamination and this resulted in refresher training for various aspects. 2) A generic chemical spill drill for the laboratories. Recommendations included that GGM install different alarms according to the nature of the incident; a roll call register to be provided in case of emergencies; MERT to conduct joint training with security on how to manage a scene; first aiders to be reminded to put on PPE; and the MERT to improve response time and get more training on casualty handling. 3) Cyanide full cycle gassing man down drill on top of CIL floor. Areas for improvement included incident communication and escalation to the process management team, problems with man down button signal messages in the control room to be investigated; the quality of emergency reporting detail and accuracy to be addressed; indications of employees unconcerned about alarms and drills and failure to respond triggered by incompetence or complacency to be investigated and corrected. 4) A Test evacuation and stretcher usage from the top of the leach, focussing on MERT readiness to respond to rescuing employees from top of Cyclone floor. The training officer was present at all drills. No Community members are directly involved in the emergency response plan. Training records are kept for 30 years after the employee leaves employment.

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

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

X in full compliance with

The operation is

- □ in substantial compliance with **Standard of Practice 7.1**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
There is a site-wide mine wide Crisis and Emergency Management Plan and an Emergency Response Plan for cyanide emergencies in place. The plant specific cyanide plan will default to the mine wide emergency plan on mine wide issues such as mine evacuation and media communication and any community related issues. The Plan includes specific procedural responses to a range of site-specific cyanide failure scenarios. The Plan also describes specific response actions, as appropriate for the anticipated emergency situations, such as clearing site personnel and potentially affected communities from the area of exposure, use of cyanide antidotes and first aid measures for cyanide exposure, control of releases at their source, and containment, assessment, mitigation and future prevention of releases.

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 7.2**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
For the workforce, annual induction refresher training includes emergency response. The MERT is briefed on any Plan revisions. The plant provides the opportunity for input and information to the community on the Plan through dialogue discussions with the community. No local or external agencies are involved in the Plan and the Geita hospital, on-site clinic and emergency response team are involved through mock drills and other communications. Outside responders' or communities do not have roles in the Emergency Response Plan (ERP).

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 7.3**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
The ERP identifies (in section 3 Management roles and responsibilities) the on scene commander (Process Manager, alternate Plant Engineer). By virtue of their operational functions, they have the authority to commit resources, as necessary. The outside responders' or communities do not play roles in the ERP. The Plan identifies emergency

response teams and first responders who are trained to respond to plant emergencies. There is a procedure for daily inspection of cyanide storage, dosing and first aid facilities, emergency cabins which are inspected by the Process plant safety staff. Weekly inspection records were sampled and reviewed. The on-site ambulance contains emergency equipment including cyanide equipment and is inspected daily by the Paramedic. Inspection records were sampled and reviewed. The MERT emergency response equipment includes cyanide emergency equipment and the equipment in their fire tender is inspected daily. The Breathing Apparatus (BA) register and record sheets and the Clinic checklists were sampled and reviewed.
No outside responders, other than Geita hospital and the police (for evacuation purposes), are used during emergency situations. The Plan includes contact references (telephone, cell phone, etc) of internal and external resources for the various scenarios, particularly with detail where external resources and skills might be needed. Periodic drills involving internal and external stakeholders ensure that roles and responsibilities are understood and clearly implemented. Communities do not take part in the emergency responses, but are given information on cyanide.

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

X in full compliance with

The operation is

- □ in substantial compliance with **Standard of Practice 7.4**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
The site-wide mine wide Crisis and Emergency Management Plan and the Cyanide Emergency Response Plan include details for appropriate emergency notification and reporting (internal and external) and the call-out procedure and contact information lists which are updated regularly. Internal and external communication (including the Media) is dealt with in the Plan. All communities are identified by the Community Relations Department. Currently no communities will be affected or required to be contacted or notified.

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

X in full compliance with

The operation is

- □ in substantial compliance with **Standard of Practice 7.5**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
The site-wide mine wide Crisis and Emergency Management Plan and the Cyanide Emergency Response Plan cover clean-up, remediation and a neutralisation methodology linked to operational and environmental procedures. The use of neutralization processes and materials is clearly covered, as is disposal of contaminated materials. There is no scenario whereby drinking water would need to be supplied. Treatment chemicals use is prohibited in cyanide procedures. Emergency sampling is covered in procedures. The Stores Department order and receive chemicals accompanied with MSDSs, which govern the storage compatibility requirements.

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 7.6**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
The ERP is a controlled document which is required to be reviewed annually or after an actual cyanide emergency, or a mock drill which identified deficiencies in the plan, under the section entitled, Plan Maintenance. Drills incorporate identification of problems, action and follow up on completion.

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

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 8.1**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
All Geita visitors, employees and contractors who will be on site for <u>less than</u> 14 days receive basic cyanide awareness training and HSE induction. All process employees, TSF staff and contractors, ERT, Clinic, security, engineering, SGS lab staff, who will be on the plant for <u>more than</u> 14 days receive the detailed Cyanide First Aid presentation and undertake a written test. The two sets of training material were reviewed and found to

meet Cyanide Code requirements. A cyanide first aid training matrix covering all employees and contractors that may come into contact with cyanide is in place and the matrix is made available to Supervisors who, in conjunction with the Training Officer, arrange for the refresher training.
Refresher training is conducted six monthly. Refresher training was checked during interviews and included a sampled review of the interviewee training records. Records are retained for 30 years after the employee leaves employment.

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Geita Process Plant SOP (Standard Operating Procedure) Training Matrix is an electronic record of training of operational training. The modules cover the full spectrum of tasks for the plant. All plant employees receive 1 day cyanide 1st aid training. SOP task training is the responsibility of the Supervisors who present theoretical training to the Employees and an attendance register is kept of the task training. All attendance registers are sent to the Process Trainer for filing. Assessment of this training is carried out by PTO's (Planned Task Observations) done by Supervisors who keep records of all the PTO's undertaken. The training is based on the SOP's for each job. The training matrix specifies which SOP's are required for which jobs. The matrix contains a cyanide matrix, a process operational training matrix and hazard identification training matrix. It was verified that training material contained the required elements. The training superintendent has 15 years of plant experience, a diploma in education, a certificate of competence in occupationally directed education training and development practices and is a St Johns Ambulance First Aid instructor. The two other trainers have “train the trainer” training, and various cyanide and safety training skills.
The training system captures training and ensures that all new staff receive training before being allowed to work on the cyanide equipment. It is reported that a routing form, which covers training requirements before the employee is allowed inside the process plant, is used. The form is also used for contractors.
Task observations are conducted by the Supervisors and are used to identify any additional or refresher training that may be required by a person. The Planned Task Observations (PTOs) monthly requirements are set out for Supervisors (4 per month) and Managers and Superintendents (2 per month). PTOs are scheduled in the SAP PMS. Hard copy records are reportedly available from the commencement of the operation in 2000. Sampled interviewee records and confirmed records.

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
All staff are trained in cyanide first aid which includes cyanide emergency, cyanide first aid, emergency response, and spill response and are therefore able to act as first responders. The Mine Emergency Response Team (MERT) reacts to the emergency following notification by the control room and will be despatched to the plant. The MERT is trained according to a training needs analysis dated 2019. It covers the employee's skill sets and the training needs they still need to undertake. Cyanide first aid training is included under the heading of HAZMAT training. The MERT training calendar for 2019 was sighted which includes search and rescue, vehicle extraction, first aid, road rescue, HAZMAT, confined space and firefighting, and high angle training.
The site ambulance is accompanied by a Paramedic, trained in cyanide first aid and medical treatment. The Geita Mine clinic has a medical service agreement with Geita Hospital (the Designated Geita Referral Regional Hospital - DGRRH)) to accept patients, including cyanide patients. The appropriate Geita Hospital staff were trained at Geita Gold Mine in cyanide first aid by Mine Trainers. - The training attendance list for 12 Geita Hospital Staff members, including pass marks, was sighted. No community members or local responders are involved in the cyanide emergency response, but were involved in dialogue and presentations.
Cyanide emergency drills for cyanide spillage and mandowns are held every 6 months and include the Plant first responders, the MERT, the ambulance, and the clinic.
Four drill reports were reviewed: - 1) Full cycle drill to clinic. This was an HCN gas inhalation on the top floor next to the tailings hopper. The corrective action plan form was sighted which indicated ineffective communication from the first responder to control room which resulted in personnel retraining; the distance from the scene to the nearest ER cabinet for first responders cyanide PPE, was too far and a new cabinet is being allocated; Security was in the red zone without and this resulted in PPE retraining; there were decontamination issues with first responders and the MERT had to complete the decontamination and this resulted in refresher training for various aspects. 2) A generic chemical spill drill for the laboratories. Recommendations included that GGM install different alarms according to the nature of the incident; a roll call register to be provided in case of emergencies; MERT to conduct joint training with security on how to manage a scene; first aiders to be reminded to put on PPE; and the MERT to improve response time and get more training on casualty handling. 3) Cyanide full cycle gassing man down drill on top of the CIL floor. Areas for improvement included incident communication and escalation to the process management team, problems with man

down button signal messages in control room to be investigated; the quality of emergency reporting detail and accuracy to be addressed; indications of employees unconcerned about alarms and drills and failure to respond triggered by incompetence or complacency to be investigated and corrected. 4) A Test evacuation and stretcher usage from the top of the leach, focussing on MERT readiness to respond to rescuing employees from top of Cyclone floor. The training officer was present at all drills. No Community members are directly involved in the emergency response plan. Training records are kept for 30 years after the employee leaves employment.

9. DIALOGUE: Engage in public consultation and disclosure.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 9.1**

 not in compliance with

Basis for this Finding/Deficiencies Identified:
Dialogue meetings are two-way dialogue sessions involving both dissemination of information and the answering of questions on cyanide.
Community Department Officers visit the surrounding villages to communicate on mine affairs monthly. All villages and communities are identified and include:- Saragulwa, Nyamwilolelwa, Nungwe, Lwenge, Kifufu, Isamilo, Kasota, Nyansalwa, Nyawilimilwa, Nungwe, Bugalama, Ntinachi, and Nyawilimilwa. The mine also communicates with the wards of Nyankumbu, Kalangalala, Mtakuja, Mgusu, and Nyamwilolelwa which are wards in Geita town.
Main communication is with community representatives, but if required or requested, an open meeting with the communities can be arranged in conjunction with the community representatives. A time table was sighted for awareness on hazardous environments programs in the Mine given to primary schools within Geita town council, covering 18 schools in 4 wards of Geita town council. These were scheduled from 27 March to 13 May 2019 and 740 Children were addressed.
Specific familiarisation cyanide tours were conducted for two villages below the TSF. The familiarisation tours helped to give the villagers more confidence in the stability and safety of the TSF. Specific meetings are also held with interested and affected parties on important topics as they arise. The Village executive committees were invited to the board room after the familiarisation tours.
As result of damage to the roads on the original cyanide transport route, a temporary alternate route was chosen which is a longer route. Before deliveries commenced, community officers conducted cyanide awareness sessions at 31 additional communities between April and May 2019. Minutes were kept for each session and Villagers asked a

series of questions about cyanide. These included "Can I have some cyanide for pest control purposes?", "Have there been any cyanide incidences at the Mine?", "Is cyanide contaminating my drinking water?", "Is the rain water contaminated by cyanide?", and "How is the Mine protecting us from cyanide?" Sampled minutes from Nyamigota Village meeting on 14 May 2019 and Chibingo Village on 15 May 2019. Sighted cyanide awareness time table for villages located along the cyanide transportation route (Kahama to Geita via Ushilombo), April to May 2019, listing the 31 communities and the dates to be visited.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 9.2**

 not in compliance with

Basis for this Finding/Deficiencies Identified:
Dialogue meetings are two-way dialogue sessions involving both dissemination of information and the answering of questions on cyanide.
Community Department Officers visit the surrounding villages to communicate on mine affairs monthly. All villages and communities are identified and include:- Saragulwa, Nyamwilolelwa, Nungwe, Lwenge, Kifufu, Isamilo, Kasota, Nyansalwa, Nyawilimilwa, Nungwe, Bugalama, Ntinachi, and Nyawilimilwa. The mine also communicates with the wards of Nyankumbu, Kalangalala, Mtakuja, Mgusu, and Nyamwilolelwa which are wards in Geita town.
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"How is the Mine protecting us from cyanide?" Sampled minutes from Nyamigota Village meeting on 14 May 2019 and Chibingo Village on 15 May 2019. Sighted cyanide awareness time table for villages located along the cyanide transportation route (Kahama to Geita via Ushilombo), April to May 2019, listing the 31 communities and the dates to be visited.

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

X in full compliance with

The operation is

- ☐ in substantial compliance with **Standard of Practice 9.3**
- ☐ not in compliance with

Basis for this Finding/Deficiencies Identified:
A printed copy of the Swahili presentation and a brochure is made available to the attendees. There are high levels of literacy (80%) amongst stakeholders and most communication is in Swahili. Information is given to committees in the form of presentations in Swahili, to cover any potential illiterate members. A Cinema is used to show and present cyanide transport and cyanide activities and information. It was reported that more than 500 people attended the cinemas.
All lost time injuries and fatalities must be reported to the Resident Mines Officer (Government Official in Geita) who in turn reports to the Mining Commissioner. The mining authorities do not make this information public. The Mine distributes safety flashes on the notice boards throughout the mine and these are discussed at toolbox talks as well as HSE reps meetings. The MD's quarterly feedback meeting to the workforce includes injuries and major incidents, including cyanide.
A Group wide Workforce Management Reporting System (WMRS) is used as an electronic reporting platform for all safety and environmental incidents, inspections and deviations. The incident classification used (an AGA management standard) is Minor, Moderate and High and Major or Extreme. Classification of incidents is according to an integrated table included in the WMRS software.
The AGA Annual sustainable Development Reports for 2017 (https://www.anglogoldashanti.com/sustainability/reports/#2017) and 2018 (http://www.aga-reports.com/18/sdr#home) were reviewed to confirm references to cyanide incidents in the AGA Group.