

***INTERNATIONAL CYANIDE
MANAGEMENT INSTITUTE***

***Cyanide Code Compliance Audit
Gold Mining Operations***

***Summary Recertification
Audit Report***

***Harmony Gold Mines Limited
Number One Gold Plant
South Africa***

15th – 19^h January 2024

***For the
International Cyanide Management Institute***



Name of Operation: Harmony One Plant (FG 1 Plant)

Name of Operation Owner: Harmony Gold Mines Limited

Name of Operation Operator: Harmony Gold Mines Limited

Name of Responsible Manager: Thabo Chuene, Plant Manager

Address: PO Box 1, Glen Harmony 9435

Country: South Africa

Telephone: +27 57 904 3000 / +27 78 578 0421

E-Mail: Thabo.Chuene@Harmony.co.za

Process Description and location

Harmony FG 1 Gold Plant is located near the Bambanani shaft, on the southern edge of the City of Welkom, in the Free State Province of South Africa. It is the highest producing gold plant owned and operated by Harmony Gold. Harmony FG 1 (No 1 Plant) Gold Plant currently processes underground ore from multiple shafts, as well as ore from several surface sources (i.e. waste rock dumps). The plant uses liquid sodium cyanide for gold extraction, supplied via bulk tanker from Sasol South Africa (Pty) Limited (Sasol), an ICMI (International Cyanide Management Institute) -certified cyanide producer in South Africa. The plant was built in 1986, and the milling, leaching and carbon-in-pulp technology reflects the technology which was current at the time. Plant design capacity is 390,000 tpm (tonnes per month), steady state.

The operations at the Harmony FG 1 Gold Plant consist of:- an ore receiving bay (where ore that is railed in is brought to the plant from the various ore sources); a milling plant (using six run-of-mine (ROM) mills in parallel to grind the ore to the required sizing); thickeners to upgrade the density of the slurry to the density required for leaching and adsorption; three parallel leaching trains, followed by three parallel adsorption trains (where the gold is adsorbed onto activated carbon granules); Carbon elution and regeneration facilities; Gold recovery (zinc precipitation) and smelting operations.

Ore Reception:

The use of parallel processing starts at the ore receive bin, where there are two unloading stations for the railcars that bring the ore in from the various shafts and rock dumps. A unique feature of the plant is the Ore Reception facility, which has been designed to eliminate dead storage space, a serious constraint in railway ore storage bins. Ore is transported by rail to the plant. The railway hoppers discharge individually into one of the two concrete, rail-lined inverted cones, 12m (metres) in diameter and 8m deep. The apex of the cone is 57°. The ore is rapidly withdrawn from the apex of the cone via a shuttle belt feed conveyor feeding onto a main silo feed conveyor. The twelve ore storage silos are constructed from concrete and are also rail-lined. Each silo has a live storage of approximately 3 000 tons. Ore is discharged onto the mill feed conveyor



via a pneumatically operated Langlaagte chute. When filled to full capacity, the twelve ore silos provide approximately 60 hours storage for the six ROM mills.

There are six parallel and independent milling lines with each one having a conveyor running underneath 2 silos (A and B) and taking the ore up into one of the six ROM mills. Generally, ore is drawn only from one of the two silos for each mill whilst the other is being filled with ore. Hence, one silo is discharging onto the mill feed belt and the other refilled.

Milling:

The ore is taken up the slow moving conveyers from underneath the silos and discharged directly into the feed hopper for the ROM mills. Fully autogenous (FAG) milling is a milling process in which the entire ROM ore stream is fed directly into the mills. The grinding media is generated within the mill from suitably sized pieces of ROM ore itself, supplemented by waste rock dump material. The feed rate to the mills is between 90 and a 120t/h (tons per hour).

The milling circuit consists of six single stage ROM mills that are controlled on maximum power, utilizing programmable logic controllers (PLCs). Variations in mill load are measured by load cells situated under the outlet trunnion bearings. Each ROM mill is 4.9m diameter by 10m long and powered by 3.3MW (megawatt) motors and grinds the ore to between 68 and 83% minus 75µm. The operation does not mill in cyanide and solutions in the circuit were tested and found to be below 0.5 mg/l WAD (Weak Acid Dissociable) cyanide. Thus, the milling circuit is not deemed a cyanide facility.

For control purposes the mill feed belts and the mill discharge pumps both have variable speed drives. Each mill is in closed circuit with a 1200mm primary cyclone with mass flow measurement on the feed. The primary cyclone overflow is screened on a 600µm linear screen for the removal of coarse woodchips and tramp steel. This has the purpose of preventing gold losses and carbon contamination in the downstream CIP (Carbon in Pulp) circuit. Cyclone overflow, which has a low density, is pumped out to the thickeners. The current cyclone overflow size is 83% at -75µm.

Thickening:

Calcium Oxide (lime – CaO) is added to the thickeners as slaked lime with levels of CaO being controlled at between 0.014 and 0.016% CaO. The lime maintains a protective level of alkalinity in the leach section to prevent the generation of poisonous HCN (hydrogen cyanide) gas in the process. Thickening is carried out in six 60m diameter, cable torque thickeners. Flocculent is used to assist the settling rate and is added at the rate of approximately 1 to 3 g/t (grams per ton).

Each thickener is equipped with a fixed and variable speed underflow pump. The variable speed pump is used for transferring the thickened slime (± 53% solids) to the leach circuit. The thickener underflow density is controlled by varying the flow to the leach circuit. The fixed speed pump is used in an emergency and for recycling or emptying of a thickener for maintenance purposes. The thickener overflow gravitates to two mill return tanks for re-use in the mill. There are six thickeners operating in three parallel trains, with the two thickeners in each train also working in parallel. The discharge from a pair of mills is combined and taken out to two thickeners that increase the density of the discharge slurry from the mills.



Leach:

The leach circuit consists of three streams, each with nine 800m³ mechanically agitated draught tube circular tanks. The nominal residence time of the pulp per stream is approximately 27 hours. The feed to leach is screened for woodchips, using three Mintek circulating tanks fitted with 800µm aperture mesh screens. The concentrated woodchips are bled from the Mintek tank over a vibrating woodchip screen to dewater prior to removal of woodchips to a stockpile.

Air is injected under the draught tube impeller for oxygen distribution to the pulp. Liquid sodium cyanide is automatically added to the leach reception tank, with the initial level of the sodium cyanide being controlled by TAC1000 (proprietary name) online automatic samples between 0.020% and 0.022% NaCN, to dissolve the gold. The underflow from the thickeners is at the appropriate density for leaching and adsorption and is pumped across to one of the three leaching trains. The concept is that should a reduction in output be required then one train can be shut down whilst the other two are running at full capacity, and hence at optimal efficiency.

By the time the slurry reaches the last vessel in the leach train, approximately 75% of the gold has been dissolved.

CIP (Carbon in Pulp):

The slurry then passes to one of the three adsorption trains, each of which has seven 280m³ tanks where it passes through the tanks in counter-flow to the carbon movement, which adsorbs the gold that is in solution. The downwards gravitation of carbon from one tank to the next is prevented by 800 µm Kambalda inter-stage screens. The gold depleted slurry from the seventh tank flows over a vibrating carbon safety screen and is pumped to the residue pachuca. The slurry from the residue pachuca is then sampled by an automatic online WAD cyanide analyser. The majority of residue is pumped to the slimes dams, but a portion was previously pumped to a Backfill plant for the generation of backfill material. The Backfill plant, which is located at the decommissioned Bambanani West shaft site, was decommissioned on the 29th June 2022. The carbon that has been pumped upstream is recovered at the first adsorption tank by pumping the slurry over a vibrating carbon screen. This separated the gold loaded carbon from the slurry, which is then transferred to the carbon holding vessel at the Elution section.

Elution and Regeneration:

The Elution section has three separate elution modules that process the carbon from the three CIP trains. One 1.25m diameter elution column is used in each of the elution trains and the cycle of water/acid washing, first and second strips are all done in the one column by passing the various solutions through the column. The AARL (Anglo American Research Laboratory) process is used at 130°C and 450 kPa (kilopascals). All three elution modules are controlled by means of a PLC which makes the entire process automatic. The four oil heaters (also known as Themopacs) that are used to provide the heat for the elution process, are fired by polyfuel (a diesel equivalent supplied by Sasol) burners which have their fuel provided from a large storage tank mounted outside of the building.

After the carbon has been stripped it is taken through three 9m length regeneration kilns that use electrical resistance heaters mounted around them to provide the heat for regeneration.



Recovery:

The gold rich eluate from the columns is pumped across to the eluate tanks located inside of the smelt house. This is where the gold in solution is recovered by Zinc Precipitation rather than the usual Electro-winning process.

The zinc precipitate is filtered out by rotary vacuum drum filters and then calcined in one of the 9 large ovens at 800°C to oxidise as much of the base metals as possible. Finally, the concentrate is mixed with silica-borax-Manganese flux and smelted into gold bullion in one of three electric arc furnaces at $\pm 1400^{\circ}\text{C}$.

Residue:

The processed slurry (gangue) is then pumped from plant Residue pachuca to the Tailings facilities. Sampling of WAD cyanide, free cyanide, gold, density and grind is conducted prior to the slurry leaving the plant for the TSF (Tailings Storage Facility).



Auditor's Findings

This operation is

in full compliance

in substantial compliance

not in compliance

with the International Cyanide Management Code.

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

Audit Company: Eagle Environmental

Audit Team Leader: Arend Hoogervorst

E-mail: arend@eagleenv.co.za

Names and Signatures of Other Auditors:

Name: Dawid M. L Viljoen
Technical Expert Auditor

Signature



Date: 16/07/2024

Dates of Audit: 15th – 19th January 2024

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

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

Harmony One Gold Plant



17/07/2024

Facility

Signature of Lead Auditor

Date

One Gold Plant

Signature of Lead Auditor

12th July 2024

Auditor's Findings

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

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

X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:

There is a Harmony Group-wide, cyanide supply contract, covering all Harmony Gold Plants, in place with Sasol South Africa (Pty) Ltd (Sasol), as the sole supplier of liquid Sodium Cyanide, delivered by bulk tanker. This supply contract includes Harmony One Gold Plant. Sasol is a signatory to the Cyanide Code and was re-certified as a fully compliant Production Facility with the ICMI (International Cyanide Management Institute) Cyanide Code on 7 March 2022.

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.

X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:



There are only two components in the No 1 Plant cyanide chain of custody, Sasol, the producer, and Tanker Services Food and Chemicals/Imperial Logistics (Tanker Services), the bulk liquid cyanide transporter.

The chain of custody document package relating to a cyanide delivery made to FG 1 Gold on 15 September 2021 was sampled and included the following: -

- a Harmony purchase order dated 24 August 2021,
- a Sasol delivery note and dangerous good declaration dated 14 September 2021,
- a Sasol Delivery Note dated 15 September 2021 and,
- a Tanker Services delivery note dated 15 September 2021.

Also sampled was the Chain of Custody package for a cyanide delivery made to FG 1 Gold Plant on 29 December 2023 which included: -

- a Harmony Purchase Order dated 28 November 2023,
- a Sasol delivery Note and Dangerous Goods Declaration dated 27 December 2023,
- a Sasol Delivery Note Document dated 29 December 2023, and
- a Tanker Services Delivery Note dated 29 December 2023.

Finally, the Chain of Custody package for a cyanide delivery made to FG 1 Gold Plant on 29 December 2023, was sampled which included: -

- a Harmony Purchase Order dated 19 December 2022,
- a Sasol delivery Note and Dangerous Goods Declaration dated 7 December 2022,
- a Sasol Delivery Note Document No 2082462 dated 8 December 2022, and
- a Tanker Services Delivery Note dated 8 December 2023.

Currently No 1 Gold Plant is only supplied with liquid sodium cyanide from certified producer, Sasol. Sodium cyanide is transported by bulk tanker by a certified Cyanide Transporter, Tanker Services Food and Chemicals/Imperial Logistics (Tanker Services), who were recertified on 1st April 2022. There are no other members of the sodium cyanide supply chain.

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

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

X in full compliance with

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

not in compliance with

Basis for this Finding/Deficiencies Identified:

The previous recertification audit observed the following:



Design drawings: GA of liquid sodium cyanide tanks 031-0244-128-M2923 rev 2, 2 October 1984, Civil drawings of bund area and plinths for cyanide storage ,031-0244-128-M2994 rev. 1, 2/10/84, Sodium Cyanide storage tanks 1,2,3 detail 031-0244-128-M2499, rev. 2, dated 2/10/1984, P&IDs (piping and instrumentation diagrams) 031-0244-128-E0295, sighted civil and structural reports Walker Ahier Holzhausen Engineering Consultants CC November 2006. There have been no changes to the storage facilities in the period since the previous recertification audit.

The structural report - Structural Safety Audit, FS One Plant, Welkom, April 2022, (report detail described under 4.8 below) which also includes the cyanide storage and offloading facility was sighted and reviewed. There were no adverse findings for the cyanide offloading and storage facility.

The Sasol inspection report for 2023 was sighted. Chemicals Africa Product Lifecycle Management Customer Facility Assessment Feedback Letter: Date of Audit: - 08 March 2023, Commodity: - Sodium Cyanide, by Sasol Life Cycle Management Specialist: - Mosala Mokoena, Location of the audit Harmony Gold 1 Plant, Free State, South Africa, Audit Outcome: - (93%) Pass.

Cyanide storage tanks are located behind the smelt house, and away from any surface waters. Cyanide gas monitors are placed in the smelt house to monitor for any potential HCN (Hydrogen Cyanide) gas. Fixed HCN monitors (4) are installed at the cyanide offloading facility and the cyanide storage tanks. The Monitors are linked to the SCADA (Supervisory Control and Data Acquisition) in the control room and alarms are shown in the case of HCN gas exceeding 4.7 ppm (first alarm- notice board requires person to wear a gas mask) and 10 ppm HCN gas (second alarm - notice board requires evacuation and reporting). All of the above was verified during the site inspection.

The liquid cyanide truck is parked on a competent concrete pad next to the cyanide storage area. All spillage or washings drain into the cyanide bund area via a concrete trench downslope of the offloading surface. The area is designed with retaining walls and humps to contain any spillage or washings.

The three cyanide storage tank levels are measured, using ultrasonic level sensors with digital displays at the storage area. Monthly Planned Maintenance (PM) inspections by the instrument mechanic of the cyanide level transmitters on Tanks 1, 2 and 3 were sighted. A high-level alarm will sound in the control room if tank levels reach 90%. Tanks are interconnected and all tanks have their own level sensors. Breakdown maintenance is practiced. (Sighted job cards for repairs - 20-08-2020 (Fault found and Tank 2 sensor replaced), and 06-08-2020 - Tank 1 level sensor fault recalibrated.) If one sensor fails, the other two act as backups. An automatic valve has been fitted on the air supply used during offloading that will shut down if the storage tank level reaches 95%. An alarm sounds in the Control Room at 85%.

The cyanide storage tanks are located inside a concrete bund and installed on steel legs with a conical bottom. The cyanide storage bund area is constructed of concrete. It was observed that the concrete is not cracked, the bund was empty, and in a good condition.

No solid sodium cyanide is used on the Plant, only 28 to 32% liquid sodium cyanide, supplied by Sasol in bulk tankers is used. All liquid cyanide storage tanks are located in an open-air environment and are equipped with ventilation pipes at the top of the tanks. The cyanide storage tank farm is fenced and locked, as well as placed inside a Plant

perimeter fence with controlled access. The Access and Key control procedure for the cyanide storage area is in place. Keys are only issued to the shift foreman and the chemical handler. The procedure, Liquid Sodium Cyanide Offloading (UN no. 3414), includes under section 12, Return Key, the requirement to return the cyanide storage farm key after locking. Reagent strength liquid cyanide tanks are placed in a dedicated bund and fenced area, away from any incompatible materials.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 3.2**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

No solid sodium cyanide is used on the Plant, only 28 to 32% liquid sodium cyanide, supplied by Sasol in bulk tankers is used.

The tanker driver is required by the Liquid Sodium Cyanide Offloading procedure to wash the tanker and equipment clean after offloading. Clean up of minor spills is carried out at the end of offloading. Any major spills would trigger the Emergency Response Plan. The procedure also includes the sequence of opening and closing of valves and couplings. Valves, and couplings attached to the storage tanks are the maintenance responsibility of the Plant. These are inspected before every offloading episode. The hose and offloading equipment on the tanker are the maintenance responsibility of the transporter, Tanker Services. PPE (Personal Protective Equipment) requirements are detailed in the procedure which also requires the use of a “Buddy” (a second observing individual) during off-loading. The role, function and training of the “Buddy” are spelled out in the procedure, Buddy Duties – Handling Chemicals.

Red dye is added to the liquid sodium cyanide by Sasol at the Production facility, before delivery to No 1 Gold Plant. The red colour is identified in the Sasol SDS (Safety Data Sheet).

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

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



X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:

The plant has the following procedures:

- 40 Cyanide Process-related procedures
- 13 Cyanide Emergency Procedures
- 19 Cyanide Equipment Procedures
- 2 Environmental procedures

The procedures are signed off by the Plant Manager, Plant Engineer, Plant Safety Officer, Business Unit Leader and Training Officer.

The Mandatory Code of Practice (COP) on Cyanide Management - Harmony 1 Plant COP, dated 31 August 2022, is used. The Backfill Plant operational and emergency procedures were in place and used until the backfill operation was decommissioned in 2022.

The following documents are used to manage and operate the TSF and were sighted and reviewed: -

- S1. TSF COP (Code of Practice) Harmony Gold Mining Company Limited Free State Operations, Tailings Dams, Mandatory Code of Practice for Mine Residue Deposits, latest revision date: - 14 December 2020, rev. 12, drawn up according to Guideline DME (Department of Minerals and Energy) reference number DME 16/3/2/2-A1, Harmony reference MRD 001.
- Harmony Managerial Instruction: - Contractor and Business Partner Management, Harmony Group, dated April 2021.
- Intasol (TSF Contractor) Baseline Risk Assessment Harmony 1 Plant, dated 2022/09/22.
- Intasol Tailings Operational Manual, Harmony No 1 Plant, rev. 3, approved - 3 May 2021, revised 3-yearly.
 - The manual refers to, "...1.5.1. Harmony COP for TSF Management will be the guideline for this operation (Harmony Reference number: MRD 001)". Section 1.8. Procedures, includes procedures for:
 - 1.8.2. Distribution Pipes:
 - 1.8.2.3 Deposition Point change over procedure:
 - 1.8.3. Under Drainage:
 - 1.8.4. Piezometers:
 - 1.8.5. Decant System:
 - 1.8.6. Pool Wall:
 - 1.8.7. Catchment Paddocks:
 - 1.8.8. Return Water System:

Section 1.9. Daily Operations includes daily operational tasks.

- Sampled the following procedures:



- Procedures including PPE (Personal Protective Equipment) and pre-work inspections - sampled ITS_TBRA_004_Penstock Operations, February 2021, ITS_SWP_009 dated Dec 2023.
- Sleeving penstock ITS_SWP_011 Dec 2023, Ver. 10, including PPE, conducting a SLAM (Stop, Look, Assess, Manage) and tasks.
- Harmony Free State Annual Audits: One Plant Tailings Storage Facilities, 2021 Annual Audit Report, Rev. 1, dated April 2022.
- Harmony Free State Annual Audits: One Plant Tailings Storage Facilities, 2022 Annual Audit Report, Rev. 0, dated June 2023.
- Harmony Gold Mining Company, Harmony Free State, Tailings Storage Facilities, Third Quarterly Report for 2022, Rev 0, dated 19 August 2022, approved by Rynier Shields Pr. Eng.
- Harmony Gold Mining Company, Harmony Free State, Tailings Storage Facilities, One Plant TSFs Third Quarterly Report For 2022, Rev 0, dated August 2022, approved by Rynier Shields Pr. Eng.
- Harmony Gold Mining Harmony Free State One Plant TSFs, Fourth Quarterly Report For 2021 Rev. 1, dated November 2021. The report covers the surveillance of FSS2 TSF only and is based on the Hazard Management System (HMS) data that is supplied by the TSF operating contractor, Intasol Tailings, for the period of July to September 2021.
- Harmony Gold Mine Harmony Free State Quarterly Reports, One Plant TSF, Second Quarterly Report For 2023, Rev. 0, dated June 2023.
- Harmony Gold Mine Harmony Free State Quarterly Reports One Plant TSF, Third Quarterly Report for 2023, Rev. 0, dated August 2023.

The plant procedure, High Cyanide Levels in Residue Slime states that WAD cyanide readings are not to exceed 50 ppm in the residue slime at all times. In the Harmony Free State Annual Audits One Plant Tailings Storage Facilities 2022 Annual Audit Report dated June 2023, Table 7-1 states: -

“...

Legal freeboard requirements

Requirement

Reference

1:50 year 24-hour rainstorm plus 800 mm additional freeboard (NWA - National Water Act)	GN 704(6)3
1:100-year 24-hour rainstorm plus 500 mm additional freeboard R527(73)4 (MPRDA - Mineral and Petroleum Resources Development Act)	GN

...”

Various inspections and preventative maintenance activities are undertaken. Operational Inspections are conducted shiftly. The inspection checks include the following:

- Bund areas, leaks and spillage.
- Cyanide crystallisation
- Leach bund clean and empty with no cracks
- Adsorption bund clean and empty with no cracks
- Clean running water available
- Cyanide neutralisation substances available and sufficient

-
- Safety showers and eye wash inspected and checked
 - Dosing pump available and operational
 - Mandown alarms in working condition
 - PPE in cyanide cabin in order and sufficient
 - No leaks on spillage pump or delivery line
 - No leaks on cyanide dosing pump or delivery line.

The following inspections were sampled: - June and December 2021, and June and December 2023.

The DMS (proprietary name) PMS (Planned Maintenance System) includes a range of inspections. Planned General Inspections (Over-inspections) coordinated by the Safety Officer, are undertaken monthly covering the whole plant. Participants include Plant Manager, Plant Engineer, Safety Officer, Unit Leader: Treatment, Unit Leader Mills, Mechanical Foreman, Senior Technicians and Electrical Foreman. Non-conformances identified are added to a list, risk-ranked, actions scheduled, and those responsible to implement are identified. This information is added to the PIVOT (proprietary name) safety action tracking software and circulated to HODs (Heads of Department). Sampled 20 April 2021, 15 November 2022 and 14 September 2023. Items observed and corrected include: - significant corrosion, leaks, visible cyanide precipitation, damaged flange covers, and cyanide leaks.

Intasol (TSF contractor) conducts daily inspections whose reports are bound in monthly books. The inspection checklist includes, PPE (Personal Protective Equipment), if radio communications are working, the TSF Pool, is a personal HCN gas monitor available, delivery pipe lines (including the training lines from the valves), penstock, overtopping, wildlife mortality, general, and are signed by supervisor (over-inspection) and Line Manager. The following TSF inspections were sampled: -

- St Helena TSF - 4 December 2022, FSS2 TSF December 2022,
- St Helena TSF - November 2023, FSS2 TSF November 2023,
- FSS 2 TSF - January 2021, and
- FSS 2 January 2022, St Helena 4 January 2022.

Quarterly TSF inspections and reports by Jones and Wagener (J&W) are conducted and an Annual TSF Audit is conducted: by Jones and Wagener. An "After rain" inspections procedure is in place. The After-Hours Emergency Rain Inspection Procedure, dated 19/9/2022 was sighted. The HMS (Hazard Management System) reports for FSS2 and St Helena 4 from Intasol, including Freeboards Status, tonnage trends, drain flow, Piezometer readings, monthly average densities, and rainfall, were sighted and sampled for: -

- 2021: January, June, November, December
- 2022: August
- 2023: November

Also sighted and reviewed was the monthly inspection checklist for FSS2 and St Helena. The TSF pipelines, pumps and valves form part of the DMS maintenance system. A Maintenance work order for Residue line to FFS2, FSS8, Residue main line for 2021 was sampled.

The "Management of Change" Managerial Directive, rev. 5, dated 12 July 2023 on "Change of Treatment of medical emergencies from St Helena Hospital to RH

Matjhabeng Private Hospital" was sighted. The document was signed off by the Plant Manager, Plant Engineer and Environmental Manager. The Health and Safety portfolio is checked by the Process Manager.

Non-standard operations are managed using different procedures and approaches. In the plant, the following procedures are used for different circumstances. The following procedure relating to stopping the plant are available: -

- Procedure 4.2.1.16 - Starting and Stopping a Cyanide Pump, March 2022.
- Procedure 4.2.1.31 - High Cyanide Levels in the Residue Slime, March 20223.
- Procedure 4.2.1.17 - Reacting to a High Storage Alarm, March 20224. The plant is stopped for planned shutdowns and equipment breakdowns as per Procedure 4.1.1 Stopping / Start Procedure for Harmony One Plant. This includes steps to be followed in the event of stopping and starting the plant. It states the sequence of events including the stopping of the Cyanide pumps and addition of cyanide to the leach. Annexure A of the procedure includes a checklist to be completed in the event of stopping or starting the plant, to ensure safe operation.
- Procedure 4.2.1.6 - Response to a low pH level, March 2022.
- Procedure: Temporary closure or cessation of operations in case of emergencies, abnormal scenarios and planned shutdowns No 4.1.14, dated 13-02-2024. The procedure covers situations such as - work stoppages- lack of ore or other essential materials- economics- civil unrest- legal or regulatory actions. An issue-based risk assessment would be undertaken to customise responses.

In the case of the TSF, the following are applicable: -

- S1. TSF COP Harmony Gold Mining Company Limited Free State Operations, Tailings Dams, Mandatory Code of Practice for Mine Residue Deposits, dated 14 December 2020, rev. 12, includes the Slime Dam Emergency Procedure -Freegold 1 Plant, dated 2023/02/15, rev 5, The procedure includes zones of influence, as well as emergency classifications and detailed plans for each emergency scenario. The scenarios include: -
 - section 4.2 High Rainfall Events,
 - Section 4.3 Structural Failure (Weeping, Sloughing, Cracking, Seepage)
- The Intasol Emergency Preparedness Plan dated 14 May 2023 includes worker unrest.

Harmony One Plant has a DMS 2000 electronic Planned Maintenance System (PMS) which has been in place since 2011. The software covers critical cyanide equipment, including cyanide storage tanks, cyanide pumps, leach and CIP (Carbon in Pulp) tanks, adsorption tanks, elution columns, residue pumps and tanks, cyanide bunds, leach bunds, CIP bunds, valves, and cyanide and residue pipes. The DMS PMS was electronically reviewed and audited to confirm maintenance histories (planned maintenance and breakdown). The pumping equipment is all covered by standby units. Job cards are issued in the case of breakdowns as well as for planned maintenance inspections. The plant is inspected from a structural perspective on a two-yearly basis by an independent professional Structural Engineer with repairs prioritised. See 4.8 below for details on the structural report. All tanks and major pipes (high strength cyanide lines, and the Tailings

line) are thickness tested annually with records retained. By interview, it was noted that the DMS PMS system includes operational and planned maintenance inspections (electrical, fitter, boilermaker, instrument technician), as well as foreman over-inspections, and safety showers.

With regard to inspections at unloading, storage, mixing and process areas, the following are applicable: -

- The Reagent Handler Weekly Cyanide Plant inspection includes the following: - pumps; valves; mandown alarms; Cyanide Cabin PPE (Personal Protective Equipment); Concrete plinths and bund walls; safety signs; the cyanide emergency trailer; the Emergency Room and emergency telephones. Sampled P132488 on 03-01-2024 by Reagent Handler, Doreen Mahlatsi- no findings; P098156 on 04-04-2022 by Peter Pieterse - no findings but replaced flange cover on top of No 2-cyanide tank; P087859 on 31-08-2021 by Peter Pieterse, no findings but deformed plinth fixed and changed faded flange cover, and P127078 on 27-09-2023 by Doreen Mahlatsi, no findings.
- **Tanks.** All tanks are subject to annual thickness testing. Sighted samples of thickness testing results covering 2020, 2021 and 2022, covering adsorption tanks cyanide tanks, leach tanks, residue tanks, TSF pipelines, leach feed lines and cyanide feedlines. Fitter 6 monthly inspections of tanks include: - check tank for corrosion; check pipes and flanges and interlocking pipes for corrosion and white crystals; check Sanders valves for corrosion, leaks and white crystals; ensure cyanide pipes and tanks are colour-coded purple; check delivery pipes, loading pipes and overflow pipe for corrosion, leaks and white crystals. Sampled fitter 6 monthly tank PM (Planned Maintenance) inspections: - P130114, No 2 Cyanide tank on 24-11-2023 by Philip Viljoen - no findings; P097820, No 3-cyanide tank on 31-03-2022 by Philip Coetzee, no findings, P119920, No 2-cyanide tank on 24-05-2023 by Philip Viljoen - no findings. 4. Boilermaker 2 monthly PM inspection: - includes check for corrosion; check rubber lining; check rubber lining of launders; and check for corrosion on steel work. Sampled: - boilermaker 2 monthly PM inspections: - P130721, leach tank No 2 on 08-12-2023 by Dirk Coetzee, no findings, P120673, Leach tank no 2 on 08-06-2023 by Lepile Mosoev, no findings.
- **Secondary containments.** Engineering inspections - 3 monthly PM Bund wall and Floor inspection includes condition of bund wall and floor for any cracks; inspect for cracks and deformities of plaster; and ensure scaling of concrete joints are in proper condition. Sampled: - P131178, leach module 1 and 2 by reagent handler Doreen Mahlatsi on 13-12-2023 - satisfactory; P115868, leach module 1 and 2, on 13-03-2023 by Peter Pieterse - satisfactory; P106307, Leach 3 bund by Peter Pieterse - satisfactory. Flood Tests are carried out 6 monthly in the cyanide storage area and results were sampled: - P124208 tested on 10-08-2023 by Reagent Handler (Doreen Mahlatsi) - satisfactory; P079120 by Metallurgical Business Unit Leader (BUL), Danie Rogers on 12-03-2021 - satisfactory; and P104497 by Peter Pieterse on 21-08-2022 - satisfactory.



- **Leak Detection and collection systems.** There are no leak detection and collection systems at the ponds required in the design documents, and no heap leach or pads on the mine.

- **Pipelines, pumps and valves.**

Pumps. Cyanide dosing pumps are Positive Displacement Bredell Hose Pumps which only require fitter inspections six monthly. Sighted P129696 - weekly fitter PM inspection on cyanide pump NO 1 - no findings; P837859 monthly fitter PM inspection on 1 D frame 12A Tailings pump by Botha Laurence - no findings; P130937 monthly fitter PM inspection on Pump 2C-52 million tailings pump by Botha Laurence- no findings; P130752 monthly fitter PM inspection on 1WSP8A60 - B Klippan, one plant tailings pump by Botha Laurence - no findings; P079208 on 09-02-2021 on 1 D frame 12 A tailings pump by Botha Laurence - no findings; P081711 monthly fitter PM inspection on 2C-52 tailings pump, by Botha Laurence - no findings.

Pipelines - P131920 weekly cyanide pipeline in cyanide area PM inspection by reagent handler on 10-01-2024 - no findings; P1098611 Foreman yearly cyanide pipeline in cyanide area thickness test; P109125 weekly cyanide pipeline in cyanide area PM inspection by Peter Pieterse - no findings; P079735 weekly cyanide pipeline in cyanide area PM inspection by Metallurgy BUL, Danie Rogers on 26-02-2021 - no findings but replaced missing flange cover. There is a daily inspection of the TSF pipeline by the Security Department which reports leaks by exception (sighted seven examples of leak reports made by Security Department in 2023). A more detailed, monthly engineering Planned Maintenance boilermaker inspection of the TSF pipeline is in place. Items inspected include: - leaks, bolts and flanges. rust and corrosion, evidence of damage by illegal miners, presence and condition of warning signs, adequate concrete to support the pipeline, and condition of valves.

Valves. Valves are replaced when they breakdown and no planned maintenance inspections are carried out on valves.

Ponds and impoundments are inspected for their containment of cyanide and solutions and maintenance of the water balance. The surge dam is included in monthly inspections by the Safety Officer. Freeboard is measured monthly by datum poles (reported in Intasol HMS dashboard and Jones and Wagener (J & W) reports), An Independent party survey is done every 3 months and an annual independent party survey using Lidar (LIght Detection and Ranging) is also done. It was confirmed that freeboard measurements appear in dally reports, Monthly Dashboard and Quarterly Jones and Wagener Reports.

Operational inspection frequencies are adequate; PMS inspections frequencies are based on historical breakdowns and maintenance requirements by manufacturers. PM inspections using the DMS 2000 PMS system are carried out as per PMS schedules. Fitters, boilermakers, electricians, instrument technicians and foremen (over inspections) carry out PM (Planned Maintenance) inspections on frequencies that range through daily, weekly, two-weekly, monthly, six monthly and yearly, depending upon individual equipment requirements. Frequencies are reviewed after evaluating breakdowns, and signed off by the Engineer and the appropriate Foreman. The inspections are deemed to be at appropriate frequencies, sufficient to assure and document that the cyanide

equipment and facilities are functioning within design parameters. Inspections on the TSF are conducted as per COP requirements and Intasol procedures. Daily wildlife mortality inspections are conducted. Intasol inspections are carried out daily, weekly, monthly and quarterly. The inspections are deemed to be at appropriate frequencies, sufficient to assure and document that they are functioning within design parameters. The DMS PMS system includes the TSFs.

It was confirmed during the PM inspection sampling above that inspection documentation includes name of inspector, date inspection, and actual date of inspection, observed defects and repairs, and job card requests for more significant repairs, if required. The DMS PMS system is used to track the job card and the completion date. A new OCR (Optical Character Recognition) scanning system is being introduced, which will enable automatic raising of a job card, if an inspection raises a non-conformance on the checklist question on the PC (Personal Computer) tablet. A new paperless system using tablets has been introduced, after a pilot scheme in certain parts of the plant.

Similarly, TSF inspection checklists contain the date of the inspection, and name of the inspector. Faults are reported to the TSF Foreman who sends the report to the Planned Maintenance Foreman who makes out a job card to the engineering department for the required repairs which are also recorded and entered in the DMS PMS system.

The Plant is designed with sumps and sump pumps that would return spillages back to the Process. The emergency surge dam is in place, linked with concrete-lined spillage trenches, providing back-up capacity in case of any power outages at the Plant. The tailings storage facility does not require emergency power resources to prevent unintentional releases and exposures in the event its primary source of power is interrupted. This was confirmed during site inspection.

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

X in full compliance with

The operation is in substantial compliance **with Standard of Practice 4.2**

not in compliance with

Basis for this Finding/Deficiencies Identified:

The operation has implemented a program to evaluate cyanide use in the mill and adjust the addition rate to minimize its use. No 1 Plant has ongoing programs to determine if the standard rate of cyanide addition will ensure the cyanide in the process is sufficient, but no greater than that required, to optimize gold and/or silver recovery.

Six monthly composite samples for leach test work are submitted for leach optimisation (grind, time and reagent consumption including cyanide). A diagnostic leach test is also conducted. Gravity recoverable gold tests are done. The following tests sighted are aimed at determining the standard required rate of cyanide addition:



- Report by SGS Laboratories, 22/2399 Leach optimisation tests, GRG (gravity recoverable gold) tests, and diagnostic leaching (April 2022).
- Six monthly tests by SGS Laboratories: report 21/1746 Final Report: Metallurgical Test work Program on Harmony samples. The samples included Joel, Phakisa, Maiming, Bamabanani West and Tshepong shafts, as well as Freddie's Waste Rock Dump. The tests include cyanidation (effect of grind and reagent consumption), and Kinetic tests.
- A summary table of monthly bottle roll tests from different ore sources was sighted, including cyanide consumption for March 2021 April and June 2022.
- Tests were sighted which included a diagnostic leach test, indicating leachable gold in residue for 2021, 2022 and 2023.

The Metallurgist reviews all reports and makes recommendations on changing the operating parameters, including leach cyanide parameters in order to optimise the process efficiency. The Mine embarked on a "back to basics" approach and started with optimising mill grind to improve reagent consumption and process efficiency. This was confirmed during the interview with the Metallurgist. Recoveries are monitored daily and cyanide addition rates reviewed when necessary for leachable gold in residue.

Feed forward ratio control using the thickener underflow flowrates are implemented. The TAC 1000 (proprietary name) cyanide analyser is used as feedback control for cyanide addition to control cyanide concentration in all three modules. In addition, 2-hourly samples for free cyanide titration are taken from the first leach tank and last leach tank and the last adsorption tank. Titration values are compared with the TAC 1000 in leach tank 1 and investigated if a discrepancy is significant.

The Precip solution (solution remaining once the gold has been precipitated) is returned to the leach from the Smelt House. This is used to reduce the quantity of cyanide addition.

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

An upgraded spreadsheet-based, Probabilistic Water Balance (PWB) was sighted that complies to the probabilistic definition as per the ICMC (International Cyanide Management Code) and includes the Plant and the TSF. The model is populated with a monthly report / model as output and the detailed model, including 2023 monthly data, was sighted. The previous PWB was not representative of the One Gold Plant operation (which changed significantly since the previous re-certification audit) anymore and had to be replaced with the new model.

Inputs into the model include:

- Water in Ore fed to the plant



-
- Make up water from Witpan and 12b, Municipal water, RO (Reverse Osmosis) plant water
 - Rainfall in the plant effective catchment area
 - Return water from surge dam
 - Evaporation data
 - Precipitation: 1:50 year, 24-hour storm event of 75 mm, and 1:100-year, 24 hour storm event of 110 mm.
 - Solution deposit rates are included for the TSF but there are no leach pads on the mine,
 - Precipitation daily data for 2021 and 2022 for plant and tailings
 - The return water dams contain less than 0.5mg/l WAD cyanide and thus are not considered cyanide facilities.

The legal freeboard requirements are 1:50 year, 24-hour rainstorm, plus 800 mm additional freeboard, and 1:100 year 24-hour rainstorm, plus 500 mm additional freeboard. Rainfall is measured and recorded at FFS2 and St Helena TSFs, as well as the Gold Plant, using rain gauges. Local freezing and thawing conditions do not significantly affect precipitation.

The Water Management Procedure, includes the purpose: -

"...The Water Reticulation System of Harmony 1 Plant is complex and requires adequate control over all inflows and outflows of water so as not to allow contaminated water to reach the Sand River system, shallow ground water aquifer, Witpan or Klippan...". This procedure covers managing the water balance to prevent overtopping of the return water dams and considers the PWB. There is no discharge from the operation to surface waters. The phreatic surface is considered in the various Jones and Wagener (Engineers of Record) Annual and quarterly reports.

The return water levels are measured by the Outside Maintenance Department and the TSF freeboard is measured as per the Intasol daily, weekly and monthly reports and is also surveyed using drones and Lidar (LIght Detection and Ranging – remote sensing). The freeboard is also reported in the annual and quarterly reports. The 2021 and 2022 Annual reports were sighted and reviewed for this data. The Surge Dam level is monitored by each shift, and this is reported in the Thickeners Log Sheet.

Intasol conducts daily, weekly, and monthly inspections including the TSFs and return water dams. The Procedure, Respond to Abnormal and Emergency Conditions, stipulates that the Plant Surge Dam (also known as the PCD-Pollution Control Dam)) should be kept empty, and the pump operational at all times in order to prevent the dam from overflowing.

The new PWB includes daily rainfall data tables and includes a Monte Carlo simulation (a probabilistic model that can include an element of uncertainty or randomness in its prediction) of the data. This outcome is included in the Surge Dam analyses and freeboard parameters on a monthly basis. The operating practices are reviewed during quarterly and annual TSF reviews. Annual reviews of 1: 50 and 1:100 (from 120 mm to 136 mm in a 24-hour period) yearly rainfall events take place, based on past yearly results.

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



X in full compliance with

- The operation is**
- in substantial compliance with **Standard of Practice 4.4**
 - not in compliance with

Basis for this Finding/Deficiencies Identified:

Graphs and data for daily, averaged WAD (Weak Acid Dissociable) cyanide levels in 2021, 2022 and 2023 at the compliance point were reviewed.

In 2021, there were 20 individual or grouped exceedances of the 50mg/l WAD cyanide limit. These were all investigated. The main causes identified were: - prolonged addition of precip solution to the leach circuit to increase the number of elutions for gold extraction; filter clogging after slime build-up or power surges; and cyanide pipe leaks.

In 2022, there were 14 exceedances, all of which were investigated. The main causes were: - High WAD cyanide levels due to increased cyanide addition; prolonged addition of precip solution to the leach circuit to increase the number of elutions for gold extraction; and the TAC 1000 analyser under-reading.

In 2023, there were only 2 exceedances which were investigated and found to be caused by the WAD analyser being off-line and the TAC 1000 analyser to be under-reading. Over the three-year period, Plant management has increasingly emphasised the detriment of having WAD cyanide exceedances and ensured that WAD cyanide values are discussed in the daily Short Interval Control meetings to ensure immediate actions are taken to minimise and eliminate exceedances and to lessen the turnaround time. This has proven to be successful, judging by the decreasing numbers of exceedances over the three-year period.

At the open water Witpan pumpstation in 2021, 2022 and 2023 all samples were less than limits of detection 0.25mg/l WAD cyanide. The open Water Return water dams 12 A and 12 B, samples are taken weekly for WAD cyanide. Values for 2021, 2022 and 2023 were less than the limits of detection of 0.25 mg/l WAD cyanide. As the values are less than 0.5 mg/l WAD cyanide, these dams are not deemed cyanide facilities according to the ICMI definitions. All WAD cyanide values are less than 50 mg/l WAD cyanide and the noted exceedances were investigated and explained. Thus, no special measures are required on the TSFs.

Intasol, the TSF contractor, conducts daily TSF inspections (which include mortality inspections) which are bound in monthly books. No wildlife mortalities were reported in the sampled documents. The staff interviewed reported that no cyanide-related wildlife mortalities were reported since the previous recertification audit. It is thus deemed that the 50mg/l WAD cyanide limit is effective in preventing significant wildlife mortalities.

There are no heap leach operations at the mine.

All WAD cyanide values are less than 50 mg/l WAD cyanide, and the noted exceedances were investigated and explained. Thus, no special measures are required on the TSF.



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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

No direct discharge to surface water takes place. A Pollution Control Surge Dam is in place for containment of any overtopping of water ponds and storm water ponds. The operation does not have an indirect discharge to surface water. The Mine demonstrated that no indirect discharge occurs at the Witpan (lake) by sampling groundwater.

Groundwater boreholes are sampled for WAD cyanide. The following monthly data shows when concentrations that exceeded 0.25 ppm (detection limit) were recorded.

- BH1 - Monthly upstream of FSS2 TSF (“Upstream”): 2021 (spike 4 February 0.26 and 4 March 0.29 - all values less than 0.25mg/l WAD cyanide), 2022 and 2023: less than limits of detection 0.25 ppm WAD cyanide.

- Plant Borehole BH1: 2021, 2022 and 2023, all values less than limits of detection 0.25 ppm WAD cyanide

Borehole BH14 - Monthly downstream of FSS2 TSF: 2021, 2022, 2023 -, all values less than limits of detection 0.25 ppm WAD cyanide.

Borehole BH13 - Monthly downstream of FSS8 TSF: 2021, 2022, 2023 -all values less than limits of detection 0.25 ppm WAD cyanide.

Borehole BH186 - Weekly downstream of Witpan: 2021 (spike 25 Feb 0.25, 16 Sept 0.29, 30 Sept 0.55), 2022, 2023 -Less than limits of detection 0.25 ppm WAD cyanide. FSS2 Solution Trench (“Upstream”) – Less than limits of detection 0.25 ppm WAD cyanide.

Borehole BH187 - 2021, 2022, 2023 -Less than limits of detection 0.25 ppm WAD cyanide.

12A (“downstream”) – Less than limits of detection 0.25 ppm WAD Cyanide. The “downstream” source is the Witpan which takes raw sewage from the local municipality and has no aquatic life.

It is noted that all samples from 2023 have been less than the limits of detection.

Indirect discharges from the operation have not caused cyanide concentrations in surface water to rise above levels protective of a designated beneficial use for aquatic life and therefore the operation has not had to engage in remedial activity to prevent further degradation.

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

X in full compliance with



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

not in compliance with

Basis for this Finding/Deficiencies Identified

It was confirmed during the site visit that the TSFs are equipped with under drains, paddocks and solution trenches to divert the water to the return water dam (RWD) system.

There is no numerical standard established by the applicable jurisdiction for WAD cyanide or any other species of cyanide in groundwater, therefore there are no compliance points below or down gradient of the gold plants or tailings facilities.

Groundwater boreholes were sampled for WAD cyanide. The following monthly data shows when concentrations exceeded 0.25 ppm (detection limit) until decommissioning in 2022.

- Borehole BH1 - Monthly upstream of FSS2 TSF: 2021 (spike 4 February 0.26 and 4 March 0.29 - all values less than 0.25mg/l WAD cyanide), 2022 and 2023: all samples less than the limits of detection 0.25 ppm WAD cyanide.

- Plant Borehole BH1: 2021, 2022 and 2023, all values less than limits of detection 0.25 ppm WAD cyanide.

- Borehole BH14 - Monthly downstream of FSS2 TSF: 2021, 2022, 2023 -, all values less than limits of detection 0.25 ppm WAD cyanide.

- Borehole BH13 - Monthly downstream of FSS8 TSF: 2021, 2022, 2023 -all values less than limits of detection 0.25 ppm WAD cyanide.

It is noted that all samples from 2023 have been less than the limits of detection.

The backfill plant was operated from the previous re-certification until it was decommissioned on 29 June in 2022. Backfill standards limits, at the time it was operated, controlled the free cyanide in the final product sent underground to less than 20ppm free cyanide.

The auditors observed during the previous recertification audit, procedure MMSA-PL Backfill calculator, which is used to ensure that the correct number of bags of Ferrous Sulphate were used to ensure that the backfill sent underground was below the 20 ppm WAD limit. Weekly samples to Bambanani Backfill Receiving from the plant were reviewed for the period the Plant operated and all values were less than 50 mg/l WAD cyanide. There was no seepage containing cyanide concentrations of groundwater above levels protective of beneficial use, therefore no remediation activity was required or undertaken.

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

X in full compliance with

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

not in compliance with



Basis for this Finding/Deficiencies Identified:

The following was verified during the site visit, and is unchanged from the previous recertification audit: -

- The reagent strength cyanide tanks are placed in a concreted bund and are supported by steel legs on plinths.
- The elution reagent tanks and columns are placed in bunded areas and are on solid concrete bases.
- CIL (Carbon-in-Leach) and Leach tanks are placed on solid concrete bases, draining onto a competent concrete floor into a spillage pump returning spillage to tanks.
- The Plant floor area is covered by concrete and brick paving and linked to the emergency surge dam by concrete-lined spillage trenches. The surge dam is installed downstream to contain Plant spillage, storm water and leach / CIP (Carbon-in-Pulp) bund overflow.
- The residue tank and pumps are situated on concrete, and the bund drains into the emergency surge dam via concrete lined trenches.

The Cyanide storage tank bund is 195m³, and the largest tank size is 50m³. The three cyanide tanks are interlinked to form a total of 150m³. The largest leach tank is 758m³, and the bunds are 689.92m³ (module 3), and 11 439m³ (module 1 + 2). CIP1 and 2 largest tank is 270m³ and the bund is 701m³. The CIP3 largest tank is 270m³ and the bund is 412m³. The largest Elution column is 11m³ and the bund is 19.8m³. The Elution reagents largest tank is 33m³, and the bund volume is 154m³. The Residue largest tank is 178m³ and the bund is 70m³. All cyanide process tanks have competent secondary containment.

The concrete-lined surge dam (or Pollution Control Dam – PCD) volume is 15000m³. The leach, CIP, Elution, and Residue bunds are all linked via the concrete-lined trenches leading to the surge dam via an interim weir/pumping arrangement returning the spillage back to the thickeners. The linked concrete-lined PCD of 15000m³ provides sufficient capacity to contain 110% of the volume of the largest tank which is the leach tank at 758m³. The dam can further accommodate a 1:50 year storm event.

The Procedure, Respond to Abnormal and Emergency Conditions, states that, “...the Surge Dam should be kept empty and the pump operational at all times...the Surge Dam should never overflow...”

The findings reported in the previous recertification audit remain unchanged. Reagent strength pipelines were risk assessed and launders were installed over the whole length of the pipeline. The launders either drain into the cyanide reagent storage bund or into the cyanide decontamination area, which is equipped with an automatic sump pump that pumps any liquid into the leach tanks before the TAC 1000 on line analyser in the leach measures levels. All slurry pipelines in the Plant run across concrete-lined or paved areas draining to the emergency surge dam via concrete-lined trenches. The tailings pipeline is concrete-lined from the tailings pumps to the TSF. The tailings pipelines are steel lines and thickness testing is done. TSF contractor, Intasol, conducts daily residue pipeline inspections, which are reported to the Harmony Tailings Foreman or direct to the plant in case of significant emergencies.



The area where the TSF pipeline runs next to the Witpan (lake) is flanked by earth bunds to contain spillages and protect the surface water. An additional spillage paddock is in place above the flood line of the Witpan to provide additional protection. The pipeline is observed by security during daily security patrols for leaks and any leaks are reported by exception to the Plant Control Room or TSF senior personnel. A sample of incident reports, originating from security patrols, reporting pipe leaks and bursts were sampled covering 25 January 2023, 4 April 2023, 1 June 2023, 22 July 2023, 14 October 2023, 25 October 2023, and 1 December 2023.

The cyanide reagent tanks, leach tanks, adsorption tanks and residue tanks are constructed of mild steel and the pipelines within the plant and at the TSF are constructed of steel.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 4.8**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

In the original certification audit, in the absence of QA/QC (Quality Assurance/Quality Control) documentation, an appropriately qualified person reported that the facility could be operated as fit for purpose. No additions to the cyanide facilities in the Plant have been made since the previous audit.

St Helena 4 TSF was recommissioned for use by FG 1 Plant and the design and construction was managed and reported on by Jones and Wagener (J&W), Engineers of Record, and commissioned at the end of August 2021.

The Harmony Gold Mining One Plant Future Deposition St Helena 4 Recommissioning Construction Close-Out Report dated March 2023 2. The report stated, "...J&W initially provided part-time and then full-time quality assurance of the construction works from October 2021. All method statements were reviewed and approved by J&W prior to each item being constructed. Material approvals and inspections and addressing of technical queries were conducted by J&W throughout the duration of the project. Non-conformances were raised and closed out and site instructions were carried out to the satisfaction of J&W. As-built drawings and the contractor's data pack are attached to this report. The certificate for practical completion was issued by J&W on 21 February 2023..."

The report was prepared by Engineer Louis Geldenhuys and signed on 04/10/2022, reviewed by Engineer Kholofelo Malope and signed on 01/11/2022, and approved by Associate Rynier Shields Pr Eng and signed on 07/03/2023. The report was reviewed and confirmed to include sections on Design, construction components, construction (construction management, construction monitoring including Quality control and

assurance). The appendices include “As built” drawings, contractors data pack, and QA/QC information.

A more recent Structural Safety Audit, FS One Plant, Welkom, Report K2783, April 2022 was sighted and reviewed. The report was prepared by Indaba Professionals (Pty) Ltd, and conducted by Mr. Jan Dykman - Professional Engineer registered with the Engineering Council of South Africa (ECSA) registration number 20140475).

The Executive summary states, "...1.1.2. This report is based on our visual inspections and describes the necessary repair and maintenance requirements. These requirements are summarized in Table 1, and must be read in conjunction with our current- and previous reports. Refer to Annexure 1 for a layout of FS One Plant."

The report included a table indicating emergency repairs, repairs and maintenance, linking to photographs. In an interview, the Plant Engineer reported that all the repair items were allocated a job card number and all the emergency repairs have been completed, or corrective action taken resulting in re-prioritising to a lower risk rating. Other lower priority repairs have been added to the on-going repairs and Plant refurbishment schedule.

The Conclusions include the following: -

"...4. CONCLUSION

4.1.1. Harmony is continuously busy with repair and maintenance programs, on their metallurgical plants and shafts. Indaba Professionals were appointed as part of those programs, to do a structural safety audit on FS One Plant.

4.1.2. Onsite visual inspections were done on 20 and 21 January 2022, by a Professional Engineer who is registered with the Engineering Council of South Africa (ECSA). Structural defects and the necessary repairs were identified and were assigned to the three previously mentioned categories.

4.1.3. This report described the structural repairs that must be done, to ensure that the various installations, remain safe and functional. Guidelines were also provided, that will assist the client in the planning of- and in budgeting for the required repair and maintenance actions"

The Harmony Gold Mining One Plant Future Deposition St Helena 4 Recommissioning Construction Close-Out Report, March 2023, was sighted and reviewed. The report stated, "...J&W (Jones and Wagner, Engineers of Record) initially provided part-time and then full-time quality assurance of the construction works from October 2021. All method statements were reviewed and approved by J&W prior to each item being constructed. Material approvals and inspections and addressing of technical queries were conducted by J&W throughout the duration of the project. Non-conformances were raised and closed out and site instructions were carried out to the satisfaction of J&W. As-built drawings and the contractor's data pack are attached to this report. The certificate for practical completion was issued by J&W on 21 February 2023... "

The report was prepared by Engineer Louis Geldenhuys and signed on 04/10/2022, reviewed by Engineer Kholofelo Malope and signed on 01/11/2022, and approved by Associate, Rynier Shields, Pr. Eng. and signed on 07/03/2023. The report was reviewed and confirmed to include sections on design, construction components, construction, construction management, construction monitoring and including quality control and assurance. The appendices include “As built” drawings, and contractors data packs.

Harmony TSFs are continuous operations using paddock deposition methods. The TSF are monitored by the Contractor, Intasol, and Jones and Wagener (J&W), a professional Geotechnical Company, who have qualified and registered Geotechnical Engineers signing off all Quarterly and Annual TSF reports, including observations, future work, and follow up. The reports include recommendations in the case the TSF is not fit for purpose and cannot be safely operated. TSF FSS8 was stopped briefly in 2020 due to such concerns. The following Quarterly Reports and audits were sampled and reviewed: -

- Harmony Gold Mining Company, Harmony Free State, Tailings Storage Facilities, FSS 8 Third Quarterly Report For 2022, dated 19 August 2022 approved by Rynier Shields Pr. Eng. The report confirms ongoing monitoring and addressing issues identified during the inspections.
- Harmony Free State One Plant TSFs Fourth Quarterly Report For 2021, dated 1 November 2021, prepared by Engineer Fazil Memon 19/11/2021, Reviewed by Associate Ljiljana Nedeljkovic 19/11/2021, Approved by Associate Rynier Shields Pr.Eng. 19/11/2021. Included was, "...Section 2.12 Recommendations / Future Works: The following studies/works are recommended to be carried out in 2021:
 - Addressing concerns related to large inundation zones around the TSF and in the solution trench after heavy rain..."
- Harmony Gold Mine Harmony Free State Quarterly Reports One Plant TSFs Second Quarterly Report for 2023 dated June 2023, prepared by Engineer Aviwe Mhlakaza, BSc. Eng. 05/05/2023, reviewed by Engineer Roelanie Greyling, Pr. Eng. 19/05/2023, and approved Associate Rynier Shields, Pr. Eng. 21/06/2023. The report covers both FSS2 and St Helena 4 TSFs. Included in the Report was: -
- "...3.11 Recommendations / Future Works: ...The following work, related to the operation of St Helena 4 TSF, is recommended for FY23/24 ... Section .12 Recommendations / Future Works: ...Continuously limiting deposition to 150 000 tpm (tons per month) to reduce slurry flow rates to help to improve freeboard...It is essential that pool depth remain below the allowable level of 300mm..."

The Engineers of Record required TSF FSS8 to be decommissioned as per the 2021 Annual reports. This was done and the dormant dam is monitored quarterly. No other issues were noted to stop repositioning on the FFS 2 and St Helena 4 TSF. Recommendations were made on issues identified. Jones and Wagner issues monthly monitoring reports on the TSF - sampled reports of December 2023. Intasol issues monthly deposition feedback reports and the report dated 31 July 2022 was sampled. The report includes photographic feedback including descriptions on progress made.

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

X in full compliance with

The operation is

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

Basis for this Finding/Deficiencies Identified:

The Procedure Harmony One Plant Cyanide WAD Sampling and Analysis, was sighted and reviewed. It covers surface and borehole sampling and requires sign off by the Plant Manager and Plant Engineer. The procedure was developed by Sharon Rampton, Harmony Laboratory Manager, and a laboratory specialist who has a Mine Assayers certificate of competency dated 12/11/1988. There is no change to the evidence from the previous re-certification audit. There is no written procedure for wildlife monitoring activities. However, the TSF contractor, Intersol, is required to formally report any wildlife mortalities daily and the Environmental Department will investigate any wildlife mortalities on site.

The Procedure, Harmony One Plant Cyanide WAD Sampling and Analysis, includes the following: -

- Sample Preservation: Section 4, page 4,
- Sample Chain of custody: Section 4, page 4,
- How samples are taken, Section 4 pages 4 and 5,
- Where samples are taken: Section 4,
- Cyanide species to be analysed: Section 4 pages 4 and 5 - WAD cyanide and Free cyanide, and
- Quality Control at Laboratory: The laboratory is accredited with SANAS (South African National Accreditation System) which includes operations and Quality Control. The SANAS certificate of accreditation Harmony Gold Ltd., accreditation number T0520 for Chemical Analyses ISO/IEC (International nomenclature) 17025:2017 (the international standard for testing and calibration of laboratories), effective date 29 June 2022, expiring 28 June 2027 was sighted.

Sampling conditions are reported on the Result report sheets. Report sheets for 2021 to 2023 were sampled, containing human influences, livestock and wildlife, weather conditions and any extraneous comments.

Plant and TSF monitoring is done weekly, borehole sampling is done monthly, and community sampling is done quarterly. Wildlife is monitored daily for any mortalities.

The Plant residue WAD cyanide is sampled continuously every 20 minutes online using a WAD 1000 analyser. Sampling frequencies are deemed adequate to characterize the medium being monitored and to identify changes in a timely manner.

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

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

X in full compliance with



The operation is in substantial compliance with **Standard of Practice 5.1**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

The Decommissioning Plan for Harmony One Plant was sighted and reviewed. Decommissioning includes activities such as:

- Decontamination of equipment;
- Removal of residual cyanide reagents;
- Installation of measures necessary for control or management of surface or ground water such as pumping and treatment systems that would operate during the facility's closure period.

It was confirmed that the decommissioning Plan included Section 6, Sequence of Decommissioning Activities, and that the Plan needed to be reviewed annually or after any significant modifications have been made to the cyanide-containing facilities and/or equipment on the plant.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 5.2**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

The Closure Cost Assessment Reports, for Bambanani (which included No 1 Gold Plant), Prepared for Harmony Gold Mining Company Limited by consultants, Digby Wells Environmental, for 2021, 2022 and 2023 were sighted and reviewed.

The same section, section 12, appeared in all three reports with the only difference being the cost figure for the cleaning and removal of sodium cyanide.

“...Section 12 Cyanide Decontamination

Harmony is a signatory to the International Cyanide Management Code which was developed by a Steering Committee under the guidance of the United Nations Environmental Program (UNEP) and International Cyanide Management Institute (ICMI). The purpose of the code is to create and generate information for responsible cyanide management practices related to cyanide use including the gold mining industry. Thus, Harmony, as a signatory, is required to set aside money for the closure of cyanide plant. A figure of R 672,146 (2021), R707,098 (2022) and R757,302 (2023) has been included for the third-party cleaning and removal of sodium cyanide systems. This figure is based on a quotation from a reputable Cyanide Cleaning Specialist. The basis for this figure includes the following activities:

- Test for explosive gas and high pressure (HP) cleaning of tanks and equipment;
- Flame cut all lines and equipment into 1 metre lengths for safe disposal; and

● Removal of all cyanide pipes and drip trays from Cyanide Tanks to Pachuca’s...”
The costs are based upon funding third party implementation of the cyanide-related decommissioning measures.

Closure cost estimates are updated on an annual basis as per the Minerals and Petroleum Resources Development Act no 28 of 2002. The estimates are reviewed externally every year. It is required by law that a Trust Fund be established to fund decommissioning and closure strategies, including cyanide. The Trust Fund financial statements for the year ending 2021, included in the document Avgold Nature Conservation Trust prepared by Price Waterhouse Coopers (accountants and auditors) and signed on 16/5/2022 by Herman Perry were sighted and reviewed. Similarly, the Freegold (Harmony) Propriety Limited Mine Trust Fund financial statements for the year ending 30 June 2022, included in the document Avgold Nature Conservation Trust 2605/92 prepared by Price Waterhouse Coopers and signed on 31 May 2023 by Herman Perry witnessed by Melanie Naidoo-Vermaak, both Trustees, and signed by Price Waterhouse Coopers’ CS Masondo, Registered Auditor, 31 May 2023, were sighted and reviewed.

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

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

X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:

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 minimize worker exposure. A number of Plant and TSF procedures were sampled and reviewed and it was confirmed that they required the use of appropriate PPE (Personal Protective Equipment) and pre-work checks and inspections. These were: -

- Procedure 4.4.1.4 - Liquid Cyanide Offloading UN no. 3414, March 2022
- Procedure 4.2.1.2 - Cyanide delivery and storage planning, March 2022
- Procedure 4.2.1.3 Cyanide Vessel Decontamination, March 2022
- Procedure 4.2.1.7 Titration of Cyanide and Lime Procedure, March 2022
- Procedure 4.2.1.8 - JT_RA_SM_154 Clearing blocked cyanide pipelines, Rev. January 2023
- Procedure 4.2.1.14 Sampling of cyanide bearing solution, Rev March 2022
- Procedure 4.2.1.22 Cyanide Dosing Changes, Rev March 2022
- Procedure 4.2.1.23 Clearance Certificate for Vessel Entry, Rev Mar 2022



- Procedure 4.2.1.32 Operating the WAD 1000 Cyanide Analyser, Rev March 2022.

For the TSF: -

The following Standard Work Procedures (SWPs) were sampled:

- ITS_TBRA_004_Penstock Operations, February 2021, ITS_SWP_009 dated December 2023
- Sleeving penstock ITS_SWP_011 December 2023, Ver. 10 including PPE, conducting a Stop Look Assess Manage (SLAM mini risk assessment) and tasks description for the safe operation of the TSF.

All the procedures including PPE and pre-work inspections. The Plant and TSF use the Harmony Continuous Risk Assessment SLAM system (Stop - Look - Assess and Manage) in place covering the pre-work inspections.

The starting point for developing new Health and safety procedures is the preparation of an issue-based risk assessment, which includes workers and management involved with the task. The procedure drafter will then meet with those involved with the task and agree on the broad outline of the procedure. Thereafter, the procedure drafter will prepare the draft procedure and circulate it for feedback and the agreed document will be signed off. The procedures are evaluated by calling for comment and input from effected employees. The TSF contractor conducts PTOs (Planned Task Observations) and annual refreshers on procedures. Any problems resulting from PTOs and training will be discussed and either procedures will be amended or training or refresher training undertaken.

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

X in full compliance with

- The operation is**
- in substantial compliance with **Standard of Practice 6.2**
 - not in compliance with

Basis for this Finding/Deficiencies Identified:

10.5 pH (a logarithmic scale used to specify the acidity or basicity of aqueous solutions) is the level currently being controlled in the Leach Reception Tank. 2 hourly titrations are done for pH. Automated and timed lime is added on the line before the thickeners. There is a procedure, Response to low pH level (increased acidity), which states that before cyanide is added into the pulp at the Leach section, it is imperative that the pH is >10.5. Discharge points of cyanide must always enter the process where the pH is maintained above 10.5 (more alkaline) and where the area is well ventilated at all times. The procedure also stipulates the reporting procedures and actions required in the event that the pH drops below 10.5. The procedure, Titration of Cyanide and Lime, is part of the pH measuring and managing process.

Quarterly cyanide “hotspot” surveys are conducted with handheld cyanide gas monitors at the following areas.



-
- Cyanide Storage Vessel 1, 2,3;
 - Caustic Make-up area;
 - Walk way past storage area;
 - Leach Reception Tank M1, M2, M3;
 - Leach No 1 Tank M1, M2, M3;
 - Leach No. 1 Tank M1, M2, M3;
 - Leach Nr. 9 Tank M1, M2, M3;1.
 - Adsorption No.1 Vessel M1, M2, M3;
 - Adsorption No 4 Vessel M1, M2, M3;
 - Adsorption No 7 Vessel M1, M2, M3;
 - Residue Area; and
 - Eluant Storage + Reactor 1, 2, 3.

Hotspot surveys undertaken from 29 August 2020 to 11 November 2023 were reviewed and no readings were recorded exceeding 4.7 mg/l HCN gas. Hotspot signage was observed during plant visit at cyanide dosing points and cyanide storage.

Ten fixed HCN (Hydrogen cyanide) gas monitors have been installed at the following areas:

- Leach Module 1 dosing point;
- Leach Module 2 dosing point;
- Leach Module 3 dosing point;
- Two inside the Cyanide Storage facility;
- 1 at the caustic cyanide make-up;
- 1 at the Bottom tanks
- 1 at the Bottom pumps and
- 1 at the Top tanks

Installation location is based upon original gas surveys identifying potentially high HCN gas areas.

16 portable HCN gas monitors units (Honeywell BW Solos) are used in the plant and at the TSF area;

- 1 x Adsorption
- 1 x Foreman
- 1 x Leach
- 1 x Slimes dam
- 1 x Elution
- 1 x Leach
- 1 x Emergency Room
- 1 x Cyanide Cabin
- 1 x Slime dam
- 1 x Ambulance
- 1 x Slimes dam
- 1 x Hospital
- 1 x Smelt house
- 1 x Instrument Workshop
- 1 x Contractors and
- 1 x Spare



Use of appropriate PPE is governed by the procedures covering the tasks being undertaken.

Hydrogen cyanide monitoring equipment is maintained, tested and calibrated as directed by the manufacturer. (Honeywell Series 3000 - installed between 2022 and 2023 and records are retained for 3 years.) The manufacturer and supplier conduct calibration of the fixed and personal monitors every 3 months and on-site bump tests and inspections are conducted by the instrumentation staff.

The calibration certificates for all Honeywell fixed and portable HCN gas monitors were reviewed. There were gaps in records but faulty monitors were returned to the manufacturer and exchanged and/or repaired so that temporary calibrated monitors replaced the damaged monitors until they were swapped when returned. A spreadsheet record of portable gas monitors tracking calibration, repair and exchange status of all identified HCN gas monitors was sighted. Plant Instrument Technicians carry out basic maintenance and bump tests on a weekly basis triggered by the DMS PMS system. This was confirmed during discussions with the Instrumentation staff and the PMS Planner. (Examples of weekly fixed and portable gas monitor checks were sighted.)

Warning signs have been placed at the Cyanide off-loading and storage area, at the Leach, and dosing points of all three modules. The signboards include no eating, no drinking, no smoking, and no naked flames. PPE requirements are stipulated on the signboards at the specific areas, and at the entrance to the plant. Signage on the plant includes action requirements for HCN gas readings of 4.7 ppm - wear gas mask. 10 ppm, evacuate and report. Signage on the whole plant was of excellent quality and design. Warning signs at TSF access points and along the perimeter are in place. Concrete signs are used to warn of no potable water, no eating and drinking, no swimming, no livestock, no cycling, no walking, and no motorcycling. English is used together with symbolic signage. This was confirmed during the site inspection. A major sign is erected at the entrance of the TSF, highlighting potential assembly and access points for ambulances. Annual cyanide induction includes cyanide in slurries and solutions.

The Sasol Safety Data Sheet (SDS) for Sodium Cyanide Solution includes in Section 9 Chemical and Physical Properties: colour - light to dark red. The red dye is added to the liquid sodium cyanide by Sasol at their Production Facility.

It was observed during the site inspection that safety showers, low pressure eye wash stations and dry powder, non-acidic fire extinguishers have been placed at the cyanide off-loading and storage areas, leach section and other strategic areas.

Safety showers are listed on the DMS PMS system and are inspected by operations weekly and maintenance weekly and monthly (Weekly Fitter PM inspection includes: - check potable water, check automatic foot plate, check activation valve, check alarm, check eye wash condition and clean, if necessary, check if flashing lights work, check condition of spray nozzles, check pressure gauge, check condition of water hose, check symbolic signs check foot lever operation and check for corrosion.). Reviewed hard copies and confirmed inspections electronically with PMS Planner. Safety showers are also included in the safety officer's inspection. Safety showers are connected to an audible alarm and a pop-up alarm on the SCADA (Supervisory Control and Data Acquisition) system in the control room. Safety showers and eyewashes were tested and found in working order during the site inspection.

Fire extinguishers are inspected by Firequip (specialist fire servicing subcontractor) monthly and serviced annually. Fire extinguisher maintenance and inspection is done according to tags on the fire extinguisher units and a new electronic scanner system which stores the data at FireQuip and is used in conjunction with monthly physical inspections. Non-acidic extinguishers are located at the cyanide storage area. The extinguisher control system was explained by Andre Knoetze of Fire-Quip and electronic data storage and data scanner demonstrated on sample non-acidic fire extinguishers and CO₂ (carbon dioxide) extinguishers, Extinguishers used in Cyanide Storage Area were sampled and reviewed electronically and filtered from main extinguisher records. All non-acidic fire extinguisher inspection and maintenance records are up to date.

Pipe labelling including direction of flows of the reagent strength pipelines was confirmed during the site inspection. Lower strength solution pipelines are colour coded, but do not have flow direction on them. Cyanide Process and Storage Tanks are labelled to alert workers of their contents. TSF slurry lines are labelled at crossings and where paths or roads pass close by. Emergency boards showing the emergency number to phone in case of slurry pipe leaks or spillage is erected every 200 m on the St Helena TSF 4 tailings line next to the public road. Examples of boards were sighted during the site inspection.

It was confirmed during the site inspection that SDSs (Safety Data Sheets) are available at the cyanide storage cabin and on notice boards. Cyanide first aid boards and medical protocols in English were sighted at dosing points, the cyanide storage area, and the first aid cabin at entrance to the plant area. English is the working language on the plant.

No cyanide related incidents occurred since the last recertification audit. If any cyanide incidents were to occur, the Occupational Health and Safety (OHS) Management System, Module 10, Accident / Incident Investigation and Analysis, Reference Manual, January 2018 would be used to investigate and evaluate the incidents. To review the system, an Investigation Report was sighted. The incident occurred on 8/3/2023, and Mr Peter Sibiti, milling section, had burns on his lower arm.

The Investigation Report includes the following information:

- Description of incident;
- General agency;
- Findings by the investigation team during the in loco inspection on the day of the incident;
- Factors that contributed to this accident
- Immediate causes;
- Basic causes;
- Management Systems Failure; and
- Remedial actions to prevent recurrence.

Any incident investigation is shared with other Harmony Mines.

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

X in full compliance with

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

not in compliance with

Basis for this Finding/Deficiencies Identified:

It was confirmed during the site inspection that potable water, oxygen, antidote kits, resuscitators and radios/telephones, are available. Mandown alarms are readily available for use at the cyanide unloading, storage and leach areas, and backfill area. Safety showers are linked to an alarm and pop up on the SCADA system in the control room when activated.

The Reagent Handler Weekly Cyanide Plant inspection includes the following: - mandown alarms; Cyanide Cabin PPE (Personal Protective Equipment); the cyanide emergency trailer; the Emergency Room and emergency telephones. It was confirmed during the site inspection that all Plant cyanide antidotes were stored in fridges and expire in June 2024. The antidotes are replaced on a schedule organised by the Mine Medical Hub.

The procedure, Harmony 1 Plant: Cyanide Emergency Preparedness Procedure, and the Emergency Preparedness and Response Procedure are in place and up to date and details the necessary responses to cyanide exposures via ingestion, inhalation, and absorption through the skin and eyes. The TSF COP Harmony Gold Mining Company Limited Free State Operations, Tailings Dams, Mandatory Code of Practice for Mine Residue Deposits includes the Slime Dam Emergency Procedure - Freegold 1 Plant. The procedure includes zones of influence, as well as emergency classifications and detailed plans for each emergency scenario. The scenarios include: - Section 4.2 High Rainfall Events, and Section 4.3 Structural Failure (Weeping, Sloughing, Cracking, Seepage).

All plant personnel and fixed term contractors have been trained in Cyanide First Aid and are therefore able to respond to a cyanide emergency. All employees are required to complete First Aid Level 2 training. Dedicated emergency response teams are also available and consists of 15 members spread over the shifts and the engineering department. The team receive the following training: Fire marshal training, Cyanide gas monitor training, SCBA (Self-Contained Breathing Apparatus) set, CPR (Cardiopulmonary Resuscitation) and Defibrillator training. The TriPac cyanide antidote is only administered by trained First Aiders, paramedics or medical doctors. The emergency team from the plant will respond to any cyanide related emergencies at the TSF. A fully equipped cyanide emergency room and cyanide emergency trailer is available in the plant which were confirmed and inspected during the site inspection.

An Agreement was in place with St Helena Hospital and Netcare 911 for the transport and treatment of cyanide patients - refer to 6.3.6 below for details and agreements. There is a new contract in place with RH Matjhabeng Private Hospital: Agreement between Harmony Gold Mine and RH Matjhabeng Private Hospital Pty Ltd for an indefinite period. The RH Matjhabeng Private Hospital is equipped to accept serious cyanide patients and the management thereof, in accordance with cyanide protocol. The procedure, Ambulance entry (to the Plant) in the event of an emergency, is in place to facilitate rapid movement of patients in and out of the Plant to the Hospital. Intasol will transport the emergency case to the entrance of the TSF where a map is available showing Ambulance meeting locations.



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

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 7.1**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

The procedure, Harmony 1 Plant: Cyanide Emergency Preparedness Procedure, and the Emergency Preparedness and Response Procedure are in place and up to date. The TSF COP Harmony Gold Mining Company Limited Free State Operations, Tailings Dams, Mandatory Code of Practice for Mine Residue Deposits includes the Slime Dam Emergency Procedure - Freegold 1 Plant. The procedure includes zones of influence, as well as emergency classifications and detailed plans for each emergency scenario. The scenarios include: - Section 4.2 High Rainfall Events, and Section 4.3 Structural Failure (Weeping, Sloughing, Cracking, Seepage)

The Cyanide Emergency Preparedness Procedure considers the following: -

- **Catastrophic release of hydrogen cyanide from storage, process or regeneration facilities** - section 12, page 13, Cyanide Emergency Scenarios and Response, includes the procedure, page 19 Multiple Cyanide Accident/Incident for when there are multiple cyanide casualties or impact to the environment from ruptured storage tanks, ruptured or leaking tanks, ruptured cyanide or slurry or solution pipelines. These will be the potential source of any catastrophic release of hydrogen cyanide. This includes the Plant reaction and subsequent response.
- **Transportation accidents occurring on site or in close proximity to the operation** - page 17, procedure for cyanide tanker incident / accidents. This includes the Plant control centre reaction and the subsequent response.
- **Cyanide releases during unloading and mixing** – on page 14, there is a procedure for Cyanide, Slime and Solution Spills as a result of ruptured storage tanks, ruptured pipelines, cyanide tanker spillage, etc. and on page 17, a procedure for cyanide tanker incident / accidents. This includes the Plant control centre reaction and the subsequent response.
- **Cyanide releases during fires and explosions** - page 13, procedure for Cyanide Structure or Equipment Fires.
- **Pipe, valve and tank ruptures** – page 14, procedure for Cyanide, Slime and Solution Spills as a result of ruptured storage tanks, ruptured pipelines, cyanide tanker spillage, etc.



- **Overtopping of ponds and impoundments** – the Slime Dam Emergency Procedure 1 Freegold Plant, covers zones of influence as well as emergency classifications and detailed plans for each emergency scenario.
- **Power outages and pump failures** - page 18, procedure for total power failure at the metallurgical plant.
- **Failure of tailings impoundments, heap leach facilities and other cyanide facilities** – page 16, a procedure for tailings dam incidents / accidents including dam wall failure, ruptured pipelines, slime spill, return water dam failure, hydrocyanic gassing and power failure (pumps), and the Slime Dam Emergency Procedure 1 Freegold Plant, covers zones of influence as well as emergency classifications and detailed plans for each emergency scenario.

Tanker Services is a certified cyanide transporter and is responsible for all end route emergencies as per the Transport Management Plan and the Cyanide Code requirements. In addition, page 17 of the Cyanide Emergency Preparedness Procedure makes provision for the plant control centre reaction and the subsequent response.

Specific response actions (as appropriate for the anticipated emergency situations) such as clearing site personnel and potentially affected communities from the area of exposure: Confirmed in the procedure. Page 13 of the Procedure covers evacuation. The use of cyanide antidotes and first aid measures for cyanide exposure is included under Cyanide Poisoning on page 15. Control of releases at their source: Confirmed in the procedure on page 3 and 5. Containment, assessment, mitigation and future prevention of releases is covered in the procedure on pages 3 and 5.

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

The workforce receives annual cyanide awareness training and cyanide first aid training and is involved in emergency drills, as appropriate. Any changes in the emergency procedures are communicated through the annual cyanide awareness refreshers and through the cyanide drills.

External stakeholders and potentially affected communities are made aware of appropriate cyanide emergency actions and responses through on-going dialogue. See 9.1 and 9.2 below. Dialogue includes the updating of relevant emergency procedures and action for the specific stakeholders.

The Hospital and ambulance service are contracted to provide their services to the Mine and are kept aware of changes through involvement in cyanide mock drills. Identified external entities are included in dialogue sessions. See 9.1 and 9.2 below.



The Reagent Handler, through her weekly cyanide facilities inspections, is responsible for ensuring that all cyanide emergency equipment is available and operationally functioning. The cyanide emergency cabinet checklists and the cyanide emergency trailer checklist, list all the available cyanide emergency equipment.

Communities have no role in the cyanide emergency plan. In the Cyanide Emergency Preparedness Procedure, Section 7. Emergency Procedures Quick Reference Guides, page 5, describes the roles of the medical facilities. The roles of medical facilities are detailed in the contracts with Matjhabeng Private Hospital and Netcare 911.

Agreements are in place with St Helena (ended in 2023) and Matjhabeng (commenced 2023) Private Hospitals and Netcare 911 for the transport and treatment of cyanide patients. The procedure, Ambulance Entry in the event of an Emergency, describes the process to follow during an incident to notify the ambulance, allow access and accompany patient to hospital. In the Backfill Procedure, the emergency response plan injury procedure, section 3.5 states "...arrange for ambulance entry with security personnel main gate" Backfill Operations were stopped in June 2022. Matjhabeng Private Hospital and Netcare 911 are involved in full cycle cyanide mock drills as per their contracts. Potential external entities (e.g. Police, fire services, and municipal and provincial authorities) that may be involved in emergencies are kept informed through meetings and discussions as detailed in 9.1.

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

X in full compliance with

- The operation is**
- in substantial compliance with **Standard of Practice 7.4**
 - not in compliance with

Basis for this Finding/Deficiencies Identified:

The Cyanide Emergency Preparedness Procedure, page 8, depicts a flowchart indicating the employee (by job description) that should be contacted in the event of various emergency scenarios. Page 12 contains all the contact telephone numbers for management, regulatory agencies, outside response providers and medical facilities that need to be contacted. The Slime Dam Emergency Procedure Freegold Plant, includes emergency contact information on pages 8 to 11 covering all TSFs for No 1 Plant.

The procedure describes the process when the SAPS (South African Polices Service) will be used to evacuate the affected communities, if required. It also states that employees will not disclose any information to the press or public. Only the Chief Operating Officer may release information. The Procedure regarding Communication with the Media covers the media communication process, section 3.1 Communication with the Media.

The Procedure to notify ICMI of any significant cyanide incident, is a new procedure. It reproduces the ICMI list of significant cyanide incidents and includes the requirement to report the incident within 24 hours of occurring, and send a follow up, after investigation,



within 7 days. There have been no ICMI reportable cyanide incidents since the last recertification audit.

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.

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 7.5**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

The Cyanide Emergency Preparedness Procedure, section 6 Decontamination and Rehabilitation, page 5, states that ferrous sulphate can be used to detoxify soils: -

" ...6.3 Soil can be detoxified by using ferrous sulphate. For 50 litres of 33% sodium cyanide use 20 kg (2.5:1) ferrous sulphates crystals. Once the cyanide has been neutralized the contaminated soil has to be dug up to at least a depth of 300mm and transported to the plant or an area that has been earmarked for the disposal of contaminated soil. Once the 300mm soil has been removed the soil remaining behind must be tested for cyanide contamination. If there are still signs of cyanide contamination another 300mm soil needs to be removed and the process repeated. If no cyanide contamination can be detected the area where the soil was removed must be filled with new soil considering, the natural contours of the area where the soil has been removed... "

" Ferrous sulphate is stored in a locked container in the cyanide area.

A requirement states that: - Ensure that the environmental spill procedure: Procedure Handling and Cleaning of Spills, is complied with. The section, Spillage on soil, describes the procedure in case of spillage onto soil, as well the treatment of the endpoint of decontamination.

No provision of alternative drinking water is necessary as drinking water is supplied by the municipal water distribution network sourced from outside the area.

The procedure, Handling and Cleaning of Spills, details the actions to be taken to clean up spills onto soil as well as into waterways.:

"...- Spillage into waterways: Section 7 Sodium hypochlorite, ferrous sulphate and hydrogen peroxide are all hazardous to aquatic life and should not be used to treat a cyanide release once it has entered surface water. This prohibition also applies to normally dry drainages since these may flow in response to precipitation and deposit residual treatment chemicals into downstream surface water.

- Section 8: This prohibition also would not be necessary in a situation where concerns with protection of human health outweigh the risk to aquatic life..."

The Cyanide Emergency Preparedness Procedure, section 6 Decontamination and Rehabilitation, includes the disposal of clean up debris and describes the use of ferrous sulphate.



In the Handling and Cleaning of Spills procedure, Section 6 states, "...Water samples must be taken at the point where the slime or solution enters the clean water system as well as above and below this point and analysed for the chemical that may be present in the slime or "dirty" water as well as uranium. It is vital that the necessary sample preparation measures are followed, when taking the samples, as required by the laboratory doing the analysis, to ensure the validity of the sample results. The results of these analyses must be forwarded to the Environmental and Group Radiation Managers..."

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

The Cyanide Emergency Preparedness Procedure, is reviewed every 2 years. (document control requirement).

A number of cyanide emergency drills were undertaken since the last recertification audit.

- A cyanide emergency drill was undertaken on 12 May 2022. The scenario was a splashing man down drill. The drill was from No 1 Plant to St Helena Hospital, using Netcare 911 for paramedic and ambulance services. Separate attendance list sighted. Photos were taken and stored on a computer.
- A mandown (splash) full cycle cyanide drill was carried out on 12 January 2024. A detailed minute-by-minute observation sheet was sighted, but there were no comments in the sheet. However, the Minutes of the Harmony One Plant Cyanide drill feedback meeting held on 12 January 2024 included a number of actions identified: - it was decided that roles should be allocated prior to the drill; training should be carried out on a regular basis; the cyanide emergency drill procedure needed to be reviewed; and Sasol would be approached about providing specialist cyanide emergency training.
- The No 1 Plant Emergency Team participated in a joint dangerous goods (cyanide) transport mock drill on 7 September 2023 involving Matjhabeng Disaster Management and Sasol to measure the preparedness of the emergency services and hospitals in the Matjhabeng area. The official feedback report is still awaited. However, No. 1 Plant prepared its own notes which indicated areas of improvement. These included the following: - the municipal fire department took excessive time to don PPE and entered the scene without checking wind direction; the Disaster Management and Central Command arrived late; Police representatives entered the inner zone without proper chemical PPE; nearby bystanders and house occupants were not evacuated; government ambulances

lacked cyanide PPE, there was poor communication amongst rescuers; and command structures were slow in being established.

- The minutes of a cyanide splashing drill feedback meeting were sighted. The drill was held on 23rd February 2023. Areas of improvement include: - adjusting the cyanide alarm in the milling section because it was not sufficiently audible to be heard, and checking the updating of the training for the Emergency Team.
- The feedback meeting minutes for a cyanide drill held on 12th January 2024 (drill held on 12 January 2024) were sighted. The scenario was a cyanide release caused during maintenance activities where a pipe was dislodged causing a release. During the feedback meeting, it was decided to hold weekly training for the emergency response team, the alarm at the Ore Reception needed to be adjusted as it was inaudible, and a review of the emergency response procedure was agreed to.

In the Cyanide Emergency Preparedness Procedure, Section 3.7 Update and Review of Emergency Procedure, it states: -

“...This procedure will be reviewed as follows:

- * After a cyanide incident or accident has occurred
- * After a cyanide drill has been held and changes are required
- * Biennially
- * After process modification which may affect the use of cyanide
- * After modification to the safety equipment e.g. safety shower, safety alarms, etc....”

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

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

All plant personnel inside the plant fence (including security and Intasol, the TSF contractors) are trained in basic cyanide awareness. The training is provided using a video and PowerPoint slides. The training material was sighted and includes ICMI requirements. Cyanide induction training is done through e-learning. The pass mark is 100% and everyone must keep repeating the e-learning training until they attain 100% pass. Sighted plant cyanide induction training matrices for 2021, 2022, 2023/2024. Sighted Contractor training matrix (including all contractors, security and Intasol, the TSF contractor). Contractors needed for cyanide induction training are emailed or phoned. If no responses, contractors are blocked from entering the Plant.

A flagging system is used to indicate expired training. On the spreadsheet-based matrix, the cell of the individual becomes yellow a week before expiry and the cell turns red on expiry. The plant cyanide induction training matrix is sent to the foremen on the first week of each month, indicating who is required for training. A weekly Monday meeting is also held with the foremen, indicating who is required for training that week.

Backfill staff received induction training until the Plant was decommissioned. The backfill operation was stopped in July 2022.

Refresher training is done annually, based on schedules using the training shift system (also used for routine update training) The use of matrix with flagging system was verified to ensure all staff are covered. Electronic records are retained for 40 years on the plant, after which the records are sent to the central archive.

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

X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:

The training matrix was also available during the previous certification audit including the employee names and all task procedures required for training. The training matrix is being updated with the new revised SOPs (Standard Operating Procedures). Employees are trained using the SOPs.

A Training workbook, is made up with the training that each employee needs to do to be competent in his job, and continues to be used. An example of a workbook for a Section Supervisor - Gold Plant was reviewed. The book includes: -

- 1 - Workbook and administration,
- 2 - Training courses,
- 3 - Self-Study Requirements,
- 4 - Practical Exposure,
- 5 - Acting as Section Supervisor,
- 6 - Course Planner, and
- 7 - Training performance Assessment.

Training elements identified for each job are detailed in the workbooks issued in consultation with the Foreman. SOP competence required by employees is identified in the task training matrix. The SOP is reviewed by the employee, and his foreman will undertake on-the-job training and counselling and then the employee will be assessed and checked using Planned Task Observations (PTOs).

The training establishment is formally accredited to ISO (International Organisation for Standardisation) 9001 (Quality Management Systems). Eunice Kumalo is Acting Training Assessor and her Qualifications include: - Facilitate learning using a variety of

given methodologies, Unit Standard 117871 certificate No AQUACD064/19 dated 20 November 2019, Course to conduct outcomes-based assessment No ISCA/15/07753, (certificate No AQUACD042/19 dated 25 September 2019) Training is provided by Aquarius Skills Solutions. Angelina Mantoa Thebe is a Training Assessor with a Certificate to conduct outcomes-based assessment No ISCA/15/07753, Letter of Competence from Maccauvlei Learning Academy on the course coach the learner course code CTL0517 20 to 24 November 2017, certificate number CTL0517/05 18 March 2019.

All employees are trained before being allowed to work on a cyanide section. unsupervised. Use is made of the e-learning system. On-the job training by the foreman is also undertaken. The Shift Foreman assesses the trainees. The Training Department will assist the Foremen with doing PTOs. The e-learning system uses multiple choice questions to test competency and knowledge. An employee is first trained offsite by the Training Department. When confirmed competent, he or she is handed over to a section foreman in the Plant who will provide further on-the-job training and undertake PTOs until the employee is sufficiently competent to work on cyanide, without direct supervision.

A PTO system is in place and if deviations are identified by a PTO, or informal observation, specific on-the-job re-training is given. All transferred employees will be given an assessment before being allowed to work on the section as per managerial instruction. (Sighted Memo PMI 01-12-HI.) Training record cards and refresher training, (Memo PMI 05-12-H1) documents are to be completed during the external and internal transfer of employees.

E-learning multiple choice tests for the various modules are conducted. PTOs are used for on-the-job competency evaluation as per schedule. Sample PTOs were reviewed–

2021 - Liquid Cyanide Offloading - 14 April 2021, being observed -- Doreen Mahlatsi, observer - P Pieterse - compliant. Liquid Cyanide Offloading - 7 April 2021, being observed - I Molutsi, observer - P Pieterse - compliant.

2022 - Liquid Cyanide Offloading - 20 April 2022, being observed - Doreen Mahlatsi, observer - P Pieterse - compliant. Liquid Cyanide Offloading - 6 April 2022, being observed - I Molutsi, observer - P Pieterse - compliant.

2023 - Liquid Cyanide Offloading - 24 May 2023 - Doreen Mahlatsi, observer - P Pieterse - compliant. Liquid Cyanide Offloading - 10 May 2023, Molutsi, observer - P Pieterse - compliant.

Records are retained for 40 years (10 years on the plant) after which the records are sent to the central archive. Records contain the required information.

The Intasol (TSF contractor) Training Matrix hardcopy was sighted. The matrix included Intasol specific induction and training. The Safe Working Practice (SWP) for each set of tasks is used as the base training material. The training matrix includes: - training matrix general (e.g. induction, medicals, first aid, mine licenses, and legal liability), Risk assessments, including baseline and issue-based, Intasol SOPs (Safe Operating Procedures) including all tasks required to be carried out on the TSF, and the names of the staff. The matrix is kept up to date, and a PTO Schedule, including tasks and names, is maintained. Training is given by experienced safety representatives, the safety officer, and supervisors.



All new employees are given a site-specific cyanide awareness induction by Harmony and Intasol training is based on on-the-job task training, using Safe Work Practices (SWPs) and PTOs. Annual refresher training on operational tasks using the SWPs is conducted and the schedule was sighted in the training matrix.

Intasol use PTOs to evaluate effectiveness of TSF task training. Annual refresher training is scheduled as per the training matrix and evaluated using PTOs. PTOs for 2022 were sampled: -

Wall ditching - being observed: M Majodino, Observer: S Prinsloo, Date of observation: 10/08/2022. Satisfactory with improvement suggestions. Ditching with Tractor -being observed: M Farku, Observer: S Prinsloo, Date of observation: 20-09-2022. Satisfactory with improvement suggestions.

Records are retained for 10 years on the plant after which they are sent to the central archive for 40 years. Records contain the ICMI required information. Training records of the interviewee from Intasol were sampled.

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

X in full compliance with

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

not in compliance with

Basis for this Finding/Deficiencies Identified:

All employees are trained on how to respond to cyanide emergencies (exposure or spills). In addition, A fully trained dayshift emergency team is also trained in additional cyanide response, and is in place to react to cyanide emergencies during day shift. If cyanide incidents occurred on shifts other than the day shift, and shift staff could not deal with the incident, the emergency response team would be called out. In the training matrix: additional training requirements for the emergency team are detailed under: "Emergency Team" page in the cyanide training matrix. This includes: - Advanced firefighting, gas monitor, and SCBA (Self Contained Breathing Apparatus) sets. The 2023/24 training matrix for 15 emergency responders was sighted. This training is refreshed annually. The Cyanide Emergency procedure states that the Emergency Response Team will be trained at least in the following: -

- Standard Refresher Training for plant personnel
- Cyanide Training
- First Aid Training
- Hazard Identification
- Evacuation Chair Training
- Use of the Drager Gas Monitor
- Use of a SCBA Set
- Use of the AED (Automated External Defibrillator) Set
- Use of a Stretcher



- **Basic Fire Fighting**

After hours shifts receive induction training including cyanide first aid. Routine drills are held, which form on-the-job training for emergency response. Formal drills to test the emergency procedure for cyanide first aid treatment are done on a quarterly basis and the complete response chain first aid, ambulance and hospital is audited on at least an annual basis and action taken where appropriate. Cyanide drills are the primary training tool used to train the cyanide Emergency Response Plans. The use of the necessary response equipment is covered in the cyanide training video and the drills.

The Cyanide Emergency Procedure is presented to all new and other plant employees attending induction or refresher training at the Harmony 1 Plant's training centre. All contractors working for longer than three days at Harmony 1 Plant also undergo training in the cyanide emergency procedure.

An Agreement was in place with St Helena Hospital and Netcare 911 for the transport and treatment of cyanide patients. There is a new contract in place with RH Matjhabeng Private Hospital. The Agreement between Harmony Gold Mine and RH Matjhabeng Private Hospital Pty Ltd was signed by the Hospital Manager, dated 13/11/2013 for an indefinite period. The RH Matjhabeng Private Hospital is equipped to accept serious cyanide patients and the management thereof, in accordance with cyanide protocol. Harmony to arrange a maximum of two cyanide drills per year and Harmony will inform the Hospital Manager of the drills. Training of the Medical Staff will be facilitated by Harmony. The plant also has a procedure, Ambulance entry (to the Plant) in the event of an emergency, to ensure that any casualty can be accessed and removed as quickly as possible.

Records are retained for 10 years on the plant after which sent to the central archive for 40 years. Records contain the ICMI required information.

9. DIALOGUE AND DISCLOSURE: Engage in public consultation and disclosure.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 9.1**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

Harmony Target Plant and No 1 Plant work together on stakeholder dialogue and the following stakeholders have been identified: All Emergency Departments, Communities around the Mining Areas, farmers around the mining areas and livestock owners and cattle herders, Boiketlong village, and Brand 5 hostel. Public communication flyers have been posted to all stakeholders.



Various meetings to discuss the management of cyanide emergencies in the Matjabeng municipality area have been held: -

- 13 and 14 September 2022 (chaired by Katlego Moalusi and Rendani Mikosi – No 1 Plant);

- 8 and 9 December 2021 (chaired by Cyril Radebe (Target Plant Process Manager), and Masala Tshamamo (Environmental Manager),

- 17 and 18 November 2020 (chaired by Johnny Botha (No 1 Plant Manager), Cyril Radebe, Teboho Tlhobo (Plant Manager), Irene Nadunga - Environmental Manager), to the Emergency Services, including SAPS (South African Police Service) flying squad, Matjabeng Fire and Rescue, Paramedics, One Life 911, ER24, Netcare 911, St Helena Hospital, EMS (Emergency Management Services), RH Matjhabeng Private Hospital (Previously Ernst Oppenheimer Hospital), and Environmental Health Practitioners.

Feedback notes and questions by the community were recorded.

Minutes and notes from the Harmony Gold Mine Cyanide Community Awareness, Air emissions Licence Environmental Consultation in 2022 were reviewed, where 100 people attended. Public communication flyers dated 30 August 2022 were posted to the stakeholders, copies of which were sighted.

A presentation, Harmony Gold Mine Cyanide Awareness Presentation, used for communication to the communities was reviewed. The presentation includes: Production, Transportation, Training, Dialogue, Operations, and Emergency Response.

On the 8th December 2021, a cyanide awareness discussion was conducted with cattle herders with cattle grazing outside Harmony One Plant. K. Moalusi and A. Thebe highlighted the dangers of livestock drinking water at the return water dam.

Mr J Ramaima conducted a community outreach on 19 April 2022 whereby he also spoke to cattle herders about the dangers of cattle grazing near plants and tailings facilities.

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

X in full compliance with

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

not in compliance with

Basis for this Finding/Deficiencies Identified:

Public flyers in English and Sesotho on Cyanide Management at Harmony One Plant were posted to all stakeholders. Smaller focus groups, such as the cattle herders, were involved in a discussion in the Sesotho language, explaining cyanide management at No 1 Plant.

No cyanide accidents or incidents have occurred since re-certification.

The Harmony ESG (Environment, Safety and Governance) report of 2021 contains a section on the Cyanide Code under the section, Tailings and Waste Management, on page 41. The Harmony Annual report of 2021 includes under the section, Environmental, Social and Governance (ESG), environmental and safety performance with references to



cyanide. The Harmony ESG report of 2022, dated 30 June 2022, includes multiple references to the Cyanide Code in text and tables. The website reference <https://www.har.co.za/22/download/HAR-ESG22.pdf>

Fatal or mass incidents (cyanide or otherwise) will be handled via the Harmony Corporate Communications Department. Newsflashes are distributed within the Company via e-mail. Incidents are reported to the Department of Mineral Resources and Energy (DMRE) by mine management. The DMRE does not report regularly on cyanide or other incidents, but may report selectively on repeated, critical or noteworthy incidents. Sasol and Tanker Services are responsible for releases as a result of tanker incidents en route to the mine. Any cyanide releases that might occur would be reported in terms of Harmony Group Communications Policy and reported after investigation in the annual reports of ESG reports.

Mine releases (cyanide or otherwise) are reported to Department of Water and Sanitation (DWS) and Department of Environmental Forestry and Fisheries (DEFF) and National Nuclear Regulator (NNR) following an investigation by the Mine Environmental and Occupational Hygienist Department.

