Tarkwa Gold Mine - International Cyanide Management Code Recertification Audit

Summary Audit Report

Gold Fields Ghana Limited

Prepared by:

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Basis of Report

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Table of Contents

Basis of Report ii
1.0 Summary Audit Report for Gold Mining Operations 1
2.0 Location and description of operation 1
Principle 1 – Production and Purchase 5
Principle 2 – Transportation 6
Principle 3 – Handling and Storage 8
Principle 4 – Operations 14
Principle 5 – Decommissioning 35
Principle 6 – Worker Safety 38
Principle 7 – Emergency Response 45
Principle 8 – Training 55
Principle 9 – Dialogue and Disclosure 61

Acronym / abbreviation	Description
CIL	Carbon-in-Leach
CN	Cyanide
ERT	Emergency Response Team
HCN	Hydrogen Cyanide
HDPE	High Density Polyethylene
Hebei	Hebei Chengxin Co. Ltd
HOD	Head of Department
HR	Human Resources
HSE	Health, Safety and Environment
ICMC	International Cyanide Management Code
ICMI	International Cyanide Management Institute
IFC	International Finance Corporation
ILR	Intensive Leach Reactor
LOM	Life of Mine
OEM	Original Equipment Manufacturer
PMS	Planned Maintenance System
PPE	Personal Protective Equipment
ppm	Parts Per Million
PTO	Planned Task Observation
ROM	Run-of-Mine
SAG	Semi-Autogenous Grinding
SCADA	Supervisory Control and Data Acquisition
SDS	Safety Data Sheets
SLR	SLR Consulting (Ghana) (Pty) Ltd
SOP	Standard Operating Procedure
Tarkwa	Tarkwa Gold Mine
The Code	The International Cyanide Management Code for the Manufacture, Transport, And Use of Cyanide in the Production of Gold and Silver
The Plant	Tarkwa Gold Plant
The Protocol	The Mining Operations Verification Protocol
TMCCC	Tarkwa Mine Community Consultative Committee
TSF	Tailings Storage Facility
UNEP	United Nations Environmental Program
WAD	Weak Acid Dissociable

1.0 Summary Audit Report for Gold Mining Operations

Name of Cyanide User Facility:	Tarkwa Gold Plant
Name of Cyanide User Facility Owner:	Gold Fields Ghana Limited
Name of Cyanide User Facility Operator:	Gold Fields Ghana Limited
Name of Responsible Manager:	Prince Essuah, Metallurgical Manager
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2.0 Location and description of operation

Location detail and description of operation:

Tarkwa Gold Mine is an open cast gold mine that is majority owned and operated by Gold Fields Ghana Limited (GFGL) (90%) and the Ghanaian Government (10%). It is situated in the Western Region of Ghana, approximately 350 km by road from the capital, Accra. Site conditions are tropical with annual rainfall of approximately 2,000 mm and temperature ranging between 25ºC and 35ºC.

In June 1993 the Government of Ghana entered into an agreement with GFGL for the operation of the mine by GFGL under a management contract. GFGL developed a heap leach surface mining operation. The initial development, Tarkwa Phase 1, was completed in April 1998 processing 4.7 million tonnes per annum (Mtpa) heap leach feed ore. An expansion, Phase 2, was completed in July 1999 increasing ore production to the heap leach to 7.2 Mtpa. Process improvements and optimisations resulted in the throughput increasing to 9.4 Mtpa. In August 2000, GFGL acquired the northern part of the Teberebie lease.

These facilities increased ore production to the heap leach to 16 Mtpa. The north heap leach has had a number of pad expansions, the latest Phase 5, to enable current production capacity to be sustained.

Cyanide addition ceased on the south heap leach in October 2012 with leaching continuing for a period thereafter. The south heap leach has been decommissioned. The north heap leach cyanide addition ceased in September 2014. The mixing facility for the north heap leach has since been decommissioned.

Solid cyanide is purchased from five different suppliers each of whom have a manufacturing facility that is certified as being in compliance with the Code. The cyanide is delivered as solid cyanide in one tonne boxes which are stored in the cyanide storage area before being taken to the mixing area where they are dissolved to create the cyanide process solution for the Plant. The red Carmosine dye is also added at this time. The packaging for the solid cyanide is taken by the cyanide transporter to their licenced incinerators in Tema, Accra.

The Tarkwa Gold Mine carbon in leach (CIL) plant was commissioned in October 2004 and utilised a single semi-autogenous grinding (SAG) mill, designed to mill 4.2 mtpa (525 tonnes per hour). Through the installation of a ball mill, along with additional upstream and downstream equipment, the plant has now been expanded to 14 mtpa (1,700 tonnes per hour).

The CIL circuit consists of two trains of eight tanks in series fed from a common leach tank. The loaded carbon passes into a 15-tonne acid wash column. The gold is recovered from the loaded carbon in two 15 tonne elution circuits. Gold is recovered from solution by electrowinning and smelted in the CIL smelt house in an induction furnace.

All of the ore is now processed through the CIL. In 2018 a new Acacia gravity separation system (intensive leach reactor - ILR) was installed at the plant due to the amount of coarse gold in the ore being supplied to the plant. This includes a Knelson concentrator as part of an ILR. The gravity separation system was commissioned in August 2018.

The operation utilises hydrogen peroxide which is set up in close proximity to the CIL tailings hopper for cyanide destruction in CIL tails, if required, before deposition at the tailings storage facilities. Tailings from the plant is deposited in the Tarkwa Gold Mine tailings storage facilities (TSF's), which are paddock type impoundments located approximately 3 km northwest of CIL plant site and immediate south of the existing north leach pads. The TSFs are comprised of TSF 1,2,3 and 5. TSF 5 was commissioned in 2018. TSF 3 is currently being decommissioned. TSF 1 has not been used since the previous recertification audit and is not currently being used. TSF 2 and 5 are being used for the deposition of tailings. TSF 2 Stage 8 Wall Raise has been completed since the last recertification audit. The construction of TSF 5 Stage 3 Wall Raise was being undertaken at the time of the audit.

Water from the decant pond is returned to clarifiers at the plant, from where it is then used in the process. The return water was shown to have a WAD cyanide concentration less than 0.5 mg/l and therefore the return water pipeline and the clarifiers are not classed as cyanide facilities.

The mine has a water treatment facility that treats ex-heap leach effluent. The treatment plant employs a stage-by-stage technology such as pre-filtration process, screen filtration, ultra-filtration and reverse osmosis to deal with suspended solids, dissolved solids (monovalent and multivalent ions) and microbes (bacteria and viruses) to achieving purification parameters with reduced conductivity levels to 300 µS/cm (microsiemens per centimeter) from feed conductivity of 2800 µS/cm. Final discharge to the environment is permitted by the mine's Environmental Department after sampling and testing from the surveillance points, with free cyanide in the discharge being below 0.022 mg/l.

SUMMARY AUDIT REPORT

Auditors Findings

Tarkwa Gold Plant is:	☒ **in full compliance with**	**The International Cyanide Management Code**
	☐ in substantial compliance with	
	☐ not in compliance with	

Audit Company:	SLR Consulting (Ghana) Ltd
Audit Team Leader:	Ed Perry, Lead Auditor
Email:	eperry@slrconsulting.com
Mine Technical Auditor	Dawie Viljoen, Afritech (ICMI pre-certified Mine Technical Specialist).

Tarkwa Gold Mine
Name of Facility

Signature of Mine Technical Auditor

26 September 2025
Date

COMPLIANCE STATEMENT

Tarkwa Gold Mine, Ghana has not experienced any cyanide incidents or compliance issues during the previous three year audit cycle.

NAME OF OTHER AUDITORS

Dawie Viljoen

DATES OF AUDIT

The Recertification Audit was undertaken from between 8 April 2025 and 11 April 2025.

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 (ICMI) and that all members of the audit team meet the applicable criteria established by the International Cyanide Management 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

Tarkwa Gold Mine
Name of Facility

Signature of Lead Auditor

September 2025
Date

Protocol and using standard and accepted practices for health, safety and environmental audits.

The “International Cyanide Management Code for The Manufacture, Transport, And Use of Cyanide In The Production Of Gold and Silver” (the Code) was developed by a multi-stakeholder Steering Committee under the guidance of the United Nations Environmental Program (UNEP) and the then, International Council on Metals and the Environment.

The Code is a voluntary industry programme for gold and silver mining companies, and companies involved with the production and transport of cyanide to gold and silver mining companies; it focuses exclusively on the safe management of cyanide. Companies that adopt the Code must have their operations, which manufacture cyanide, transport cyanide or `use cyanide to recover gold and silver, audited by an independent third party to determine the status of the Code’s implementation. Those operations that meet the Code’s requirements can be certified and are able to use a unique trademark symbol, which identifies the company as a certified operation. Audit results are made public to inform stakeholders of the status of cyanide management practices at the certified operation.

The objective of the Code is to improve the management of cyanide used in gold and silver mining and assist in the protection of human health and the reduction of environmental impacts (refer to www.cyanidecode.org). The Code is managed by the International Cyanide Management Institute (ICMI).

Principle 1 – Production and Purchase

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.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 1.1**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 1.1; to 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.

Tarkwa purchases solid cyanide from five different suppliers each of whom have a manufacturing facility that is certified as being in compliance with the Code.

The five manufacturing facilities that supply cyanide to the Tarkwa Gold mine are:

- Cyplus Wesseling, Germany (Cyplus) (ordered directly); initial certification dated 24 July 2006, current certification dated 23 January 2025.
- Hebei Chengxin Co., Ltd., P.R. China (Hebei) (ordered directly); initial certification dated 01 October 2012, current certification dated 18 April 2023.
- Orica Australia Pty Ltd., Australia (Orica) (ordered directly); initial certification 28 November 2006, current certification 31 October 2023.
- Draslovka Holdings, a.s., Czech Republic (Draslovka) (ordered directly); initial certification dated 24 March 2011, current certification dated 9 June 2025.
- TaeKwang Industrial Co., Ltd, Republic of Korea (TaeKwang) (ordered via Samsung); initial certification dated 14 April 2008, current certification dated 21 August 2023.

The site had a contract with Samsung that expired in 2023. Since then all of the other suppliers, in addition to Samsung, have supplied the site with solid cyanide based on individual purchase orders.

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.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 2.1**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 2.1 requiring 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.

The operation has chain of custody records identifying all transporters and supply chains responsible for transporting solid cyanide as detailed below.

- Solid cyanide supplied by Cyplus is shipped to the port of Tema in Ghana from where it is transported to site by Movis Logistics Limited (Movis).
- Solid cyanide supplied by Hebei is shipped to the port of Tema in Ghana from where it is transported to site by Movis.
- Solid cyanide supplied by Orica is shipped to the port of Tema in Ghana from where it is transported to site by Stellar Logistics Limited (Stellar).
- Solid cyanide supplied by Draslovka is shipped to the port of Tema in Ghana from where it is transported to site by Movis.
- Solid cyanide supplied by Samsung from TaeKwang is shipped to the port of Tema in Ghana from where it is transported to site by Vehrad Transport and Haulage Limited (Vehrad).

All identified transporters are individually certified in compliance under the Code or included in a certified supply chain.

Cyanide supplied from Cyplus is transported under the Supply Chain #1, Wesseling Plant to International Ports of Entry which included the transport of solid cyanide from the manufacturing site in Wesseling, via the Ports of Hamburg and Antwerp to various ports worldwide. The Supply Chain #1's latest recertification was on 6 August 2024. The transporter used in Ghana to transport the solid cyanide from the Port of Tema to the mine is Movis who was most recently recertified on 13 January 2023.

The Hebei Chengxin Transport Global Ocean Supply Chain includes road transport by Hebei Chenxin Transport from Hebei Chengxin's production facility to departure ports Qingdao, Shanghai, Tianjin, Lianyungang and ocean transport using ocean carriers CMA CGM, Hapag Lloyd, KMTC, Maersk, MSC, Hamburg Sud and Swire Shipping from departure ports to destination ports, including the port of Tema in Ghana. The Hebei Chengxin Transport Global Ocean Supply Chain was recertified against the Code on 30 October 2023. The transporter used in Ghana to transport the solid cyanide from the Port of Tema to the mine is Movis who was most recently recertified on 13 January 2023.

The Orica Global Marine Supply Chain includes transport from the manufacturing site at Yarwun, Australia to various ports including TEMA by ocean transport of cyanide. The Global Marine Supply chain was last recertified on 02 December 2024. The transporter used in Ghana to transport the solid cyanide from the Port of Tema to the mine is Stellar who was most recently recertified 04 December 2024.

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 9 August 2024. The transporter used in Ghana to transport the solid cyanide from the Port of Tema to the mine is Vehrad who was most recently recertified on 05 September 2024.

Transport of solid cyanide supplied from the Draslovka manufacturing facility in the Czech Republic to European Ports is part of the Czech republic Supply Chain No.1 that was certified on 17 July 2024. The transporter used in Ghana to transport the solid cyanide from the Port of Tema to the mine is Movis who was most recently recertified on 13 January 2023.

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Principle 3 – Handling and Storage

Protect Workers and the Environment During 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.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 3.1**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 3.1; design and construct unloading, and storage 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 including the solid cyanide storage shed, cyanide mixing tank, cyanide storage tank, tank foundations, piping and secondary containment structures 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 facilities consist of a solid cyanide storage shed and a cyanide mixing tank, located at the external reagents area, and a cyanide storage tank, located at the internal reagents area. The original steel cyanide mixing and storage tanks were replaced with fibre glass tanks in 2020. The new fibre glass tanks were manufactured in accordance with the original specifications and designs drawings for the original tanks, designed by Lycopodium (2003).

The solid cyanide unloading and storage facilities, mixing and liquid cyanide storage tanks are located away from people and surface waters as observed by the auditors during the site visit. It was verified during the site audit that the cyanide boxes together with the cyanide mixing tank are located in the external reagents area which is an access controlled part of the wider mine, which in itself is also access controlled. The cyanide storage tank is located within the Plant that is located within the wider mine area and has strict security protocols for entrance and exit. The Plant and external reagent area are approximately 5 km from the nearest settlement.

The unloading of liquid cyanide is not applicable as the Plant only uses solid cyanide briquettes.

There are systems in place to prevent the overfilling of cyanide storage tanks, and the systems are tested and maintained on a routine basis as part of the planned maintenance system (PMS). The cyanide mixing and liquid storage tanks are both equipped with level indicators and alarms linked to the Control Room. The auditors observed level and alarm setting on the SCADA system where the high level alarm is set at 80% for both the mixing and liquid storage tanks.

Transfer of liquid cyanide from the mixing tank to the liquid storage tank is only done once the Control Room operator has checked that the level in the liquid storage tank is below 40% as the volume of the mixing tank is less than 40% of the liquid storage tank and therefore at this level it cannot be overfilled. There is an added safety mechanism in that the tank has an automatic cut off at the 80% fill point. In addition, the valves are automatically closed to prevent any syphoning.

This is detailed in the following procedures observed by the auditors.

- *Sodium Cyanide Mixing Start Up TGM 4.60.005 PR dated 16 May 2024.*
- *Cyanide Transfer from Mixing Tank to Storage Tank TGM 4.60.005 PR dated 16 May 2024.*

The procedures include, checking the levels of the mixing and storage tanks before a mixing event starts.

Site inspection verified that the mixing tank in the external reagents area as well as the dosing tank in the CIL area, are constructed on a concrete plinth in a concrete bunded area overlain by chemical resistant bricks, providing a competent barrier to provide a competent barrier to leakage and prevent seepage to the subsurface.

The following was confirmed during the site inspection that cyanide is stored:

a) Under a roof, off the ground, or with other measures to minimise the potential for contact of solid cyanide with water.

   The cyanide boxes in the reagent area are stored under a roof, on a concrete surface and stored on wooden pallets so that they are not in direct contact with the concrete flooring. Any liquid within the storage area drains to a perimeter drain.

b) With adequate ventilation to prevent the build-up of Hydrogen Cyanide (HCN) gas.

   The storage area for the solid cyanide is open on two sides in order to provide adequate ventilation. There is a significant overhang of the roof to prevent the boxes being exposed to rainwater.

   Both the mixing tank in the external reagents area and the storage tank in the CIL area are in an open air environment equipped with ventilation pipes.

c) In a secure area where public access is prohibited, such as within the fenced boundary of the Plant.

   The external reagents area where the cyanide boxes are stored and the mixing carried out, is located within a fenced and locked area with clear signage indicating that cyanide is stored in the area. There is also a security gate with guards 24 hours a day to control

vehicle access prior to entrance into the reagents area. This is within the wider mine site that is also access controlled.

The liquid cyanide storage tank is located within the Plant that has strict protocols for entry and exit and is again located within the wider mine site.

d) Separately from incompatible materials, such as acids, strong oxidisers and explosives and apart from foods, animal feeds, and tobacco products with berms, bunds, walls or other appropriate barriers that will prevent mixing.

During the site inspection, the auditors verified that the cyanide boxes are stored separately from incompatible material, within a dedicated storage shed.

The cyanide mixing and dosing tanks are also located separately from any incompatible material, within their own bunded areas each being equipped with a sump and sump pump.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 3.2**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 3.2; operate unloading and storage using inspections, preventative maintenance, and contingency plans to prevent or contain releases and control and respond to worker exposures.

With respect to empty cyanide containers, procedures are in place and implemented to:

a) Prevent empty cyanide containers from being used for any purpose other than holding cyanide.

   The empty storage containers (comprising wooden boxes, bulk bag inners and plastic bags liners) are dismantled and packed in sea containers to prevent any unauthorised use of the boxes. Stellar removes all of the sea containers with the empty boxes from the site transporting them to the Orica local warehouse. Orica then transports the containers to the Vehrad yard in Tema for incineration at an authorised incinerator.

   This is detailed in the following procedures.

   - *Dismantling Empty Cyanide Boxes, TGM 4.60.023 PR, dated 7 August 2024.*
   - *Loading of Dismantled Cyanide Boxes into Sea Container, TGM 4.60.024 PR, dated 25 May 2024*

b) Rinse empty cyanide drums, plastic bags and liners with water three times and add the rinse water to the cyanidation process or otherwise disposed of in an environmentally sound manner?

   The woven polypropylene bags, outer plastic bags, and boxes are not washed prior to being placed back in the sea containers. This is acknowledged by Vehrad and Stellar as standard procedure and the necessary health and safety precautions are undertaken when unloading the sea containers by Vehrad at their incinerator.

c) Burn or otherwise dispose of empty wooden crates in an environmentally sound manner?

   The empty storage containers (comprising wooden boxes, bulk bag inners and plastic bags liners) are placed back in the sea container in which they arrived, securely closed

and transported by Stellar to the Orica local warehouse. Orica then transports the containers to the Vehrad yard in Tema for incineration at an authorised incinerator.

d) Clean any cyanide residue from the outside of cyanide containers that are returned to the vendor and securely close them for shipment

The woven polypropylene bags, the outer plastic bags and boxes are not washed prior to being placed back in the sea containers. This is acknowledged by Stellar and Vehrad as standard procedure and the necessary health and safety precautions are undertaken when unloading the sea containers by Vehrad at their incinerator.

The operation has developed and implemented procedures to prevent exposures and releases during cyanide unloading and mixing activities.

The procedures listed below were reviewed by the auditors.

e) Operation and maintenance of all hoses, valves and couplings for unloading liquid cyanide and mixing solid or liquid cyanide.

- *Sodium Cyanide (NaCN) Mixing Start Up, TGM 4.60.005 PR, dated 16 May 2024.*

This procedure includes the following: detailed sequencing of events from start to finish of mixing including the operation of all hoses, valves and couplings; specific PPE requirements; the addition of NaOH to the tank to ensure correct mixing pH; the addition of dye; and the buddy role is described in the procedure as well as in the emergency response plan.

The maintenance of all hoses, valves and couplings are included in the preventative maintenance system.

f) Handling cyanide containers without rupturing or puncturing.

- *Offloading Sea Containers from Trucks, TGM 4.60.010 PR, dated 16 May 2024.*
- *Offloading & Storage of Sodium Cyanide from Sea Container, TGM 4.60.012 PR, 16 May 2024.*

These procedures detail how the cyanide containers should be handled on site.

g) Limiting the height of stacking of cyanide containers.

- *Offloading & Storage of Sodium Cyanide from Sea Container, TGM 4.60.012 PR, 16 May 2024.*

This procedure states that stacking height of solid cyanide boxes is limited to 2 containers high.

h) Timely cleanup of any spills of cyanide during mixing and transfer of liquid cyanide from tanker trucks and isotainers.

The following procedures detail the timely clean-up of spills as well as the mine emergency response plan, which give clear instructions on how to address any clean-up of spills during a mixing event.

- *Handling Dry Sodium Cyanide Spill (Sea Containers) TGM 4.60.001 PR, 16 May 2024.*
- *Handling Dry Sodium Cyanide Spill (Split Bag) TGM 4.60.002 PR, 16 May 2024.*
- *Handling Cyanide Solution Spill, TGM 4.60.002 PR, 16 May 2024.*

i) Providing for safe unloading of liquid cyanide and manual mixing of solid cyanide by requiring appropriate personal protective equipment and having a second individual observe from a safe area, or observe remotely by video?

Section 6.0 of all of the procedures include the specification of PPE to be used.

The actual mixing is performed by two individuals (one forklift driver that opens and prepares the cyanide bags, while the other operator manoeuvres the crane and empties the cyanide into the tank). A third person acts as buddy and observes the mixing. This was observed by the auditors during a mixing event.

- *Sodium Cyanide Mixing Start Up, TGM 4.60.005 PR, 16 May 2024*.

This procedure states in Section 8, no.6, ‘get a sentry on standby to observed proceedings and be ready to attend to any emergency’.

j) Addition of colorant dye to solid cyanide prior to or at the point of mixing into solution and/or provisions for the addition of colorant dye to high-strength liquid cyanide prior to delivery at the mining operation.

It is confirmed during the site visit that the red Carmosine dye is added during the mixing operation as part of the process loading the briquettes into the mixing tank. The high strength process solution was observed to be dyed through observation of the dosing point.

- *Sodium Cyanide Mixing Start Up, TGM 4.60.005 PR, 16 May 2024.*

This procedure states in Section 8, no. 13, ‘add 350 g of Carmosine Red Dye’.

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 preventative maintenance procedures.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 4.1**

☐ not in compliance with

Summarise the basis for the findings/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 preventative maintenance procedures.

Tarkwa Gold Mine has developed a number of procedures for the operation of cyanide facilities including general cyanide safety and handling procedures, CIL plant procedures, TSF procedures and water treatment procedures. There are 28 general cyanide procedures, and 239 other procedures.

The procedures that were observed include the following:

- *Sodium Cyanide Mixing Start Up, TGM 4.60.005 PR, 16 May 2024*
- *Cyanide Transfer from Mixing Tank to Storage Tank TGM 4.60.005 PR dated 16 May 2024*
- *Dismantling Empty Cyanide Boxes, TGM 4.60.023 PR, dated 7 August 2024.*

The operation does not have a stand alone cyanide treatment facility but utilises hydrogen peroxide which is set up in close proximity to the CIL tailings hopper for cyanide destruction in CIL tails, if required, before deposition at the tailings storage facilities. This is an integral part of the CIL operations and does not require a separate procedure.

The operation does not have a heap leach, cyanide treatment, regeneration or disposal systems. Chemicals are added to the Tailings Tank at the end of the CIL process if required to reduce the level of WAD cyanide below 50 ppm as detailed in *Cyanide Emergency Response Plan (CERP), TGM 4 002 PR, 30 October 2024*. Section 6.3.11 Failure of Detoxification Facilities.

The TSF Manuals include the following:

- *Tarkwa Mine TSF OMS (operation, maintenance and surveillance) Manual, 14 June 2024*. This includes the day to day operation, maintenance, surveillance and monitoring requirements of TSF 1,2,3 and 5.

The operation's plans or procedures identify and account for the assumptions and parameters on which the facility design was based and any applicable regulatory requirements as necessary to prevent or control cyanide releases and exposures consistent with applicable requirements, which includes the following.

Cyanide Emergency Response Plan, TGM 4.0.002 PR, 29 August 2024 states that process solutions will have a pH of 10.5 – 11.5.

TSF & Under-drain Water WAD Cyanide > 50 ppm, TGM 4.90.005 PR, 14 June 2024 states that any seepage >50 ppm WAD Cyanide at the TSF area should be contained, pumped back, and /or detoxified.

TSF Manuals:

Tarkwa Gold Project, TSF 5 Stage 3 Wall Raise Design – Operations Manual, 25 February 2023 states that the freeboard is 1.0 m above the beach and 2.0 m above the pond. The storm capacity design is 1:100 year 24 hour storm event of 244 mm and 1:1000 year 24 hour storm event of 408 mm.

TSF 2 Stage 9 Design Report, 24 November 2023 states that the freeboard if 1.0 m above the level of a 1:100 year 24 hour storm event which is the equivalent of 1.75 m above the pond. In addition to the 1:100 year and 1:1000 year storm events the design includes the capacity to accommodate a 1:10,000 year 24 hour storm event of 669 mm.

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 preventive maintenance activities.

Water Management.

TSF Complex Water Balance, June 2023 describes all water balance parameters, the operations and assumptions of the water balance, including normal, abnormal and emergency.

Plant Area inspections include the following:

Daily

External Reagent Checklist, which includes cyanide emergency room including oxypac and antidote, fixed monitors, SDS, conditions of tanks, bunds, valves and pipes.

CIL Tanks Checklist, which includes fixed CN monitors, man down alarms, safety showers, fire extinguishers, first aid room, oxypac and antidote.

Internal Reagent Checklist. Cyanide Storage Tank, which includes sump pump, wildlife mortalities, bund condition, SDS, conditions of tanks, bunds, valves and pipes, safety showers, man down alarms, fire extinguishers, first aid room, antidote and oxypac.

Spill Containment/ Detox Shed, which includes Event Pond, wildlife mortality, hydrogen peroxide is present, safety showers.

Elution and Water Services, which includes pipes, valves, flanges, sump pumps, safety showers and fire extinguishers.

Hospital Cyanide PPE, which includes the inspection of PPE and cyanide antidote.

Ambulance Equipment Checklist, which is the inspection of equipment in the ambulance undertaken on a shiftly basis.

Monthly

Fire Extinguisher. for visual inspection included on the fire extinguisher.

Quarterly

Thickness testing (undertaken by Goldfields) excel sheet showing the results of thickness testing for the CIL tanks was observed.

Asset Integrity Threats and Control Strategies, reviews the structural integrity of the Plant. This was observed for the CIL/Milling Plant, in addition an action tracker was observed showing the items in the structural integrity reports and the progress with regards to their completion.

Annual

Annual Service Records for Fire Extinguishers, internal servicing record sheet.

Every two years

Third party thickness testing is undertaken every two years

Ultrasonic Wall Thickness Inspection Report of CIL Tanks undertaken by Mare Analab Limited, 12 September 2024, all tanks were found to be in good working order, signed by Francis Annobil, Level III inspector.

Cyanide Mixing Tank and Storage Tank Thickness Testing, undertaken by Inspectors and Engineers (third party company), 09 September 2024, signed by Anthony Baidoo, HND MechEng stating that the tanks are in a good condition.

Visual Structural Inspection Report of Goldfields Tarkwa Mine, undertaken by DRA, September 2023, details the condition of the concrete and steel for the Plant. An action plan was observed with all of the critical actions having been completed.

Tailings area, inspections include the following (only TSF 2 and 5 are currently used):

Daily

TSF2 and TSF 5 Daily Checklist, which includes pipeline integrity, tailings deposition, integrity of embankment, decant barge, tailings level vs embankment crest, wildlife.

Weekly

TSF Weekly Checklist, which includes freeboard, embankments and seepage. This covers all of the TSFs.

Monthly

TSF Monthly Checklist, which includes underdrainage system, embankment, monitoring boreholes, and surface water diversions.

Quarterly

TSF Environmental Audit Report, by Glocal Engineering Ltd., which includes, operations management, tailings characteristics, deposition and beach management, supernatant pond, freeboard, drainage system, water management

Planned Maintenance System

The SAP (Systems Application and Product) PMS is used for planned and preventive maintenance as well as for corrective maintenance. Most of the equipment is on a monthly schedule of preventive maintenance, but variations may occur depending on the equipment. A list of the equipment within the PMS was observed including: tanks, pumps, inline pH monitor, fixed cyanide monitors, WAD analyser, cyanide analyser, safety showers, and generators. Inspections include mechanical and electrical. All activities undertaken in the SAP system are documented electronically, which were observed by the auditors.

Job cards are also raised through the SAP system where ad hoc maintenance is required by inspections of the Plant or observations from Plant Operators.

The operation implements procedures to review proposed changes to production processes, operating practices, or cyanide facilities to determine if they may increase the potential for cyanide releases and worker exposures and incorporate any measures necessary to protect worker health and safety and the environment.

- *Management of Change HSMP 5.3 PR, 4 June 2024.*

The procedure details the change management process used at Tarkwa Gold Mine to ensure a structured approach is applied to the management of change on site and information relating to changes to our business is communicated to all interested and affected parties.

A Change Committee is put together with representatives from all affected services disciplines and will be involved during the risk assessment process, these will include Protection Services, Health and Safety, Environment, Finance, Information Technology, Engineering, etc. The Management of Change Form is signed off by the Heads of Department that are affected by the change.

The operation has cyanide management contingency procedures for non-standard operating situations that may present a potential for cyanide exposures and releases.

The operation has developed a number of procedures for contingencies and non-standard operating conditions, including the following:

a) an upset in the operational water balance that presents a risk of exceeding the design containment capacity.
    - *Return Water Decant System and Supernatant Pond Management, TGM 4.90.017 PR, 19 September 2024.*

- *Tailings Contingency Plan, TGM 4.90.004 PR, 14 June 2024.*

These procedures indicate what to do when there is an upset in the facility's water balance. The TSF Contingency Plan includes a requirement for daily inspections and states that in the event of a loss of power the tailings discharge should cease if the minimum freeboard is encroached.

b) problems identified by monitoring or inspection,

The SAP PMS raises a work order and records the corrective actions and corrective maintenance that is being undertaken when inspections or monitoring identifies a problem.

c) and either planned or emergency shutdowns, including a temporary closure or cessation of operations.

- *CIL Train 1 Circuit shutdown, TGM 4.40.002 PR, 24 August 2024.*
- *CIL Train 2 Circuit shutdown, TGM 4.40.004 PR, 4 September 2024.*
- *Sodium Cyanide Mixing Shutdown, TGM 4.60.006 PR, 16 May 2024.*
- *Cyanide Emergency Response Plan, TGM4.0.002 PR, 29 August 2024.*

The procedures describe the actions required for the shutdown of the CIL circuit, and the cyanide mixing tank showing that temporary closure /shutdown is considered and planned for as part of normal operation of the facility. The planned shutdown can be either short term or long term.

These procedures sufficiently address how cyanide would be safely managed during long-term shutdowns or cessation of operations including the management of any cyanide solution within tanks. Solid cyanide stored in Intermediate Bulk Containers would remain in the storage shed.

If there is a loss of power the Cyanide Emergency Plan states that power should be supplied to the TSF drainage pumps. In the event of an extended power failure emergency generators will be used to flush the tailings line.

The operation inspects the following at unloading, storage, mixing and process areas, including tanks, secondary containments, pipelines, pumps, valves, and ponds. The following were observed.

a) Tanks holding cyanide solutions for structural integrity and signs of corrosion and leakage. The following inspections are undertaken to check for structural integrity, signs of corrosion and leakage:

- External Reagent Checklist – daily.
- Internal Reagent Checklist – daily.
- Quarterly Thickness Testing by internal team – quarterly.
- Asset Integrity, Threats and Control Strategies – quarterly.
- Thickness Testing by third party contractor – every two years.

b) 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. The following inspections are undertaken to check the secondary containments for tanks and pipelines.

- External Reagent Checklist – daily.
- Internal Reagent Checklist – daily.
- TSF 2 and TSF 5 daily checklist – daily.
- TSF Environmental Audit Report, - quarterly.

c) Leak detection and collection systems at ponds, as required in the design documents. The only leak detection and collections systems are for the TSFs. The Event Pond within the Plant is lined with high density polyethylene (HDPE) and should be kept empty whenever possible. The TSF collection systems are monitored as part of the following inspections.

- TSF Monthly Checklist – monthly.

d) Pipelines, pumps and valves for deterioration and leakage. The following inspections are undertaken for deterioration and leakage of pipelines, pumps, and valves.

- External Reagent Checklist – daily.
- Internal Reagent Checklist – daily.
- TSF 2 and TSF 5 daily checklist – daily.
- TSF Environmental Audit Report, - quarterly.

e) 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 Plant Event Pond is kept empty wherever possible. This was observed by the auditors during the site visit. The freeboard at the TSFs, and integrity of the surface water divisions are observed and measured during the following inspections.

- TSF 2 and TSF 5 daily checklist – daily.
- TSF Monthly Checklist – monthly.
- TSF Environmental Audit Report, - quarterly.

The operation inspects the cyanide facilities on an established frequency sufficient to ensure and document that they are functioning within design parameters as detailed below.

- The internal and external reagent areas are inspected on a daily basis.

- The structural integrity of the Plant is inspected on a quarterly (internal) and two yearly (external) basis.
- The TSF is inspected on a daily, monthly, and quarterly basis.
- Assets detailed within the PMS are usually inspected on a monthly basis with some items e.g. generators being inspected on a frequency determine by their use.

For the preventive maintenance, inspection activities are being undertaken as required by the specific piece of equipment, with the period being anything between daily to yearly. The records are on the SAP PMS.

It is concluded that the inspection frequency is adequate to assure that the facility operates within design parameters.

The inspections are documented. The inspection reports and checklists identify the specific items to be observed and include the date of the inspection, the name of the inspector, and any observed deficiencies. The nature and date of the corrective action is documented through the SAP planned maintenance system where the work orders are generated. The records are retained through the SAP PMS, which was observed by the auditors.

The mine undertakes a number of operational inspections as well as health and safety inspections to ensure the facility is being operated in a safe and environmentally sound manner, the inspections records reviewed during the audit are detailed above.

A preventive maintenance program is implemented, and activities documented to ensure that equipment and devices function as necessary for safe cyanide management. Preventive maintenance activities are programmed in the SAP PMS which schedules all preventive maintenance activities for the mine. All work orders issued on SAP are kept in the system to track the maintenance history of each piece of equipment. Job cards are also raised where ad hoc maintenance is required by the Plant following inspections.

The operation has the necessary emergency power resources to operate pumps and other equipment to prevent unintentional releases and exposures in the event its primary source of power is interrupted. Two generators provide back-up power to the Plant. When the power is interrupted the mill valves open automatically and it drains by gravity to a large concrete bund area, the 'swimming pool'. This was observed during the site visit and it was confirmed that the ‘swimming pool’ is able to contain the content of both mills.

The cyanide pipeline has a non-return valve and the solution will remain in the pipeline in the event of a power failure.

The generators are tested weekly and maintenance is undertaken as required. This is managed through the preventative maintenance on the SAP system. The service of the back-up generators after 1912 hours, including inspection sheet showing the items that were checked.

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

The operation is

☒ **in full compliance with**

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

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 4.2; introducing management and operating systems to minimise cyanide use, thereby limiting concentrations of cyanide in mill tailings.

The operation implements a program to evaluate cyanide use in the Plant and adjust the addition rate to minimize its use. The cyanide reduction programme consists of having a set point, monitoring cyanide content, and undertaking cyanide addition control via the TAC 1000 analyser.

Bottle roll tests and external testing is used to determine the solid losses in the Plant (gold still locked up in the ore). Gold reconciliation is used to determine the percentage recovery. The Tarkwa Plant conducts daily bottle roll Plan Leaching Simulation tests. The tests are conducted at different cyanide concentrations on a daily composite sample of the feed to the Leach tank No 1. The test results are evaluated daily by the Metallurgist and the cyanide addition setpoint is adjusted accordingly.

The set point at the time of the audit was set at 210 ppm free cyanide. This setpoint was confirmed on 19 March 2025 in the Plant log sheet as observed by the auditors. The setpoint was changed on 13 January 2025 from 195 ppm to 210 ppm based on the results of the daily bottle roll Plan Leaching Simulation Tests result.

External Leaching tests are conducted including cyanidation and diagnostic leaching at the University of Mines and Technology, Tarkwa. The auditors observed leaching kinetics and reagent consumption studies on pit samples. The indication of the presence of coarse gold particles was noted thus requiring longer leach time or higher cyanide concentrations.

Tests were undertaken to determine the level of gravity recoverable gold. This determined there were sufficient levels to justify the installation of a new gravity separation system including a new inline leach reactor. This extracts the coarse gold reducing levels of cyanide allowing the WAD levels in the tailing to be reduced.

All test indications are that the characteristics of the ore sources are not significantly variable, with insignificant base metal mineralogy that would impact on WAD cyanide level in the tailings. The operation implements a program of manual or automated sampling and analysis of tailings to determine residual cyanide levels and to allow for the adjustment of addition rates in real time as necessary to maintain optimal dosing.

A real time cyanide adjustment system is in place. The control is based on a feed forward ratio control system with the thickener underflow tonnage and with the TAC 1000 on-line free cyanide analyser results, which are included in the control loops.

The free cyanide setpoint is set on the TAC 1000 (cyanide controller) and the corresponding setpoint is included on the SCADA. The cyanide analyser reads the level of cyanide in the common tank sending a signal to the variable speed pump via the Manta software to adjust addition rates according to the setpoint. The cyanide addition rate is adjusted using variable speed hose pumps from the cyanide dosing and storage tank.

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

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

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 4.3; implement a comprehensive water management programme to protect against unintentional releases.

The operation has developed a comprehensive, probabilistic water balance the *TSF Complex Water Balance, June 2023.*

It was confirmed that the water balance modelling is using the Goldsim software which is comprehensive and probabilistic. The model uses the daily precipitation records together with 34 years of historic rainfall records to model the uncertainty and variability in the prediction of precipitation patterns, including the ability to consider the frequency and distribution of precipitation events along with extremes and seasonal variations.

The previous water balance model was reviewed as part of the previous recertification audit with the model providing a water balance from 2020 to 2025. The current model is being updated as required to take into account flow meters as they are installed. The water balance considers the following in a reasonable manner and as appropriate for the facilities and the environment. The water balance model includes the following:

a) The rates at which solutions are applied to leach pads and the rates at which tailings are deposited into tailings storage facilities. It was confirmed that the model includes the quantity of slurry from the Plant pumped to each of the TSFs. TSF 2 and 5 are currently being used.

b) A design storm duration and storm return interval that provides a sufficient degree of probability that overtopping of the pond or impoundment can be prevented during the operational life of the facility.

   Daily rainfall records from 1988 to 2022 were used to determine various return periods using the General Extreme Value. A 1:100 yr 24 hour rainfall event (244 mm) and a 1:10,000 yr 24 hour rainfall event (669 mm) and a 7 day rainfall event (1430 mm) was used. This data has been used to provide a conservative working limit of 20% of the maximum size of the TSF pond, which has been built into the model. The TSF ponds are surveyed on a monthly basis for this to be included into the model. The auditors observed the following report, Supernatant Surface Water Area, March 2025 showing the drone survey of the TSFs and a calculation of the pond size as a percentage of the maximum size.

c) The quality of existing precipitation and evaporation data in representing actual site conditions. The water balance considers the quality of existing precipitation and evaporation data in representing actual site conditions. The rainfall is used in the model is the average from 6 gauges across the site. The evaporation is calculated as 37% of the Maximum Annual Precipitation (MAP).

d) The amount of precipitation entering a pond or impoundment resulting from surface run-on from the up gradient watershed, including adjustments as necessary to account for differences in elevation and for infiltration of the runoff into the ground. There is very little run-on to the TSF from outside the TSF catchment area, with the only run-on being from the haul road area around the perimeter of the TSF. This is included in the model. There is no run-on for any of the other ponds e.g. Event Pond due to them being raised above the surrounding area.

e) Effects of potential freezing and thawing conditions on the accumulation of precipitation within the facility and the up gradient watershed. This is not applicable as the mine is in a tropical zone.

f) Solution losses in addition to evaporation, such as the capacity of decant, drainage and recycling systems, allowable seepage to the subsurface, and allowable discharges to surface water. Evaporation is 37% of MAP. The only discharge to surface water is from the water treatment plant that treats water from the old heap leaches and therefore does not affect the water balance. Underdrain and toe seepages were modelled using the FeFlow software and subsequently incorporated into the model.

g) The effects of potential power outages or pump and other equipment failures on the draindown from a leach pad or the emergency removal of water from a facility. In the event of a power outage emergency generators will operate the pumps for tailings to the TSFs and return water from the TSFs. In the event of an extended outage the tailings line from the Plant will be flushed and temporarily inactivated. It is a legal requirement for there to be a stand-by generator and pump at the TSF for use in the event of a power failure or equipment failure.

h) Where solution is discharged to surface waters, the capacity and on-line availability of necessary cyanide treatment, destruction. or regeneration systems. The only discharge to surface water is from the water treatment plant that treats water from the old heap leaches and therefore does not require any cyanide treatment, destruction or regeneration systems.

i) Other aspects of facility design that can affect the water balance, such as the assumed phreatic surface in a tailings storage facility. The model uses the assumption of 20% of water within the tailings being interstitial water giving rise to a calculated phreatic surface within the model.

Ponds and impoundments are designed and operated with adequate freeboard above the maximum design storage capacity determined to be necessary from water balance calculations.

The TSFs are operated with a minimum freeboard as per their design documents.

Tarkwa Gold Project, TSF 5 Stage 3 Wall Raise Design – Operations Manual, 25 February 2023 states that the freeboard is 1.0 m above the beach and 2.0 m above the pond. The storm capacity design is 1:100 yr 24 hr storm event of 244 mm and 1:1000 yr 24 hr storm event of 408 mm.

TSF 2 Stage 9 Design Report, 24 November 2023 states that the freeboard if 1.0 m above the level of a 1:100 year 24 hour storm event which is the equivalent of 1.75 m above the pond. In addition to the 1:100 year and 1:1000 year storm events the design includes the capacity to accommodate a 1:10,000 year 24 hour storm event of 669 mm

The Event Pond is kept empty where possible as observed by daily inspections.

The operating procedures incorporate inspection and monitoring activities as necessary to implement the water balance and prevent overtopping of ponds and impoundments and unplanned discharge of cyanide solutions to the environment including the following.

The freeboard at the TSFs are inspected on a weekly and quarterly basis. The TSF ponds are surveyed on a monthly basis.

The operation measures precipitation, comparing the results to design assumptions and revising operating practices as necessary. Precipitation is measured at the six gauges across the site, and in addition, freeboard and beach length (direct incidence of the precipitation) are measured on a weekly and quarterly basis and fed back to the TSF Engineer of Record.

The TSF ponds are surveyed on a monthly basis. The auditors observed the following report, Supernatant Surface Water Area, March 2025 showing the drone survey of the TSFs and a calculation of the pond size as a percentage of the maximum size. This information will result in revised operating practices where necessary.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 4.4**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

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

The operation does not have any open water where it is necessary to implement measures to restrict access by wildlife and livestock as the WAD cyanide does not exceeds 50 mg/l.

The in-line WAD analyser in Tailing Hoppers 1 and 2, associated with leach streams 1 and 2, provide a daily average of the WAD concentrations before the tailings enters the pipe for discharge at the TSF.

The data was observed from the 1 January 2022 to 7 March 2025. In that period there were only 6 exceedances from the 26 October 2024 to 01 November 2024, with the highest concentration of WAD cyanide being 81 mg/l. When the WAD cyanide goes above 50 mg/l an investigation is undertaken with the General Plant Supervisor being tasked to address the issue. The reason for this exceedance was due to one of the CIL tanks being drained for maintenance reducing the residence time and without an increase in the amount of water being added to the Tailings Tank to compensate for this.

Maintaining a WAD cyanide concentration of 50 mg/l or less in open water is effective in preventing significant wildlife mortality as no cyanide related wildlife mortalities have been recorded since the previous recertification audit. Daily inspections at the TSFs, and the Plant are checked for wildlife mortalities. No wildlife mortalities have been observed since the last recertification audit.

The operation can demonstrate that the cyanide concentration in open water in the TSF's, and solution ponds does not exceed 50 mg/l WAD cyanide. Samples of the TSF supernatant are undertaken on a weekly basis. All of the results observed between 2022 – 2025 were below 0.5 mg/l.

The Event Pond at the Plant is kept empty where possible and if it is used to contain any spillages or overflows it is cleaned up as soon as practical.

All of the heap leaches have been decommissioned.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 4.5**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard 4.5 to implement measure to protect fish and wildlife from direct and indirect discharges of cyanide process solutions to surface water.

The operation has a direct discharge to surface water from the water treatment plant that treats water from the decommissioned heap leaches. The discharge from the water treatment Plant is monitored before it is allowed to be discharged. The discharge data was observed for 2022 – 2025 with all discharges shown to be below 0.002 mg/l free cyanide.

The Suman River is monitored downstream of the discharge point (monitoring location SAE) on a monthly basis except when a discharge is occurring when it is monitored on a daily basis. All monitoring for the monitoring location was below 0.005 mg/l free cyanide.

There is no indirect discharge to the surface water, auditors reviewed the groundwater and surface water monitoring data and this does not indicate any indirect discharge with the results being below 0.005 mg/l WAD and free cyanide respectively.

All of the surface water monitoring results showed the concentration of free cyanide to be below the detection limit of 0.005 mg/l.

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 the findings/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 and other measures to manage seepage to protect the beneficial use of groundwater beneath and / or immediately down gradient of the operation. This includes the following.

- TSFs 1,2 and 3 are clay lined and TSF 5 is HDPE lined.
- All of the TSFs are equipped with finger drains and seepage collection trenches, equipped with sumps. The seepage water collected in the sumps is directed back to the respective TSF. The return water is pumped from the TSF pond to the clarifiers at the Plant for reuse. If the level of water on the TSF needs to be reduced the seepage water can be directed to the water treatment plant where it is treated before being discharged to the Suman River.
- All the TSFs have underdrain towers and pumps that reduce phreatic levels. There are also stormwater trenches to direct runoff away from the TSFs
- The Event Pond at the Plant is HDPE lined and kept empty where possible.
- Tailings distribution and return water pipelines are located in an HDPE lined trench.
- All bunds in the Plant are concrete lined.

The operation monitors for cyanide in groundwater downgradient of the site and can demonstrate that concentrations of WAD cyanide (or other species of cyanide for which there is a numerical standard established by the applicable jurisdiction) in groundwater at compliance points below or downgradient of the facility are at or below levels that are protective of identified beneficial uses of the groundwater.

The groundwater in the immediate vicinity of the Plant and TSF is used by the Tarkwa and the neighbouring mines. Further downstream the beneficial uses of groundwater downgradient of the facility are likely to include the provision of drinking water and water for livestock as this is obtained via wells abstracting water from the local groundwater.

All of the groundwater monitoring results showed the concentration of total, WAD, and free cyanide to be below the detection limit of 0.005 mg/l for 2022 – 2025.

The mine is an open pit and mill tailings are not used as underground backfill.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 4.7**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 4.7; Provide spill prevention or containment measures for process tanks and pipelines.

Spill prevention or containment measures are provided for all unloading, storage, mixing and process solution tanks. It was confirmed during the site assessment that all tanks (cyanide mixing, storage, CIL, and elution,) are located inside concrete bunds which were all in good condition. The tanks are all constructed with concrete bases. The solid cyanide storage area is equipped with concrete flooring

The secondary containment for the CIL area is a combination of the concrete CIL bund, however this is not sufficient for a whole tank. If a whole tank were to leak the CIL bund would eventually overflow at a designated point and flow by gravity to the concrete lined perimeter trench. The perimeter trench and secondary containment for the CIL are of sufficient size to contain in excess of 110% of a whole tank.

The site assessment verified that all of the mixing, storage and process tanks are located in concrete bunds providing a competent barrier to leakage. A concrete trench is located inside the perimeter of the Plant. Spillage not contained in any of the secondary containments will flow by gravity to the perimeter trench and subsequently the Event Pond that is HDPE lined.

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 as detailed below.

- External reagent area cyanide mixing tank - largest tank 45 m^3, bund area - 51.25 m^3.
- CIL cyanide storage tank - largest tank 92 m^3, bund area 113.8 m^3
- CIL - largest tank 3,255 m^3, CIL 1 Bund 714 m^3 and CIL 2 bund area 2,516 m^3, overflowing to the event pond of 2,600 m^3 as well as the main spill concrete trench of 1,144 m^3. All bunded areas are interlinked with each other and overflow to the events pond. Total volume of bunds and events pond exceeds 110% of largest tank.
- In-line Leach Reactor, largest tank 13.5 m^3, bund volume 28.0 m^3.

In addition, any leaks or spills outside the bunded areas or overflows from the bunds will flow to the Event Pond via the concrete lined perimeter drain that has a capacity of 2,600 m^3

Procedures are in place and being implemented to prevent any discharge of a cyanide solution or cyanide-contaminated water that is collected in a secondary containment area to the environment.

The following procedure details that the TSF is equipped with a pipeline to pump excess return solution to the water treatment plant. The excess solution is treated before it is tested and if of adequate quality released to the environment. Monitoring of the return water shows this to have a WAD cyanide concentration of less than 0.5 mg/l and therefore the water treatment plant is not a cyanide facility.

- *Tailings Contingency Plan TGM 4.90.004 PR, 14 June 2024,*

For the CIL mixing, storage and leaching facilities, all bunded areas are equipped with sumps and automatic sump pumps for solution collection and subsequently pumped to the CIL Common Tank, which is the first tank for CIL streams 1 and 2.

Any spills within the Plant Area or the cyanide storage and mixing area will be cleaned in accordance with the following spill procedures.

- *Handling Dry Sodium Cyanide Spill (Sea Containers) TGM 4.60.001 PR, 16 May 2024;*
- *Handling Dry Sodium Cyanide Spill (Split Bag) TGM 4.60.002 PR, 16 May 2024;*
- *Handling Cyanide Solution Spill, TGM 4.60.002 PR, 16 May 2024.*

If the spill is not able to be dealt with it will flow to the perimeter drain, from where it is then pumped to the event pond and subsequently treated and/or returned to the process.

There are no cyanide process tanks without secondary containment.

Spill prevention or containment measures are provided for all process solution pipelines to collect leaks and prevent releases to the environment.

The tailings pipe between the Plant and the TSF within the Plant is running over concrete which drains to the perimeter concrete trench. Outside the Plant the tailings pipe is running inside a HDPE lined trench with any spills draining to paddocks from where it can be cleaned up. Daily inspections are conducted of the TSF tailings line as well as the return water line.

Process solution pipelines within the Plant are installed in pipe racks are pipe in pipe such that any leaks drain back to the bunded areas. The Plant pipelines are inspected as per the shiftly inspection checklist and in accordance with the SAP PMS.

During the site inspection, the auditors confirmed that there were no areas where the cyanide pipelines could present a risk to surface water and therefore no special protection needs are required.

Cyanide tanks and pipelines are constructed of materials compatible with cyanide and high pH conditions. All tanks inside the Plant have been constructed from mild steel except for the cyanide mixing and storage tanks that are constructed of fibreglass. Cyanide process and solution pipelines within the Plant are constructed of stainless steel. The tailings pipeline is constructed of HDPE.

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.

The operation is

☒ in full compliance with

☐ in substantial compliance with **Standard of Practice 4.8**

☐ not in compliance with

Summarise the basis for the findings/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 assurance and quality control (QA/QC) 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 QA/QC for the operation's cyanide facilities were addressed in the original International Cyanide Management Code (ICMC) certification audit and the subsequent recertification audits.

The quality assurance and quality control programs for the replacement of the cyanide mixing and storage tanks with fibreglass tanks were addressed in the last recertification audit with the documentation being retained on site. There have been no substantial modifications to the Plant since the last recertification audit. Due to the age of the Plant the original QA/QC documentation is not available.

Since the 2022 recertification audit, the following construction has been undertaken on the TSFs:

- TSF 2 Stage 8 Wall Raise – completed in 2023; and
- TSF 5 Stage 3 Wall Raise – completed in 2024.

The quality control and quality assurance programs as documented in the following reports have addressed the suitability of materials and adequacy of soil compaction for earthworks and the installation of synthetic membrane liners.

- Tailings Storage Facility No.2 Stage 8 Wall Raise Construction Completion Report, 29 February 2024.
- TSF 5, Stage 3 Construction Records (as-built report), 24 February 2025.

The original quality assurance and quality control records for the Plant have not been retained. The quality assurance and quality control records for the construction of the TSFs and the replacement of the cyanide mixing and storage tanks with fibreglass tanks have been retained.

Appropriately qualified people have reviewed the cyanide facility construction and provided documentation that the facility has been built as proposed and approved for the Tailings Storage Facility No.2 Stage 8 Wall Raise. This was signed off by Alistair James, PrEng., the Engineer of Record. The TSF 5, Stage 3 Construction Records (as-built report), 24 February 2025 was signed off by Ama Nketiah, Principal Engineer on behalf of Knight Piesold.

There is no available quality control and quality assurance documentation or as-built certification for the construction of the Plant. Therefore, an appropriately qualified person has inspected those facilities and issued a report concluding that their continued operation within established parameters will protect against cyanide exposures and releases.

The auditors observed the following inspections that are undertaken every two years.

Ultrasonic Wall Thickness Inspection Report of CIL Tanks undertaken by Mare Analab Limited, 25 July 2022, 12 September 2024, , all tanks were found to be in good working order, signed by Francis Annobil, Level III inspector.

Cyanide Mixing Tank and Storage Tank Thickness Testing, undertaken by Inspectors and Engineers (third party company), 09 September 2024, signed by Anthony Baidoo, HND MechEng. stating that the tanks are in a good condition.

Visual Structural Inspection Report of Goldfields Tarkwa Mine, undertaken by DRA, September 2023, details the condition of the concrete and steel for the Plant. An action plan was observed with all of the critical actions having been completed.

In addition, the following third party reports for the TSF are produced quarterly.

TSF Environmental Audit Report, Quarter 1 2022, and Quarter 2 2024, by Glocal Engineering Ltd includes, operations management, tailings characteristics, deposition and beach management, supernatant pond, freeboard, drainage system, water management

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

The operation is

☒ in full compliance with

☐ in substantial compliance with **Standard of Practice 4.9**

☐ not in compliance with

Summarise the basis for the findings/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, surface and groundwater quality.

The operation has developed written standard procedures for monitoring activities. The following procedures were observed.

- *Water Quality Monitoring and Quality Assurance Program, TGM-ENV-ENV-01, 20 May 2023,*

The procedure addresses the groundwater borehole and surface water monitoring and includes a map showing the location, nature and denomination of all water related sampling points in and around the site

Wildlife monitoring is undertaken by the Plant and TSF personnel on a daily basis as part of the inspections and recorded on the relevant checklists.

The sampling and analytical procedures have been developed by an appropriately qualified person, the Unit Manager Environment and reviewed and approved by the Environmental Manager.

Procedures specify how and where samples should be taken, sample preservation techniques, chain of custody procedures, shipping instructions, cyanide species to be analysed, quality assurance and quality control requirements for cyanide analyses, as detailed below:

Section 3.0 describes the process to follow during sampling of groundwater, surface and discharge water.

- Section 3.4 Sample Bottle Preparation;
- Section 3.6 Groundwater Borehole Purging;
- Section 3.7 Groundwater Sampling Procedure;
- Section 3.9 describes sample preservation, storage & submission;
- Section 4.0 describes record keeping and reporting;
- Attachment 1 - map of sampling point locations;
- Attachment 2 - descriptive codes for sampling locations; and
- Attachment 5 - laboratory sample submission sheet.

Sampling conditions are documented in a fieldwork notebook, including weather, livestock/wildlife activity, anthropogenic influences, etc., as observed by the auditors.

The following was observed by the auditors;

- *The Water Quality Field Analysis Sheet, EVFAS 001 REC, 05 December 2006*, includes: sample code, sampling time, date of sample, temp, pH, electrical conductivity, turbidity, dissolved oxygen, and remarks (weather, site conditions, wildlife mortality, anthropogenic activities, etc).

Sample sheets are completed on a monthly basis during surface and groundwater sampling.

Monitoring is undertaken at frequencies to adequately characterise the medium being monitored, and to identify changes in a timely manner.

WAD cyanide monitoring is conducted at the following locations and frequencies:

- The WAD analyser in the Tailings Hopper provides a daily average
- The WAD cyanide concentration in the TSF Pond is monitored weekly.
- Groundwater boreholes are sampled monthly
- Surface water monitoring locations are sampled monthly.
- Wildlife monitoring is undertaken daily by the Plant and TSF personnel.

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.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 5.1**

☐ not in compliance with

Summarise the basis for the findings/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 and livestock.

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

The auditors observed the following.

- *2023-2025 Costed Reclamation Plan for the Tarkwa Gold Mine, 19 April 2024, SRK.*

This states that the life of mine (LOM) is 2035 and includes the following:

- Section 6.8 Progressive Rehabilitation Status
- Table 6-3 Summary Completion Progress as at 2020 for the TSFs, waste rock dumps and open pits.
- Section 8.2 Closure Vision
- Section 8.3 Closure Objectives.

This Plan adequately addresses decommissioning, which is the aspect of closure that addresses the cyanide remaining on site upon cessation of production activities and prepares the site for its closure and post closure period including the management of reagent strength cyanide and process solutions remaining in storage and production facilities.

A detailed closure plan must be submitted 60 days prior to decommissioning as required by the Ghanaian Minerals Commission (MINCOM) and the Ghana Environmental Protection Agency (EPA). Once approved by MINCOM, a detailed Gant Chart will be compiled informing the decommissioning and closure process.

The Reclamation Plan includes an implementation schedule for decommissioning activities as described in the following sections.

- Section 10 Closure Action Plan
- Section 10.5.2 Chemical Contamination that states “cyanide management will be followed where cyanide contamination is possible”
- Section 11.0 Closure Actions per Domain including; 11.5 TSF Storage Domain, and 11.6 Process Plant Domain.

These sections include a description of the domain, closure requirements, closure risks, post closure land uses, assumptions, actions and schedule. The Reclamation Plan is updated every 3 years

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 5.2**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 5.2; to establish an 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 identified in its site decommissioning or closure plan.

The mine's closure costing is undertaken annually by an external consultant with the latest version in the following document.

- *2023-2025 Costed Reclamation Plan for the Tarkwa Gold Mine, 19 April 2024, SRK.*

This includes Section 15.1 Standardised Reclamation Cost Estimator, Table 15-1 Estimation of Closure Costs.

The operation reviews and updates the cost estimate every three years and when revisions to the Plan are made that affect cyanide related decommissioning activities.

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 that includes the following.

ABSA Bank Ghana Limited Payment Guarantee. This is detailed in a letter from the bank to the Ghana EPA. The guarantee expires in 30 September 2025 and is renewed annually with the auditors observing the 2024 letter.

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.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 6.1**

☐ not in compliance with

Summarise the basis for the findings/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.

The operation has developed procedures describing how cyanide related tasks such as unloading, mixing plant operations, entry into confined spaces, and equipment decontamination prior to maintenance should be conducted to minimise worker exposure.

The auditors observed the following.

- *Offloading & Storage of Sodium Cyanide from Sea Container, TGM 4.60.012 PR, 16 May 2024.*
- *Sodium Cyanide Mixing Start Up, TGM 4.60.005 PR, 16 May 2024.*
- *Draining Sodium Cyanide Mixing Tank, TGM 4.60.017 PR, 25 May 2024.*
- *Flushing and Performing Work on the Cyanide Transfer/Delivery Lines, TGM 4.60.018 PR, 25 May 2024.*
- *Cyanide PPE Decontamination and Storage, TGM 4.0.017 PR, 29 August 2024.*
- *Decontamination of Cyanide Equipment, TGM 4.0.010 PR, 20 August 2024.*
- *Emptying & Cleaning of a CIL Tank, TGM 4.40.005 PR, 24 August* 2024 (this includes entry into confined spaces).
- *Tailings Storage Facility (TSF) Delivery Line Failure, TGM 4.90.001 PR, 14 June 2024.*

The procedures require, where necessary, the use of personal protective equipment and address pre-work inspections.

Pre-work inspections are included in the mini-risk assessment that is required before work starts, where there is a procedure for undertaking the work. This is the Take 5 Risk Assessment for Routine Tasks including identifying hazards and implementing controls. The Work Place Risk Assessment and Control (WRAC) is undertaken where it is not a routine operation and a more detailed risk assessment is required.

The operation solicits and actively considers worker input in developing and evaluating health and safety procedures. Procedures are updated every 3 years or if something significant changes. The relevant supervisor will discuss the procedure with the team undertaking the work and get their comments. The comments are then passed on to the Senior Training Officer. The Senior Training Officer is responsible for reminding supervisors when procedures are due for updating and to receive all the updates and collate it into an updated version. Employees can also provide input into procedures when they receive training on a specific procedure. Refresher training is provided after each review of a procedure.

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.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 6.2**

☐ not in compliance with

Summarise the basis for the findings/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 the appropriate pH for limiting the evolution of HCN gas during mixing and production activities. *Sodium Cyanide Mixing Start Up, TGM 4.60.005 PR, 16 May 2024,* specifies that the pH >10.5.

The pH in the Leach Tanks is measured in the first leach tank (Common Tank) with a continuous monitor and by manual titration three times per shift. The set point for the pH is 10.5

This is also specified in the following procedures

- *CIL Train 1 Circuit Start Up, TGM 4.40.001 PR, 24 August 2024.*
- *CIL Train 2 Circuit Start Up, TGM 4.40.003 PR, 24 August 2024.*

The operation has identified areas and activities where workers may be exposed to hydrogen cyanide gas or cyanide dust in excess of 10 parts per million (ppm) (11 mg/m3) on an instantaneous basis and 4.7 parts per million (ppm) 5 mg/m3) continuously over an 8-hour period, as cyanide and require use of appropriate personal protective equipment in these areas or when performing these activities.

The operation uses ambient monitoring devices at locations that have been identified as cyanide hotspots. This includes on top of the Leach Tanks, the Cyanide Storage Tank at the CIL, the Cyanide Mixing Tank at the external reagent area, and the ILR.

In addition, personal monitors are used e.g. during the mixing operation and during the cleaning of the Leach Tanks bund. These were observed during the site visit. The alarms on all of the monitors are set at 4.7 for first alarm whereby the operator should cease activities and leave the area. The second alarm is set at 10 ppm and gives rise to instant evacuation. This is detailed on the notice boards in these areas and from personal communication.

Hotspot survey were undertaken on 10 February 2023, 08 July 2024 and 9 March 2025, that tested HCN levels at the following locations; mixing tank in the external reagent area, storage tank in the CIL area, common leach tank, carbon safety screen, carbon recovery screen, tailing hopper, swimming pool, and ILR. The highest level recorded was 5.1 ppm HCN gas at the ILR on 19 February 2023. The surveys are undertaken twice a year.

The facility uses monitoring devices in process areas and for activities involving the management of cyanide to confirm that workers are not exposed to hydrogen cyanide gas or cyanide dust exceeding 10 parts per million (ppm) on an instantaneous basis and 4.7 parts per million (ppm) continuously over an 8-hour period, as cyanide.

The operation uses fixed ambient monitoring devices at locations that have been identified as cyanide hotspots. This includes at the top of the common tank adjacent to the dosing point, tailings hoppers 1 and 2, cyanide mixing tank, cyanide storage tank, and ILR. In addition, personal monitors are used during certain activities e.g. during the mixing operation and during the cleaning of the Leach Tanks bund. These were observed during the site visit.

Hydrogen cyanide monitoring equipment is maintained, tested and calibrated as directed by the manufacturer, and records are retained for at least three years. The personal hydrogen cyanide gas monitors (Pac 7000) are tested and calibrated on a 6 monthly basis. The fixed hydrogen cyanide gas monitors (Polytron 7000) are tested and calibrated every 12 months.

Warning signs were observed showing that eating, drinking, smoking, and open flames are not allowed and that the appropriate PPE should be worn at the following places; the cyanide mixing facility at the external reagent area, the cyanide storage tank in the CIL Plant, the top of the Leach Tanks at the CIL Plant, and the ILR.

The TSF has signs showing the PPE that needs to be worn, that swimming and drinking is not allowed. The public are not allowed into the area of the TSF and all employees are trained that tailings contain cyanide and eating and drinking are only allowed in designated areas.

High strength cyanide solution is dyed for clear identification. Dye is added during the mixing process when the mixing tank is topped up with water. This is specified in the following procedure.

- *Sodium Cyanide Mixing Start Up, TGM 4.60.005 PR, 16 May 2024.*

Showers, low-pressure eye wash stations and dry powder or non-acidic sodium bi-carbonate fire extinguishers are located at strategic locations throughout the operation where cyanide is used. Emergency showers with integrated low pressure eye washes are located at the mixing facility in the external reagent area, the cyanide storage tanks for the CIL Plant, on top of the Leach Tanks at the CIL Plant and at the dosing point for the ILR. Dry powder fire extinguishers were also observed at all these locations.

Fire extinguishers are checked on a monthly basis and recorded. The monthly checks are recorded on the fire extinguishers. Fire Extinguishers have an annual service by the Ghana National Fire Service.

The reagent strength cyanide mixing and storage tanks and associated piping are coloured purple to demonstrate that they contain cyanide. The piping is also labelled 'Cyanide' and the direction of flow indicated.

The pipelines containing tailings from the Tailings Hopper at the CIL Plant to the TSF are labelled as 'Tails Pipe' with the direction of flow. This includes all of the pipelines within the Plant containing lower strength cyanide solution. Employees are trained to understand that “Tails” / “Tailings” contain cyanide.

Goldfields Safety Data Sheets (cyanide and carmosine (red dye)), First Aid Procedure and other informational materials on cyanide safety is in the language of the workforce (English) and available in areas where cyanide is managed i.e. external reagent area and CIL area. English is the official language on the Mine.

Procedures are in place and being implemented to investigate and evaluate cyanide exposure incidents to determine if the operation's programs and procedures to protect worker health and safety, and to respond to cyanide exposures, are adequate or in need of being revised. There have been no incidents involving an employee related to cyanide since the last recertification audit.

Incident Management Procedure HSMP 7.2 PR, 4 June 2024. Section 5.5 Incident Investigation details who is responsible for undertaking the investigation. The Head of Department (HOD) will only close the investigation if they are satisfied that the cause has been identified.

The incident investigation form included in the procedure requires the following detail:

- Incident Details,
- Incident Summary,
- Investigation Vision,
- Investigation Team,
- Executive Summary,
- Context and Sequence of Events,
- Post Incident Response,
- Photos,
- Root Cause Analysis,
- Barrier Analysis of Failed Established Controls,
- Human Behaviour Analysis and Six Whys,
- Reasons for Risk Taking,
- Conclusion,
- Corrective Actions, and
- Sign off by the relevant supervisor and HOD.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 6.3**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

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

The operation has water, oxygen, a resuscitator, antidote kits and a radio, telephone, alarm system or other means of communications or emergency notification readily available for use at cyanide unloading, storage and mixing locations and elsewhere in the Plant. Radios and cell phones are the primarily means of communication.

The operation has water, oxygen, radio and antidote (Tripac-Cyano) in the emergency first aid stations at the following locations: cyanide storage facility for the CIL Plant, the top of the Leach Tanks, and the external reagent area containing the cyanide mixing facility

These locations also include Man Down alarms and alarmed emergency showers. Oxygen and water are available in the form of Life OxygenPac ,which includes a resuscitator, and emergency showers respectively at the TSF. The Plant and Mine personnel also have radios for communication.

The operation inspects its first aid equipment regularly to ensure that it is available when needed, and that materials such as cyanide antidotes are stored and/or tested as directed by their manufacturer and replaced on a schedule to ensure that they will be effective when needed.

The operation has developed specific written emergency response plans and procedures to respond to all types of cyanide exposures including including ingestion, inhalation, and absorption through the skin and eyes.

The auditors observed the following:

- *Cyanide Emergency Response Action Plan*. This d,etails the first aid to be provided in the case of cyanide exposure and is posted on the relevant notice boards.
- *Cyanide Emergency Response Plan, TGM 4 002 PR, 29 August 2024*. This details the first aid response in Section 4.0.
- *Sodium Cyanide (NaCN) First Aid Procedure 4.0 003 PR, 20 August 2024* includes details of the first aid procedure and how workers are transported to the on-site medical facility.

The operation has its own on-site capability to provide first aid and medical assistance to workers exposed to cyanide.

The Plant has individuals on each shift trained in first aid. In addition, they have an Emergency Response Team that includes seven people trained in first aid plus a paramedic for each shift (2 x 12 hour shifts).

The Emergency Response Team will respond to any cyanide emergency and will transport the patient by ambulance to the on-site hospital. The on-site hospital is operated by Euracare under contract to Gold Fields.

The operation has developed procedures to transport workers exposed to cyanide to locally available qualified off-site medical facilities, which includes the following.

The Gold Mine has a fully equipped on-site hospital, to which all patients suffering from cyanide exposures are transported and treated. If they subsequently require specialist treatment they will be transported to the necessary hospital in Accra, Ghana or if necessary to an international facility.

- *Sodium Cyanide (NaCN) First Aid Procedure 4.0 003 PR, 20 August 2024* includes details of how workers are transported to the on-site medical facility.

The operation has informed the relevant medical facilities of the potential need to treat patients for cyanide exposure, and the operation is assured that the medical facility has adequate, qualified staff, equipment and expertise to respond to cyanide exposures.

The Mine has an on-site medical facility that are aware of the potential need to treat patients for cyanide exposure as confirmed by the auditors during the site assessment. If the patient subsequently needs to be evacuated to another hospital for further treatment this is detailed in the *Medical Emergency Response Plan* and *Sodium Cyanide (NaCN) First Aid Procedure*

The on-site hospital was recently involved in a full cyanide exposure drill.

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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.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 7.1**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 7.1; prepare detailed emergency response plans for potential cyanide releases. The operation developed Emergency Response Plans to address potential accidental releases of cyanide and cyanide exposure incidents. These include the following.

The operation has developed specific written emergency response plans and procedures to respond to all types of cyanide exposures. The auditors observed the following:

- *Cyanide Emergency Response Plan (CERP), TGM 4 002 PR, 30 October 2024*. This is a Plant specific emergency response plan.
- *Emergency Preparedness and Response Plan (EPRP), HSMP 5.5 PR, 4 June 2024*. This is a mine wide emergency response plan.

These procedures address the potential releases of cyanide that may occur or require a response.

The CERP considers the following potential failure scenarios appropriate for its site specific environmental and operating circumstances.

a) Section 6.3.4 Catastrophic release of cyanide gas.

b) Section 6.3.2 Transportation incidents. In addition, the operation has a copy of the *Movis Logitics Limited Emergency Response Plan- Vehrad Transport Emergency Response Plan, and Stellar Logistics Emergency Response Plan* to ensure co-ordination of any emergency response.

c) Section 6.3.3 Release during unloading and mixing of cyanide and through the following procedures:

- *Handling Dry Sodium Cyanide Spill (Sea Containers) TGM 4.60.001 PR, 16 May 2024.*

- *Handling Dry Sodium Cyanide Spill (Split Bag) TGM 4.60.002 PR, 16 May 2024.*
- *Handling Cyanide Solution Spill, TGM 4.60.002 PR, 16 May 2024.*

d) Section 6.3.7 Release of Cyanide during Fire and Explosions.

e) Section 6.3.1. Tank, Pipes and Valve Ruptures, and Section 6.3.10 TSF Line Failure.

f) Section 6.3.5 Overtopping of Pond and Impoundments.

g) Section 6.3.10 Power Outages and Pump Failures.

h) Section 6.3.6 Uncontrolled Seepages.

i) Section 6.3.11 Failure of Detoxification Facilities. This details the addition of chemicals in the Tailings Tank to reduce the levels of cyanide in the tailings.

j) Section 6.3.8 Failure of TSF Embankment Wall (TSF Failure).

Planning for response to transportation-related emergencies has considered the transportation route, physical and chemical form of the cyanide, method of transport, the condition of the road, and the design of the transport vehicle. Transport related emergencies outside the mine are the responsibility of the transport company. The transportation companies have emergency response plans and route risk assessments as part of the ICMC certification. These have considered the transportation route, physical and chemical form of the cyanide, method of transport (e.g., rail, truck), the condition of the road or railway, and the design of the transport vehicle.

The following were observed by the auditors:

- *CERP Section 6.3.2 Transportation incidents*.

In addition, the operation has a copy of the *Movis Logitics Limited Emergency Response Plan- Vehrad Transport Emergency Response Plan, and Stellar Logistics Emergency Response Plan* to ensure co-ordination of any emergency response.

The emergency response plans include the following detailed in the relevant sections.

k) specific response actions, as appropriate for the anticipated emergency situations, such as clearing site personnel and potentially affected communities from the area of exposure.

- *EPRP Section 7.0 Emergency Response Initial Actions.*
- *CERP Section 3.2 Plant Supervisors' Actions*, including the evacuation of personnel.
- *Procedure for notifying potentially affected communities, TGM 10.10.002 PR.*

h) Use of cyanide antidotes and first aid measures for cyanide exposure.

- *CERP Section 4.0 Human Cyanide Exposure – First Aid Response*. The use of antidote is limited to trained medical staff.
- *Sodium Cyanide (NaCN) First Aid Procedure 4.0 003 PR, 20 August 2024* includes details of the first aid procedure and how workers are transported to the on-site medical facility.

i) Control of releases at their source is included in the following procedures.

- *EPRP Section 12.0 Emergency Procedures – Spills* states that if safe to do so close off the source of the spill.
- *Handling Cyanide Solution Spill, TGM 4.60.002 PR, 16 May 2024.*
- *Tailings Storage Facility (TSF) Delivery Line Failure, TGM 4.90.001 PR, 14 June 2024.*

j) containment, assessment, and mitigation of releases is included in the following procedures.

- Handling Cyanide Solution Spill, TGM 4.60.002 PR, 16 May 2024.
- Tailings Storage Facility (TSF) Delivery Line Failure, TGM 4.90.001 PR, 14 June 2024.

Future prevention of releases is assessed as part of the incident investigation.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 7.2**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 7.2; involve site personnel and stakeholders in the planning process.

The operation has involved its workforce and stakeholders in the cyanide emergency response planning.

The workforce is included in the emergency response planning process through the daily toolbox talks, monthly health and safety meetings, and through the testing of the Emergency Response Plan by the mock drills.

The operation has made potentially affected communities aware of the nature of the risks associated with accidental cyanide releases and consulted with them directly, or through community representatives, regarding appropriate communications and response.

Tarkwa Mine Community Consultative Committee Meeting (TMCCCM) meets quarterly, with representatives from the communities including; chiefs, elders, assembly members, municipal representatives, health department, education, police, fire brigade, and community development.

The operation has involved local response agencies such as medical facilities in the cyanide emergency planning and response process.

The main response agencies are the Mine Emergency Response Team, and the on-site hospital. These have all been involved in the emergency planning and response process. Local outside responders are involved in the emergency planning process through the TMCCCM with regards to emergencies that could affect the area and communities outside the mine property such as the failure of the TSF.

The emergency response teams and hospital are involved in the mock drills

The operation engages in consultation and communication with stakeholders to keep the Emergency Response Plan current. The most recent internal communication was through the mock drill which involved the Emergency Response Team, the on-site hospital, and the staff of the CIL Plant.

Communication with the local communities and Tarkwa town emergency response services is through the TMCCCM meetings and the Joint TSF Failure and Rescue Simulation Drill.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 7.3**

☐ not in compliance with

Summarise the basis for the findings/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 Emergency Response Plan includes cyanide related elements as detailed below

a) Designate primary and alternate emergency response co-ordinators who have explicit authority to commit the resources necessary to implement the Plan?

Cyanide Emergency Response Plan, Section 2.0 Cyanide Emergency Response Team defines the response co-ordinators (Emergency Controller and Site Controller) roles and responsibilities. The Emergency Controller can "request the resources and people as dictated by the situation".

b) Require appropriate training for emergency responders?

All cyanide unloading, mixing, production and maintenance workers are trained in decontamination and first aid procedures as part of the initial Cyanide Induction for mine workers, and during the Refresher Training for individuals working in the Plant.

The auditors observed the Cyanide Refresher Training presentation (presented by Metallurgy Trainer). A test is written after completion of the cyanide induction training. An 80% pass mark is required.

People working in the Plant take part in mock drills to improve their response skills. The main responders are the Emergency Response Team (7 per shift) who are trained in the following: Cyanide ER (Mandown), Sodium Cyanide First Aid, HCN Gas Detection using Draeger Detector, Sigma 2 (SCBA) Donning, Cyanide Fire Emergency, Handling a Stretcher, Oxy-Pc Usage.

c) Include call-out procedures and 24-hour contact information for the co-ordinators and response team members?

T*he Emergency Preparedness and Response Plan* Section 7.0 Emergency Response Initial Actions includes details of the communication to be undertaken in the event of an emergency. In addition, the Emergency Contact List is attached in Appendix 3.

The auditors observed a list of the individuals who form part of the Emergency Response Team within the Plant together with relevant contact numbers on various notice boards.

d) Specify the duties and responsibilities of the co-ordinators and team members?

The *Cyanide Emergency Response Plan*, Section 2.0 Cyanide Emergency Response Team defines the response co-ordinators (Emergency Controller and Site Controller) roles and responsibilities. Section 3.0 Responding to Potential Releases of Cyanide specifies the Plant Supervisor's responsibilities.

The Emergency Preparedness and Response Plan, details the roles and responsibilities of the Emergency Management Team i.e. the mine wide team.

e) List emergency response equipment, including personal protection gear, available on-site?

Cyanide Emergency Response Plan, Section 3.3 details the contents of the Emergency Response Trailer located are the external reagent area. In addition, the First Aid Cabinets contain a list of their contents on their outside.

f) Include procedures to inspect emergency response equipment to ensure its availability?

The Emergency Response Trailer is inspected on a weekly basis. Inspection of hospital cyanide emergency equipment is inspected by the hospital staff on a daily basis. CIL Tanks Checklist., inspects the following on a daily basis; fixed CN monitors, man down alarms, safety showers, fire extinguishers, first aid room, oxypac and antidote.

g) Describe the role of external responders, medical facilities and communities in the emergency response procedures?

The local communities and Tarkwa town emergency response services do not have designated responsibilities in the Mine Emergency Response Plan due to the distance from the Mine except when communities are affected such as in the event of a TSF failure with external responders fulfilling their normal roles within the affected community.

The local communities and Tarkwa town emergency response services do not have designated responsibilities in the Mine Emergency Response Plan due to their distance from the Mine except when communities are affected such as in the event of a TSF failure.

Communication with the local communities and Tarkwa town emergency response services is through the TMCCCM meetings and the Joint TSF Failure and Rescue Simulation Drill.

Mock emergency drills within the mine are conducted every 6 months to test response procedures for various exposure scenarios.

Standard of practice 7.4: Develop procedure for internal and external emergency notification and reporting.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 7.4**

☐ not in compliance with

Summarise the basis for the findings/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 *Emergency Preparedness and Response Plan,* Section 9.0 Communication includes the requirements for internal and external communication e.g. regulatory authorities, as well as communication with the Plant emergency response team, the Mine emergency response team, the on-site hospital, and the mine fire brigade. This also details the procedure for contacting the media by the Community Affairs Manager.

The *Emergency Preparedness and Response Plan*, Section 9.2 External Communications states that emergencies posing a safety or health risk to local communities will be communicated through the Municipal Security Council via the Municipal Chief Executive or the Municipal Coordinating Director.

Procedure for Notifying Potentially Affected Communities, 4 October 2023 states that the Community Affairs Manager will be informed of any incidents. Following the relevant approval the Manager will inform community members by announcements at the community information centres.

The *Cyanide Emergency Response Plan,* Section 7.0 Communication of Significant Cyanide Incident stipulates the requirement to communicate a significant cyanide incident to the ICMI. It is required that the incident is initially communicated within 24 hrs of the incident occurrence and in accordance with the requirements of the site's Incident Management Procedure. Further details on the root cause, health, safety and environmental impacts, and any 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 the findings/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 spill procedures referred to in the emergency response plans describe specific remediation measures as appropriate for the likely cyanide release scenarios as detailed below.

a) Recovery or neutralisation of solutions or solids.

The relevant procedures are:

- *Handling Dry Sodium Cyanide Spill (Sea Containers) TGM 4.60.001 PR, 16 May 2024.*
- *Handling Dry Sodium Cyanide Spill (Split Bag) TGM 4.60.002 PR, 16 May 2024.*
- *Handling Cyanide Solution Spill, TGM 4.60.002 PR, 16 May 2024.*

b) Decontamination of soils or other contaminated media.

The procedures state that following the clean-up of contaminated material, ferrous sulphate is to be used for decontamination. Ferrous sulphate is kept and used in its solid form and stored with the other emergency response equipment.

The CERP states that as a guide 1 kg of ferrous sulphate per 0.9 kg of dry cyanide is required. The test that neutralisation is complete is by the use of starch iodide papers with the white paper turning blue.

c) Management and/or disposal of spill clean-up debris.

Handling Cyanide Solution Spill, TGM 4.60.002 PR, 16 May 2024 states “use shovel or the bucket of the loader to scrape the absorbent material into well labelled air tight containers” and that after the decontamination of the area the contaminated material is disposed of at the TSF or if appropriate to Feeder 004.

d) Provision of an alternate drinking water supply.

Provision of alternate drinking water supply is not required as local surface water is not in proximity to where process solution strength cyanide solution is used, solid cyanide is stored, or the TSF is located.

The Cyanide Emergency Response Plan, TGM 4.0.002 PR, 29 August 2024 Section 5 Neutralisation states “Do not use detoxification chemicals like hypochlorite, hydrogen peroxide and ferrous sulphate to treat spillage into stream or natural ponds”.

The Plan addresses the potential need for environmental monitoring to identify the extent and effects of a cyanide release, and includes sampling methodologies, parameters and, where practical, possible sampling locations.

The CERP states that the Environment Department must be involved in the assessment of any cyanide releases. The Environment Department must monitor the extent of the incident by taking soil and water samples. The protocol for water monitoring is contained in *Water Quality Monitoring and Quality Assurance Program, TGM-ENV-Env-01.*

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

The operation is

☒ **in full compliance with**

☐ **in substantial compliance with Standard of Practice 7.6**

☐ **not in compliance with**

Summarise the basis for the findings/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 Plan for adequacy on a regular basis.

Documented Information Procedure, 4 June 2021 Section 6.13 states that all Health and Safety Management System procedures, work instructions and safe work procedures shall be reviewed three yearly or when required as a result of changes to process, incidents, etc.

- The *Cyanide Emergency Response Plan* is on revision 10
- The *Emergency Preparedness and Response Procedure* is on revision 15

Mock cyanide drills are conducted periodically as part of the Emergency Response Plan evaluation process. Mock emergency drills are conducted every 6 months to test response procedures for various exposure scenarios. The schedule for mock drills in 2024 was observed, which included 4 mock drills with one of them being for cyanide exposure. The schedule for mock drill in 2025 was observed by the auditors. The mock drills undertaken in since the previous recertification audit were not tabletop exercises and involved all of the personnel that may be expected to respond to the type of cyanide incident simulated.

The operation also evaluated the cyanide emergency drills conducted during this ICMC recertification period to determine the adequacy of the operation's response plans and training programs, which were found to be adequate.

Provisions are in place to evaluate and revise the Emergency Response Plan after any cyanide related emergency requiring its implementation.

There have been no cyanide related emergencies requiring the implementation of the Emergency Response Plan.

The *Emergency Preparedness and Response Plan*, Section 5.6 states that the emergency response procedure will be reviewed after every major incident or drill. None of the revisions were due to changes highlighted by mock drills.

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.

The operation is

☒ **in full compliance with**

☐ **in substantial compliance with** **Standard of Practice 8.1**

☐ **not in compliance with**

Summarise the basis for the findings/deficiencies identified.

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

The operation trains all personnel who may encounter cyanide in cyanide hazard recognition.

All employees must attend a Mine and Plant induction at the start of employment and then again after each return from annual leave, which includes Cyanide Awareness Training

Cyanide Refresher Training is a more detailed course that is provided to all Plant personnel. This includes the First Aid Procedure, Emergency Response Plan and decontamination. The auditors observed Cyanide Refresher Training presentation (presented by Metallurgy Trainer). A test is written after completion of the cyanide induction training. An 80% pass mark is required. Cyanide refresher training questionnaires were observed by the auditors.

The required training is divided into the following:

- Cyanide Review Training,
- Plant Induction,
- Plant Reagent Safety at the Workplace (various modules),
- Safe Work Practices (various modules),
- Operational Control Requirements (various modules),
- Minerals and Mining regulations (various modules),
- Mobile Equipment Training (various modules),
- CIL Plant Specific Training.

This training adequately addresses cyanide hazards, such as the cyanide materials present at the operation, the health effects of cyanide, and the symptoms of cyanide exposure.

The auditors observed the Training Matrix for the Metallurgy Department which indicates the training required for each position.

Cyanide hazard recognition refresher training is conducted periodically. Employees that return from annual leave are required to attend the two day mine induction followed by the Processing Plant induction prior to commencing work. The Metallurgical Senior Training Officer keeps a list of all employees working at the Plant and TSF with the date of last training received and sends out reminders to people. If the induction has expired access to the Plant is denied until the refresher training is undertaken.

The MET Training Records CIL spreadsheet contains the person's name, position, section and dates of training completed. This is divided into one Excel sheet per department.

The sheet contains the date when the next Plant Induction is due, with the date turning red when it is overdue and yellow when it is almost due.

It was observed that cyanide training records are kept electronically as well as hard copies in the employee files. Cyanide training records are retained for at least 3 years for contractors and permanently for employees. Training records include the tests to determine competency.

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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.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 8.2**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with 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.

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.

Procedures applicable to employees working in specific sections have been identified as well as the employees that should receive the specific training. The auditors observed the Metallurgy Training Records, CIL Spreadsheet for the employees working in the reagent section showed that they require training on the following, amongst others.

- - Sodium cyanide mixing start up;
- - Sodium cyanide mixing shut down;
- - Offloading sea container from trucks;
- - Offloading & storage of NaCN from sea container;
- - Loading sea container unto a truck;
- - Offloading & storage of hydrochloric acid;
- - CN transfer- mixing tank to storage tank;
- - Cyanide distribution start up;
- - Cyanide protection control; and
- - Sodium cyanide operational PPE control.

Training is presented to all new employees and when they move to a new section or when procedures are updated.

The training elements necessary for each job involving cyanide management is identified in the training materials. The training elements are detailed in the SOPs which is given to an employee prior to them starting in a new area with an 80 % pass mark.

In addition, PTOs are undertaken by the Supervisors on individuals for the various procedures. This is undertaken on an as required basis.

Appropriately qualified personnel provide task training related to cyanide management activities. Benedicta Asafo-Adjei the Metallurgical Senior Training Officer undertakes the majority of the formal training. Her training records were observed and included the

following: Benedicta Asafo-Adjei - Senior Processing Supervisor's Certificate of Competency date April 2017, Training the Trainer dated 19 May 2014, Metallurgical Plant Operations and Control dated 16 Dec 2013, First Aid at Work 12 July 2013, Pac 7000 dated 21 May 2013, Effective Supervision for Efficiency and Performance dated 20 Feb 2013, Gold Extraction Techniques 21 Dec 2012, Safety for Supervisors Training Course dated 21 Aug 2012, BSc Mineral Engineering 11 June 2010, Minerals Commission Plant/ Processing/ Metallurgical Superintendent Certificate of Competency. In addition, she has 12 years mining experience.

Workers are trained prior to working with cyanide. All employees must attend an induction at start of employment and then again after return from annual leave. The auditors observed the Cyanide Refresher Training presentation (presented by Metallurgy Trainer). A test is written after completion of the cyanide induction training. An 80% pass mark is required. Examples of the test were observed.

Procedures applicable to employees working in specific sections have been identified as well as the employees that should receive the specific training

Refresher training on cyanide management is provided to ensure that employees continue to perform their jobs in a safe and environmentally protective manner.

Induction training is refreshed on a regular basis after annual leave. Training on specific procedures is undertaken when any of the procedures are altered. PTOs are undertaken on a regular basis as and when required or if there is an issue with a person's performance. Induction training records and PTO records were observed as detailed previously.

The operation evaluates the effectiveness of cyanide training by testing, observation or other means. The Induction Training is followed by a test where a pass mark of 80% is required. There are also tests associated with the training on specific procedures. The pass mark for these is also 80%.

In addition, PTOs are undertaken on a regular basis by supervisors. PTO records were observed as detailed previously.

Records are retained throughout an individual's employment documenting the training they receive. The records include the names of the employee and the trainer, the date of training, the topics covered, and if the employee demonstrated and understanding of the training materials.

Standard of practice 8.3: Train appropriate workers and personnel to respond to worker exposure and environmental releases of cyanide.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 8.3**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 8.3; 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 released. Emergency response training is undertaken as part of the induction training and the annual refresher training. Employees also take part in mock drills.

Site cyanide response personnel, including unloading, mixing, production and maintenance workers, and the Mine Emergency Response Team are trained in the Emergency Response Plan including decontamination and first aid procedures, as part of the initial cyanide induction and refresher. They take part in routine drills to test and improve their response skills. The Emergency Response Team are also trained in the use of the necessary response equipment.

Emergency Response Co-ordinators and members of the Emergency Response Team are trained in the procedures included in the Emergency Response Plan regarding cyanide, including the use of necessary response equipment.

The main responders are the Emergency Response Team (7 per shift) who undertake additional training including cyanide induction and refresher training and first aid certificates. The emergency medical services are located at the on-site hospital and they take part in the mock drills on site. The local fire brigade and police are informed through the TMCCCM meetings and the Joint TSF Failure and Rescue Simulation Drill in 2024.

Refresher training for response to cyanide exposures and releases is conducted regularly. Employees that return from annual leave are required to attend the Processing Plant induction programme prior to commencing work and after attending the two day mine induction. A form, provided by HR, is given to the employee to have signed off once the refresher training has been completed. The Metallurgical Senior Training Officer keeps a list of all employees working at the Plant and TSF with the date of last training received.

The Plant Emergency Response Team are trained annually as part of their refresher in the response to cyanide exposures and releases. Records are retained documenting the cyanide induction and refresher training including the emergency response training. This includes the names of the employee and the trainer, the date of training, the topics covered, and how the employee demonstrated an understanding of the training materials as observed by the auditors.

Tarkwa Gold Mine
Name of Facility

Signature of Lead Auditor

September 2025
Date

Records are retained for at least 3 years for contractors and for the duration of employment for permanent employees. This was verified during the review of the training records.

Principle 9 – Dialogue and Disclosure

Engage in Public Consultation and Disclosure.

Standard of practice 9.1: Promote dialogue with stakeholders regarding cyanide management and responsibility address identified concerns.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 9.1**

☐ not in compliance with

Summarise the basis for the findings/deficiencies identified.

The operation is in full compliance with Standard of Practice 9.1; provide stakeholders with the opportunity to communicate issues of concern.

The operation provides the opportunity for stakeholders to communicate issues of concern regarding the management of cyanide.

There is a Tarkwa Mine Community Consultative Committee Meeting (TMCCCM), which is undertaken quarterly, with local chiefs, elders, Assembly Representatives, Women's Representatives, Representatives from the 12 local communities, Municipal Representatives, Health Department, Education Department, Community Development, police and fire brigade.

The auditors observed the following minutes including general discussion on issues topical to the group, questions, concerns, and suggestions. These meetings have included a presentation on cyanide awareness, a presentation on the grievance mechanism, the emergency contact list, and details on Global Industry Standard on Tailings Management (GISTM).

Feedback from the TMCCCM is taken to larger community meetings undertaken in each of the 12 communities twice a year.

The Community Relations officers reside in the local community and are therefore accessible to community. Any complaints are documented in the complaints register. Notices and information are provided at the TMCCCM

The register contains the date, time, name of complainant, community the person is from, complaint, action taken/to be taken/, person responsible. The public can make complaints by phone or in person at the Community Relations Office at the mine.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 9.2**

☐ not in compliance with

Summarise the basis for the findings/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.

The operation has developed written descriptions of how their activities are conducted and how cyanide is managed. These descriptions are available to communities and other stakeholders. The Cyanide Awareness Training presentation is printed out and provided on notice boards in the communities in the local language.

The auditors observed photographs of the cyanide information. The information is provided in written and pictorial form on basic information regarding cyanide.

The operation has disseminated information on cyanide in verbal form in the local language where a significant percentage of the local population is illiterate. The presentations given at the meetings detailed above in 9.1.1 were given verbally in the local language of Twi to allow for any persons who were illiterate. In addition, there are radio presentations about the Mine and the use of cyanide. Three presentations were undertaken in 2024 in the local language.

The operation makes information publicly available on confirmed cyanide release or exposure incidents including the following.

- Cyanide exposure resulting in hospitalisation or fatality.
- Cyanide releases off the mine site requiring response or remediation.
- Cyanide releases on or off the mine site resulting in significant adverse effects to health or the environment.
- Cyanide releases on or off the mine site requiring reporting under applicable regulations.
- Releases that are or that cause applicable limits for cyanide to be exceeded.

No cyanide related incidents have occurred since the last recertification audit.

The operation makes information publicly available on confirmed cyanide releases or exposure incidents. Tarkwa Gold Mine reports incidents in accordance with the Gold Fields Global Reporting Initiative (GRI) system. It is required that all incidents are reported on the online GRI Portal. Incidents reported to the GRI Portal are featured in the annual group environmental performance information published in the sustainability section on the company's website. The information provided on the website is at a high-level.

The Gold Fields website was observed stating that there had been zero serious environmental incidents in 2023 and 2024. This states that the majority of the level 2 environmental incidents (i.e. with a small but measurable impact on the environment) were related to the loss of containment. No larger incidents were recorded.

Exposure and release incidents meeting the legal requirements for reporting would have to be reported within 24 hours to the Ghana Environmental Protection Agency (EPA) and Ghana Minerals Commission. Such reporting will require a high level of detail, differentiating between the type of cyanide release and exposure as listed in a) to e) of this question. The Ghana EPA and Ghana Minerals Commission will make publicly available information reported to them on the types of incidents listed.

Cyanide related incidents, as listed in a) to e) of this question, will be made publicly available by Tarkwa Gold Mine during meetings with stakeholders such at the Community Consultative Committee Meetings described in 9.1 or via special communication through the Community Relations Office.

Tarkwa Gold Mine has not experienced any cyanide releases or exposures as listed under items a) to e) of this question in the period since the last recertification audit.

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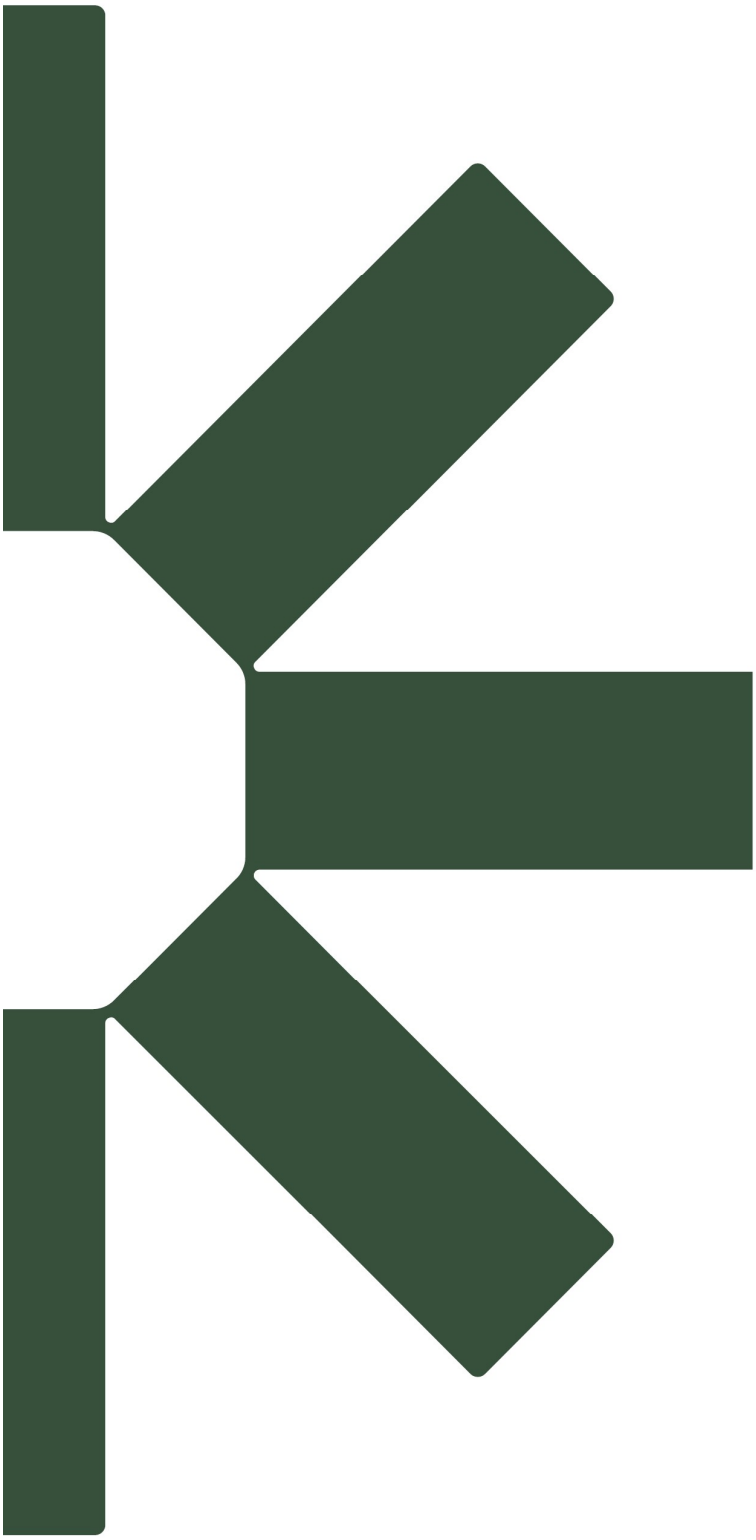

Making Sustainability Happen