

***INTERNATIONAL CYANIDE  
MANAGEMENT INSTITUTE***

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

***Summary Audit Report***

***Harmony Gold Mining Company Ltd  
Target Gold Plant  
South Africa***

***27<sup>th</sup> November – 1<sup>st</sup> December 2023***

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



Name of Operation: Target Gold Plant

Name of Operation Owner: Harmony Gold Mining Company Ltd

Name of Operation Operator: Harmony Gold Mining Company Ltd

Name of Responsible Manager: Mr Cyril Radebe, Plant Manager

Address: 1 Buffalo Street, Allanridge

State/Province: Free State

Country: South Africa

Telephone: +27 57 452 4455

Fax: +27 57 452 4458

E-Mail: [Cyril.Radebe@Harmony.co.za](mailto:Cyril.Radebe@Harmony.co.za)

**Location detail and description of operation:**

Target Mine is one of the mines owned by Harmony Gold Mining, acquired from Avgold in 2004. The Mine is located between Klerksdorp and Welkom, on the Witwatersrand basin, in the Free State Province of South Africa.

Target Gold Plant was designed and commissioned in November 2001 to treat ore from Target 1 Shaft. The Plant was designed to treat 105,000 tons per month with the potential to expand to 160,000 tons for future demand. Currently, the Plant treats ore from Target 1 shaft and Waste Rock dump material, with the majority being from Target 1 shaft material. The Plant was modified by installing a run-of-mine (ROM) mill to replace the two-stage milling circuit, for expansion purposes and due to higher steel ball costs. The Gold Plant uses liquid sodium cyanide, supplied in bulk tankers from Sasol South Africa and stored in dedicated bulk cyanide storage tanks.

The WAD (Weak Acid Dissociable) cyanide concentrations in the milling circuits are less than 0.5 mg/L. Hence, the milling circuit is not deemed a cyanide facility.

Ore is treated by Semi-Autogenous and Run-of-Mine milling. The mill product is directed to the thickener for densification, followed by leaching through 7 mechanically agitated leach tanks. The leached ore gravitates to the Carbon In Pulp (CIP) circuit, where activated carbon is added from the last tank. The pulp moves downstream while the carbon moves upstream. Loaded carbon is then

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removed from the first adsorption tank and pumped to the elution circuit. Carbon is then acid washed with hydrochloric acid and eluted with a solution of sodium hydroxide and sodium cyanide. Gold is recovered from the elution solution using electrowinning cells. The electrowinning sludge is dried and smelted in the induction furnace, and then dispatched to Rand Refinery for refining. The eluted carbon is pumped to the regeneration kiln, and then to the CIP circuit. The tailings from the CIP circuit are screened to remove fine carbon, and then pumped to the tailings dams (TSF1 and 2) for storage. The Plant uses potable water, return water from tailings dams, and water from Target 1 shaft.



*Auditor's Finding*

**This operation is**

in full compliance

**X in substantial compliance** \*(see below)

not in compliance

with the International Cyanide Management Code.

\* This operation was found in substantial compliance with the Cyanide Code based on the audit findings discussed in this report under Standard(s) of Practice 4.8. The Corrective Action Plan to bring the operation in substantial compliance into full compliance is enclosed with this Summary Audit Report and refers to Standard of Practice 4.8. The plan must be fully implemented within one year of the posting of the Summary Report on the Cyanide Code website.

Audit Company: Eagle Environmental

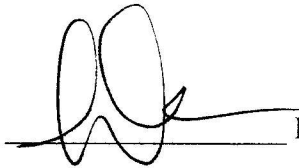
Audit Team Leader: Arend Hoogervorst

E-mail: [arend@eagleenv.co.za](mailto:arend@eagleenv.co.za)

Names and Signatures of Other Auditors:

Name: Dawid M. L Viljoen  
Mine Technical Auditor

Signature



Date: 16/07/2024

Dates of Audit: 27<sup>th</sup> November – 1<sup>st</sup> December 2023

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.

Target Gold Plant

Facility

Signature of Lead Auditor

17/07/2024  
Date

Target Gold Plant

Signature of Lead Auditor

3<sup>rd</sup> July 2024

*Auditor's Findings*

***Principle 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:*

A Harmony Group cyanide supply contract with Sasol South Africa (Pty) Limited (Sasol) is in place. Target Gold Plant only purchases liquid sodium cyanide from Sasol. Sasol is a certified cyanide producer and was certified fully ICMI (International Cyanide Management Institute) compliant on 7 March 2022. As the cyanide production facility is fully ICMI certified, and Target only purchases cyanide from Sasol, the principle is fully compliant.

***Principle 2. TRANSPORTATION:***

***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.***

***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 of the Target Gold Plant sodium cyanide supply chain: Sasol, the producer, and Tanker Services Food and Chemicals/Imperial Logistics (Tanker Services), the bulk liquid cyanide transporter. Tanker Services were ICMI-recertified on 1st April 2022. The chain of custody document package relating to cyanide deliveries made to Target was sampled for 6 March 2023 and 25 October 2021. The chain of custody document package included: - a Harmony purchase order, a Sasol Tax Invoice, a Sasol delivery note/dangerous good declaration, a Sasol Delivery Note, a Sasol Certificate of Analyses, and a Tanker Services delivery note.

***Principle 3. HANDLING AND STORAGE:***

***Protect workers and the environment during cyanide handling and storage.***

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

**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:*

Previous certification audits provided evidence that civil and chartered professional engineers signed and approved technical drawings that the cyanide unloading and storage facilities were designed and constructed according to sound and accepted engineering practices. These drawings are still accessible. Structural Safety Audits of Target Plant, dated March 2022 and February 2021, undertaken by a professional Engineer, indicated no issues at the cyanide offloading and storage facility. An inspection audit of the cyanide offloading facilities by Sasol, dated 11 October 2023 by Sasol Technical specialist, Mosala Mokoena, resulted in a 100% compliance finding.

During the site inspection of the reagent-strength cyanide offloading and storage facilities, it was confirmed that the facilities are situated at the far end of the Plant, away from people. No surface water streams are close by and, as such, no potential cyanide release risk exists. It was verified that an HCN (Hydrogen cyanide) gas monitor is installed on top of the tanks and one in the bund area to warn of HCN gas presence. During the site inspection, it was verified that the Tanker Services bulk tanker is parked and offloaded on a concrete slab that drains into the cyanide storage bund. The cyanide storage tanks are located in an open-air environment, on concrete and within concrete bunds that prevent seepage to the subsurface. As secondary containment, the integrity of the high-strength cyanide concrete bunds is checked by regular inspections and annual bund flood tests.



Cyanide storage tanks have level indicators, warning lights, and audible alarms that activate at 85%. The Cyanide Offloading procedure requires the Offloader to immediately close offloading air (supplied by the plant compressors) and to stop offloading at alarm activation. High-level alarms sound and are visible on the control room's SCADA (Supervisory Control and Data Acquisition) system. The procedure also requires checking tank levels, before offloading of a tanker commences, to confirm that there is sufficient space in the tanks to accept the full bulk tanker load. The cyanide alarm systems are included in the DMS (proprietary name) PMS (Planned Maintenance System) system as a weekly planned inspection by the instrument technician. The liquid cyanide storage tanks are equipped with ventilation pipes at the top of the tank to prevent HCN gas build-up. The cyanide liquid storage area is within the access-controlled plant security area, and the facilities are fenced and locked with access to authorised persons only.

The liquid cyanide storage facilities are placed next to compatible lime storage. The cyanide tanks are placed inside a bund to prevent spillages from coming into contact with other chemicals. The compatible Sodium Hydroxide storage tank is placed in the same bund as the cyanide storage tanks.

***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:***

The Plant only uses liquid sodium cyanide, delivered by bulk tanker, and unloaded directly into cyanide storage tanks. The cyanide transporter is responsible for cleaning any cyanide residue from the hose connections and couplings on the delivery tankers following offload events. No other cyanide storage containers are used on the site, and no solid sodium cyanide is used on site. The Procedure Liquid Cyanide Offloading—Accidental Release Measures, includes measures for timely cleanup of any cyanide spills during cyanide offloading activities, such as might occur due to equipment failures or other inadvertent events.

With regard to the operation and maintenance of all hoses, valves and couplings for unloading liquid cyanide, the offloading of cyanide procedure covers air supply valves, tanker valves, storage facility valves, and coupling of flanges. The hoses, valves and couplings on the Plant off-loading facility form a part of the inspections for the site PMS (Planned Maintenance System). The transporter is responsible for maintenance of the valves, hoses and couplings on the bulk delivery tanker. The task sequencing of opening and closing of valves is covered in detail. The timely cleanup of any spills of cyanide



during the transfer of liquid cyanide from tanker trucks is also included in the offloading of cyanide procedure.

The liquid cyanide offloading procedure refers to the Buddy Procedure and requires a second person to observe the offloading process. PPE (Personal Protective Equipment) requirements are specified in both procedures. Red dye is added by Sasol, the cyanide producer, at the production facilities before delivery to the Target Gold Plant. The Sasol SDS (Safety Data Sheet) was reviewed during the site inspection and included the liquid sodium cyanide's colour as light to dark red. This is to provide for clear visual identification and clear differentiation from other solutions or rainwater that may be present.

***Principle 4. OPERATIONS:***

***Manage cyanide process solutions and waste streams to protect human health and the environment.***

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

**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:***

Target Gold Plant has 74 cyanide-related procedures in place, including process and engineering procedures. Some of the procedures are also applicable to the TSF. The procedures cover Engineering and Plant Operations. Procedures including PPE (Personal Protective Equipment) and pre-work inspections requiring **Stop, Look, Assess and Manage (SLAM)**.

TSF (Tailings Storage Facility) operations are guided by the COP (Code of Practice) 2, a Mandatory Code of Practice for Mine Residue Deposits, dated 24 November 2023, for Target Plant. The Intasol (TSF Contractor) Baseline Risk Assessment for Harmony Target Plant TSF, dated 11 November 2023, and the Intasol Tailings Operational Manual, Harmony Target Plant, also form a part of operations management. Within the Intasol Operational Manual are a series of TSF task-specific procedures. The TSF is also managed using quarterly inspections and meetings, including Professional Engineers, and annual audits. Legal and design engineering requirements include minimum TSF freeboard for 1:50 and 1:100 year 24-hour rainstorms. A plant procedure, high cyanide levels in residue slime, also specifies WAD cyanide levels should not exceed 50ppm in the tailings tank.

Plant operational inspections are conducted daily and include pipes, pumps, valves, bund walls and floors, the general cyanide storage area, and the low-strength cyanide areas. A



DMS (proprietary name) PMS (Planned Maintenance System) system is in place. Most of the inspections are scheduled by work orders from the DMS system.

At the TSF, daily inspections are carried out, which include monitoring for bird mortality, site safety declaration, inception report, delivery lines, valves, TSF conditions, solution trenches flowing to the lined dam, vertical freeboard, and rainfall. Daily TSF pipeline inspections are conducted by Intasol (the TSF contractor) twice a day. An after-rain inspection procedure is in place, which requires inspection after rainfall of more than 30 mm. The TSF pipelines, pumps and valves form part of the DMS planned maintenance system, and are subject to periodic planned maintenance inspections. TSF monthly dashboard reports (A dashboard report is a way of displaying various types of visual data in one place. Usually, a dashboard is intended to convey different, but related information in an easy-to-digest form.) include actual Freeboard (including targets), tonnage deposited, drain flow, piezometer readings, down time, feed densities and rainfall.

Specific, detailed inspections are undertaken as follows: -

### **Tanks**

All leach and CIL (Carbon in Leach) tanks are rubber-lined. These tanks are listed on the DMS (proprietary name) PMS (Planned Maintenance System) system and have annual inspections covering leaks, corrosion and integrity. Annual inspections of the rubber lining are carried out, and the rubber is also spark tested. The sequencing of annual inspections may be varied if there are tanks that need repair (Repair takes priority, and other inspection and maintenance work may be undertaken on the repaired tank, at the same time as it is empty.) There is an ongoing tank maintenance schedule, which is revised when tanks need to be repaired. There are no tanks holding cyanide solutions at the TSF.

All tanks are also visually inspected annually by a boilermaker for structural integrity, signs of corrosion and leakage. Leach and CIL tanks that are on ring beams are subject to RBI (Risk Based Inspection), the details of which can be found under Standard of Practice 4.7 below. All tanks are subject to annual thickness testing. This testing is carried out by external specialist contractors. Samples of Target Plant Thickness Testing on Pipelines and Tanks, for 7, 8, and 9 November 2023, covering cyanide, residue pipelines and tanks, and Thickness Testing on Pipelines on 7, 13, and 16 October 2020, covering cyanide, residue, pipelines and tanks, were sighted and reviewed.

### **Secondary Containments**

Bunds (secondary containments) are included in the operational inspections of the low and high-strength cyanide storage area and are done, initiated by a works order to Operations. Daily Inspections in 2023 and 2022 were sampled. Inspections include checking bund floors and walls for damages and cracks. Annual flood tests are carried out on the cyanide bund.

### **Leak Detection and Collection**

The leach tanks are equipped with leak detection holes in the ring beam. These are inspected as per Task Based Risk Assessment (TBRA) showing the remark, no leaks on any tank. The Boilermaker Monthly Inspection of the Leach Tank Assembly, Leak Detection, was sighted. It checked leak detection holes and included inserting 10mm rods to a depth of 2 metres to determine if the holes were open or had collapsed. The sample inspection for February 2023 confirmed all was in working order and there were no leaks.

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### **Pipelines, Pumps and Valves**

Operational inspections are conducted daily as per work orders. DMS (proprietary name for pump type) pumps, pipes, flanges, bund walls and the cyanide storage area are included in the Daily Inspection of the Low and Light Strength Areas. Sampled inspections on 22 November 2023, 27 November 2023, 8 June 2022, and 17 December 2021.

### **Ponds and Impoundments**

TSF pond freeboard is measured monthly by datum poles (Sampled reported results in the Intasol dashboard for 30 October 2021, 30 June 2022, and 30 October 2023.) The report includes freeboard status and detail, piezometer data, pool depth, rainfall density and downpours. The Jones and Wagener (Engineers of Record) quarterly reports and the Annual Reports for 2021 and 2022 were sampled and confirmed to include freeboard data.

Return water dam levels are recorded and measured by the Business Unit Leader. Inspection forms for Swartpan, SDR (Slime Dam Return), and the plastic-lined dams for 7 September 2022 were sampled.

Inspection frequencies range from twice per day, daily, weekly, two-weekly, monthly, annually, and two and three yearly, according to specific requirements. This is deemed adequate to assure and document cyanide 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 inspection frequencies are daily, monthly, and quarterly. The inspections are deemed appropriate frequencies sufficient to assure and document that the TSFs are functioning within design parameters. Inspection checklists contain the date of the inspections and the name of the inspector. Faults are recorded on a works order where the deficiency, date created, and date of corrective action are recorded. Once the corrective work is completed, the artisan hands in the details of the work order repair to the Planned Maintenance Foreman, who arranges for the data to be loaded onto the DMS electronic system and database.

The DMS Planned Maintenance Computerised System is in place, fully implemented, and populated. The system was confirmed to be in place by the Planned Maintenance Foreman. An electronic review of the DMS was undertaken, and the various records and inspection templates were reviewed on-screen. Although not classified separately, all critical cyanide equipment is loaded on the DMS system. Thickness testing is conducted on pipes and tanks as part of the condition maintenance program. Thickness testing records were sighted. Deviations are identified by the operational or engineering inspections. Work orders are issued to the maintenance department, which completes the repairs. Completed work orders are entered electronically on the DMS system. All work orders are filed centrally. Currently, there is an effort to switch to a paperless function with electronic signatures and the use of iPads to record information. This is not yet fully functional. Safety shower inspections are included in the DMS. The tanks on ring beams in the Plant are part of a Risk Based Inspection (RBI) system. Bunds are included in the DMS system as part of a works order for operational daily inspections of the Low and High Strength Cyanide areas. The weekly inspection and testing of the Cyanide alarms in the elution area is also on the DMS.



The Plant is designed to contain releases during any power failure. Bund areas and sump pumps are in place to contain and return spillage to the process. Minimal gravity flow occurs in the Plant, with most of the slurry being pumped, minimising runoff and spillage during power failures. No emergency power requirements to prevent overflows and releases were identified. No emergency power is required at the TSF complex. The complex has sufficient spare storage capacity available in the return water dam, and in the form of extensive evaporation dams linked to the return water dam.

The Plant has a "Management of Change (MOC)" Managerial Directive, requiring sign-off by Environmental and Safety Officials. An MOC exercise document sighted was carried out for the treatment of medical (including cyanide) emergencies moved from St Helena Hospital to RH Matjhabeng Private Hospital, dated 12 July 2023, and signed by the Safety and Environmental Officers.

No scenario was identified where temporary closure of the Plant is required to restore the water balance as per Probabilistic Water Balance requirements. Procedures are in place where a plant shutdown is required due to breakdowns and monthly planned shutdowns, including mini-risk assessments before the work is done. In the Cyanide-Related Emergency Response Procedures Harmony Metallurgical Plants, Section 11.5 (Procedure TGP 92) includes non-standard scenarios such as: -

- Process upsets & downstream effects;
- Incorrect sampling procedure;
- Offloading after hours by incompetent person;
- Incompetent control room operators;
- Ores and grade fluctuation;
- Control instrumentation failure, i.e. Alarms, cyanide monitor, WAD analyser, level transmitters, flow meters and/or alarm conditions ignored; Auxiliary systems failure, i.e. compressed air and/or electrical outage;
- Bulk storage, dosing pumps, valves, piping and/or flange rupture;
- Loss of key and competent personnel;
- Incorrect procurement and supply of sodium cyanide;
- Civil unrest, legal actions and labour unrest; and
- A Pandemic.

The Lead Auditor and Mine Technical Auditor deem that section 11.5 of TGP 92, adequately addresses the requirements of 4.1.5 regarding abnormal stoppage scenarios. The procedure, Stopping and Starting of Harmony Target Plant Procedure, can be used as a cyanide management contingency procedure for non-standard operating situations.

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

**X in full compliance with**

- The operation is**
- in substantial compliance **with Standard of Practice 4.2**
  - not in compliance with



not subject to

*Basis for this Finding/Deficiencies Identified:*

Target Plant has a Cyanide Optimisation procedure in place. The cyanide optimisation program was updated in September 2023.

Testwork Reports for Target Plant done on gravity recoverable gold were sighted. Tests were done by Maelgwyn Laboratories. Their Report, “Harmony: Target 1 Shaft, December 2020, composite sample tests”, concluded that the composite sample showed the sample was predominantly quartz with trace amounts of muscovite, pyrophyllite, chlorite and pyrite. Diagnostic leach tests were done by Maelgwyn Laboratories in April 2022, which indicated that 90% gold can be recovered by cyanidation and 5% is Preg robbing. Bottle roll tests are done at the Harmony Laboratory on a regular basis. Test results on Tailings re-leach Leach on 1 October 2022 and July 2022 were reviewed. Bottle roll tests from Harmony Laboratory of September 2023 and Free Gold Chemical Laboratory Diagnostic Leach Values (g/t Au – grams per ton Gold) were also reviewed. During the site inspection, it was confirmed that process control measurements are taken on shift. During the audit, the metallurgist was interviewed, and he confirmed that he reviews all metallurgical testwork results and makes recommendations regarding process optimisation during the short-interval meetings. This includes relevant cyanide operating parameters.

Cyanide dosing is controlled by measuring the cyanide in leach tank 1 using a TAC 1000 online analyser. Cyanide addition is controlled by a flow control valve/flow meter/ return line system. The feed is controlled using a ratio control feed forward control to the flow control valve with feedback control from the TAC 1000 analyser. Morning meetings (Short Interval Control) include cyanide dosing discussions using graphs, and remedial action is taken immediately.

*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:*

There is a spreadsheet-based probabilistic water balance (PWB) model covering the Plant and the TSF in place. The water balance is updated monthly with actual data, which was confirmed electronically by viewing the 2021, 2022 and 2023 spreadsheets. Specifically, the months of August 2022 and August 2021, and January 2023 and October 2023, were sampled and reviewed. The model takes into account the uncertainty and variability inherent in the prediction of precipitation patterns.

It was confirmed in the spreadsheet that the following items are included:

- Tailings deposition rates, including the Backfill Plant (when operating)



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- Monthly evaporation rates
  - Rainfall (actual)
  - Design rainfall 1:50 (113mm) and 1:100 (128mm) year 24-hour events
  - TSF Interstitial water
  - Seepage
  - Return water dams and other TSF dams' volumes
  - Design surface areas of TSF and water dams

Rainfall is measured using rain gauges at the TSF close to the Plant and recorded by Intasol in their daily log books. Evaporation rates are obtained from historical data from 1969 to 2009 (source: National Dept of Water Affairs & Sanitation) and applied on a month-specific basis.

The TSF is of the paddock type, and no run-on from up-gradient occurs to the TSF itself. The new return water dam walls are raised to prevent run-on. The Mine is in a hot climate south of the equator, which does not experience accumulation of precipitation after meltdown of freezing conditions. Seepage losses are included in the model as a standard assumption of 2.5%.

Power outages do not affect the operation because the TSF is operated with sufficient freeboard to contain stormwater during rain events. The PWB modelled the various rainfall events, and the total return water and evaporation pond capacity (including the operating levels) is sufficient to prevent overtopping in case of power failures during rainfall events. A scenario can be modelled to simulate a power outage during a rainfall event. Dam overtopping calculations were sighted, and no overtopping is indicated for the 1:50 and 1:100-year storm events. Water will only be released to the environment from the Swartpan, and this scenario did not indicate such a risk using the 1:50 or 1:100-year storm events. There is also no normal discharge to surface water. Phreatic surface is used to evaluate the dam stability in the Jones and Wagener annual report. Phreatic levels are reported monthly in the Intersol Dashboard reports and incorporated into the model.

The COP 2 Mandatory Code of Practice for Mine Residue Deposits for Target Plant requires Inspection by Mine Personnel. Inspections carried out include: -

- Intasol daily inspection logbooks
- Monthly TSF inspections, reports
- Quarterly inspection and reports

Freeboard is measured monthly using datum poles, and further surveyed. The Swartpan, return water dam, and plastic-lined dam levels are measured weekly, and the evaporation pond walls are inspected to manage the risk of overtopping. Sampled inspection reports for 7 September 2022 and 22 November 2023. The PWB model is used to establish and modify the Swartpan operating level, as necessary. The daily, monthly and quarterly reports, including the freeboard, and the Jones and Wagener annual reports confirming measurement and review of freeboard, were sampled and reviewed. The Quarterly Jones and Wagener reports, meetings and minutes evaluate the required freeboard needed to prevent overtopping during the design storm events. The total capacity of the return water pond and evaporation pond system is more than adequate to contain the design storm event as per the water balance model.

TSF rainfall data is obtained daily from Intasol for inclusion in the PWB. The Intasol monthly report includes the daily rainfall data. The Plant and TSF are close by, and thus,

the rainfall does not differ significantly between the Plant and TSF. The daily rainfall data from Intasol in the Dashboard and the inspection log books was sighted and sampled; the Quarterly Jones and Wagener reports, meetings and minutes review the rainfall, which is considered in the freeboard reviews.

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

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

The first compliance control point used by the Plant is the residue transfer tank system, where an online WAD 1000 analyser has been used since 2009. Check samples are taken weekly from the residue tank. Check samples have also been taken weekly at the deposition points to verify WAD 1000 online analyser results and the cyanide degradation profile. The environmental graphs for 2021, 2022 and 2023 were sighted and reviewed.

All exceedances were investigated, the file was sighted, and the relevant reports were reviewed. The Plant measures degradation between the residue sump WAD 1000 online sampler and the deposition points at the TSF. The degradation is used to calculate the expected WAD cyanide value between the weekly measurements at the deposition point, which is the deposition ICMI compliance point. The degradation varied between 30 and 50% and is detailed in each investigation report. The predicted values were below the deposition ICMI compliance value of 50 mg/l WAD cyanide.

The Plant reports that the WAD cyanide exceedances were mainly due to process challenges caused by plant stoppages, low-grade waste intake due to ore shortage, and erratic reef go-belt grades, which lead to spiking cyanide in the leaching process. Using the degradation process more optimally, and continuously monitoring the process dynamics, and controlling residual free cyanide between 40 - 70ppm has resulted in reduced exceedances.

The annual WAD cyanide graphs from the Plant WAD 1000 online analyser showed the following: -

**2021** - sighted exceedances and investigation reports:

- 21st, 22nd, 23rd, 24th and 25th of April 2021, WAD residual cyanide was 77.46ppm, 90.99ppm, 99.78ppm, 76.95ppm and 93.89ppm respectively
- 1st, 2nd and 18th of June 2021, WAD residual cyanide was 56.83ppm, 59.78ppm and 56.70ppm
- 12th May 2021, WAD residual cyanide was 83.69ppm
- 5th, 7th, 8th and 9th of October 2021, WAD residual cyanide was 50.92ppm, 59.98ppm, 55.63ppm and 55.60ppm



- 14th, 15th, 16th and 17th of September 2021, WAD residual cyanide was 78.95ppm, 72.45ppm, 69.60ppm and 53.31ppm

**2022** - sighted exceedances and investigation reports

- 12th, 13th, 15th, 17th, 18th and 25th of April 2022, WAD residual cyanide was 56.80ppm, 73.68ppm, 55.58ppm, 64.96ppm, 53.04ppm and 58.73ppm respectively.

- 12th and 13th of Aug 2022, WAD residual cyanide was 69.28ppm and 52.58ppm respectively.

- 1st, 2nd and the 3rd of February 2022, WAD residual cyanide was 98.95ppm, 99.95ppm and 69.65ppm.

- 5th, 6th, 7th, 22nd and 24th of January, 2022 WAD residual cyanide was 55.52ppm, 50.62ppm, 50.57ppm, 53.16ppm and 53.04ppm respectively.

- 15th July 2022, WAD residual cyanide was 62.05ppm.

- 21st, 22nd and the 23rd of June 2022, WAD residual cyanide was 55.51ppm, 69.01ppm and 69.04ppm, respectively.

**2023** - sighted Monthly results - no exceedances to the date of audit.

Monthly samples are taken from the return water dams by the Environmental Department and weekly by the Plant. Graphed results were reviewed, and no values exceeding 50 mg/l WAD cyanide were observed for the period since the previous audit. The Old Return Water Dam weekly analyses were all less than 0.25 mg/l WAD cyanide; therefore, the facility is not deemed a cyanide facility. The New Return Water Dam showed all samples less than 2.97 mg/l, except for a single outlier of 2.97 mg/l WAD cyanide. The plant's open waters are running at less than 50 mg/l WAD cyanide, and thus, no special measures are required to restrict access by wildlife and livestock.

Intasol (TSF contractor) daily reports include monitoring for wildlife mortalities. It was confirmed in the daily logbooks sampled that no bird or wildlife mortalities were recorded or reported since the previous audit. At the TSF Supervisor interview, it was reported that no cyanide-related bird mortalities have been reported since the previous recertification audit. Therefore, it can be concluded that current WAD cyanide management efforts effectively prevent significant wildlife mortalities. Leach solutions do not need to be managed as no heap leach operations are on the mine site.

*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:*

There are no discharges to surface water, and this was verified during the site inspection and document review. The TSF has a number of evaporation ponds which are kept empty and can contain and prevent any excess water or solutions from leaving the TSF footprint.

There are no indirect discharges to surface water. The nearest stream, Los Doring Spruit, is 3 km away, and no seepage could reach the stream, and this was verified during the site inspection. Borehole results do not indicate any cyanide groundwater pollution that could lead to indirect seepage to the Los Doring Spruit. As no indirect discharges have been identified, the operation is not engaged in any remedial activity to prevent further degradation or restore beneficial use.

**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*

The TSF is equipped with underdrains, paddocks and cut-off trenches, with seepage being pumped back to the TSF return water system for re-use in the process. Boreholes are sampled and monitored for cyanide. The old Return Water dam is clay-lined to prevent seepage, contains less than 0.5 ppm WAD cyanide, and therefore is not classified as a cyanide facility and excluded from the audit scope. The Lined Dam and the return water dam are plastic-lined to prevent seepage. This was verified during the site inspection.

The Bloemwater Water Company supplies the farms and livestock in the area with potable water by pipeline. No boreholes are used for watering, livestock use, irrigation, or drinking water. Boreholes are sampled and analysed for WAD cyanide. The Mine uses the national Department of Water Affairs and Sanitation standards for groundwater, which is 0.5 ppm free cyanide. Boreholes are sampled every 6 months. Borehole sampling results for relevant boreholes BH4 and BH5, BH3 and BH2 for the period 2021 to 2023 to date were sighted. All values were below 0.5 mg/l WAD cyanide except for one. Concerning the exception, a memo was sighted from Romeo Phaladi (Plant Metallurgist), date: 24 September 2021: Subject: BH4 High WAD cyanide investigation, which explained that the exceedance had been traced to a dead Meerkat (small mongoose found in Southern Africa) which had fallen in the borehole, causing false and misleading test results.

Due to low demand from the shaft, the backfill plant has not been in continuous operation since the last recertification in 2021. A Management of Change procedure will be done when recommissioning of the Backfill Plant is required.



The Backfill current standards limit the free cyanide in the final product sent underground to 20ppm free cyanide. Ferrous sulphate is added to the batch until the correct free cyanide level is achieved. Procedures in place include: “In the event of High WAD cyanide” - TGP67, “Backfill operation” - TGP70, and “Titrations: Cyanide and Lime” - TGP61.

The reporting system for backfill, including batch details, was sampled. A report dated 8/4/2022 was sighted, which included final free cyanide values. The batch from 1 Tank was delivered, and quality checks were satisfactory.

30% of the Plant tailings is pumped to the backfill plant where the slurry will be prepared and pumped to underground for backfilling purposes. However, Target backfill plant has been standing idle for over 3 years due to no backfill material being required by the shaft. Underground water pumped to the million-gallon dam is sampled, and the WAD cyanide is measured. Values are less than the 0.25mg/l WAD cyanide detection level from 2021 to 2023. One outlier was observed in 2021.

An Evaluation Report on the impact of backfill on worker health and beneficial uses of the underground water was available. A Risk Survey Backfill Bulkhead Report of 26 January 2010 showed that the maximum WAD cyanide from the bulkhead water is 1.46 ppm. HCN gas measurements indicated zero where people work, with one outlier of 1.3 ppm HCN gas. This is as per the initial certification audit.

At the time of the previous recertification audit, the Backfill Plant was only decommissioned a week before the audit, as there was no demand for backfill from the shaft. At the 2023 recertification audit, the situation remained unchanged. The backfill plant was put under care and maintenance and will be recommissioned when demand from underground is resurrected.

As seepage has not caused cyanide concentrations of groundwater to rise above levels protective of beneficial use, the results sighted did not indicate any contamination of underground water or the necessity for remediation.

***Standard of 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:***

Cyanide reagent strength storage tanks are placed on solid concrete plinths. This was confirmed in evidence from the Project Engineer at the time of construction of the Plant and included in previous certification audits.

All cyanide solution tanks (CIP (Carbon-In-Pulp) and Leach) are installed on ring beams and are placed inside concrete bund areas. The leach tanks are equipped with leak detection holes in the ring beam and inspected as per the RBI (Risk Based Inspection) Program. The CIP and Leach tanks are rubber-lined to reduce the risk of the tank base



plate leaking into the soil of the ring beam. They are inspected annually, as per the Risk Based Inspection (RBI) Program. An RBI procedure, "Risk Based Inspection (RBI) Program", was sighted and reviewed. The document includes Diagram Equipment/Component Risk Calculations in Detailed Analyses, Implementation:- Section 3.1 equipment type/list, Section 3.2 Risk Management with inspection activities covering inspections, leak detection checks, Thickness testing, Spark testing, Structural Safety Audit by a third-party qualified engineer and Section 3.3 Assessment and updating (Plan vs Actual).

All tanks are included in the DMS PMS system. All tanks are thickness tested. Thickness testing records are available for backfill tanks, all leach tanks 1-4, Adsorption tanks 1-8, Barren electrolyte tank, cyanide storage tanks 1 & 2, and the Residue Tank. Confirmed file and sampled.

RBI activities, as per procedure, were sampled and sighted. Work Order P064329, Leach tank no 5, Yearly inspection tank including inspections of rubber lining on the side wall and floor lining, as well as spark testing; two weekly Leak Detection inspection on tank 5 TP-1431-TNK-001 with no leaks detected; Thickness testing by Ultrasonic Services and Consultancy for tank 5, 6 and 7; and a spark test on No 5 leach on 4/5/2022. There is a program underway to replace the rubber on the leach tanks.

Bunds were surveyed previously to determine volumes. There have been no changes in capacities since the previous audit:

- Cyanide offloading and storage bund volume: 180 m<sup>3</sup>, largest tank 136.18 m<sup>3</sup>.
- Leach bund volume 1193.38 m<sup>3</sup>, largest tank 1213.9 m<sup>3</sup>. This bund is linked to the CIP Bund of 534.8 m<sup>3</sup>.
- CIP bund 534.81m<sup>3</sup>, largest tank 305.64m<sup>3</sup>.
- Residue bund 46.66m<sup>3</sup>, largest tank 17.6m<sup>3</sup> (leach, adsorption, residue and thickener bunds linked: the largest tank 1213.92m<sup>3</sup>, total linked volume 2892.22m<sup>3</sup>).
- Eluate bund 551.1m<sup>3</sup>, largest tank 339.02m<sup>3</sup>.
- Elution column bund 12.m<sup>3</sup>, elution column 7m<sup>3</sup>.
- ILR (InLine Leach Reactor) bund 13m<sup>3</sup>, largest tank 20.2m<sup>3</sup> (linked to electrowinning bund 21.07m<sup>3</sup>); and
- Electrowinning bund volume 21.07m<sup>3</sup>, largest tank 20.2m<sup>3</sup>.

The bund calculations were sighted, and the linked bund volumes are adequate to contain the biggest tank in each bund.

The Plant is designed with bunds and sump pumps, returning all spillage to the cyanide process tanks. There are no tanks installed on bare soil without secondary containment. This was verified during the site inspection. All sumps are equipped with level switches that automatically start the pumps, with the exception of the cyanide bund sump pump, which must be started manually. The procedure covering the manual operation of the cyanide bund sump pump is included in the procedure, Leaking Cyanide Storage Tank.

The reagent strength pipes are installed inside a "pipe-in-pipe", custom-designed system from the cyanide dosing pumps in the cyanide storage area to the leach and elution areas. Lower-strength process solution pipelines are mostly located above concrete to prevent infiltration to groundwater and are subject to periodic inspections. The DMS PMS system includes the TSF pipelines, and the TSF slurry pipeline is equipped with a spillage trench

to contain any leakage or spillage. This was verified during the site inspection. Daily Intasol pipeline inspections are conducted, and reporting is done by exception to the Plant control room, which then issues a job card or does an emergency shutdown to prevent leakage from spreading and manage the leakage. No plant or TSF pipelines cross streams or present a risk to surface water.

The cyanide tanks are constructed of steel, and there are double-walled HDPE (High Density Polyethylene) high-strength cyanide pipelines, and stainless-steel ball valves. Low-strength cyanide pipelines are made from mild steel.

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

in full compliance with

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

not in compliance with

*Basis for this Finding/Deficiencies Identified:*

No new Plant Cyanide Facility or TSF additions or extensions have been undertaken since the last recertification audit.

In the previous recertification audit, it was reported that, "... "no QA/QC documentation was available, as indicated in previous audit reports, and thus reliance is placed upon ongoing structural audits to ensure fit-for-purpose". This remains unchanged. A Structural Safety Audit of Target Plant, dated March 2022 and February 2021, signed by Jan Dijkman, Pr. Eng. was reviewed. The report included a visual inspection of the Plant with repair recommendations prioritised as emergency repair (Potential for serious damage, should be done within 12 months); maintenance (to be repaired to original condition before maintenance can commence, should be done within 24 - 36 months); and ongoing maintenance items (Preventative and corrective should be done on a continuous basis). One cyanide facility emergency repair for the structural steel at the adsorption section was identified in 2022 and repaired.

No other emergency repairs were identified, and the normal repairs and maintenance are planned for, with a follow-up inspection planned for 2023. The Structural Safety Audit items in the report are used to upload for capital structural rehabilitation funding. An example of the 2022 budget spreadsheet was sighted to illustrate this.

No emergency repair items that would impact on the ability of the facility to continue to operate within established parameters consistent with the Code's Principles and Standards of Practice were identified.

**The annual TSF report 2022 and the third Quarter TSF report 2023 raised concerns on both Target TSF 1 and 2, and recommended that "Target TSF is in a poor state with numerous stability concerns and deposition should be stopped." The Engineer of Record is not prepared to issue "fit-for-purpose" confirmation for TSF 1 until the completion of the mitigating recommendations, including additional reinforcing rock buttressing work.**



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

*Basis for this Finding/Deficiencies Identified:*

Target Gold Plant has a Target Plant Cyanide Decommissioning Plan, Plan for Cyanide Facilities, rev 8, dated August 2023. The Plan includes Section 8, Duration of Decommissioning. Section 3 of the Plan requires review every two years.

The Plan includes all the requirements of the Code, and the section headings are: -

1. Introduction
2. Cyanide Usage and Distribution
3. Plan Review/Update
4. Definition: Decommissioning
5. Objective
6. Specific Requirements
7. Sequence of Decommissioning Activities
8. Duration of Decommissioning
9. Cost estimation for the decommissioning process

A Table at the end of the document lists specific detailed cyanide decommissioning tasks. The document meets the requirements of the Cyanide Code.

**Standard of Practice 5.2:** *Establish a financial 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 Report, Target, June 2022, prepared for Harmony Gold Mining Company Limited, was sighted,

The Report includes, under section 12, a cyanide decontamination reference to "...requirement for funds set aside for cyanide decontamination South African Rands 385,200 has been included for the cleaning and removal of sodium cyanide systems..."

The Closure Cost Assessment Report, Target, June 2023, prepared for Harmony Gold Mining Company Limited, was sighted.

The Report includes under section 12, cyanide decontamination reference to "...requirement for funds set aside for cyanide decontamination South African Rands 412,549.00 has been included for the cleaning and removal of sodium cyanide systems..." Costing is based on third-party implementation.



The closure cost estimates are updated on an annual basis as per the Minerals and Petroleum Resources Development Act, no 28 of 2002 requirements. 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. These Fund provisions fully include the required cyanide-related decommissioning costs for third party implementation. The Target Mine Trust Fund financial statements for the year ending 2021, included in the Avgold Nature Conservation Trust document, prepared by Price Waterhouse Coopers and signed on 16 May 2022 by Herman Perry, were sighted. Also sighted were the Target Mine Trust Fund financial statements for the year ending 30 June 2022 (latest available), 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, on 31 May 2023.

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

***Standard of Practice 6.1: Identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce 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 should be conducted to minimise worker exposure. (See also Standard of Practice 4.1 above.) The SLAM (Stop, Look, Assess and Manage) system is also used before any task is conducted as part of pre-work inspections. The procedure index was reviewed, and 8 procedures were sampled: -

- *Cyanide Decontamination – TGP12*  
This procedure describes decontamination prior to maintenance and disposal of redundant equipment.
- *Change pipes in cyanide area - TGP6*  
This procedure includes preparations and protection undertaken prior to the change of pipes.
- *Liquid Cyanide Offloading - TGP38*  
This major procedure describes in detail the liquid cyanide offloading process, step by step, and the precautions and protection that need to be undertaken.
- *Clearance certificate for Vessel Entry - TGP9*



This procedure describes the precautions, checks and approvals required before vessel entry.

- *Clearance Certificate – Hot Work – TGP8*  
This procedure describes the precautions, checks and approvals required before hot work is carried out.
- *Engineer’s permission for maintenance: TGP23*  
Includes the Engineer’s review of risk assessment for a task before permission is granted.
- *Working in Confined Space and Cyanide Storage Vessel - TGP66*  
Includes pre-inspections of SCBA (Self-Contained Breathing Apparatus) sets, airline masks, safety lines, and gas testing.
- *Removal of redundant cyanide equipment - TGP53*  
Includes the checks and tests necessary to ensure redundant cyanide equipment is safe.

All procedures include the necessary PPE (Personal Protective Equipment) required for the task to be undertaken, and the pre-work inspections that need to be carried out.

The Intasol Tailings Operational Manual, Harmony Target Plant, includes the thirteen Standard Work Procedures (SWPs) used on the TSF. These are supported by 19 Issue-Based Risk Assessments (IBRA) in place. Procedures include required PPE (Personal Protective Equipment) and pre-work inspections requiring the SLAM system (Stop, Look, Assess and Manage) to be carried out before all tasks.

The operation solicits and actively considers worker input in developing and evaluating health and safety procedures and practices. Daily Green Area Meetings and Toolbox meetings involve all workers, and these are where production, safety, and health issues are discussed. Weekly Health and Safety meetings and monthly Safety Representatives’ meetings are also opportunities for workers and workers representatives to raise issues relating to health and safety procedures and practices. Workers are also involved in risk assessments. All workers are involved with the SLAM system, and any broader issues raised during the SLAM can be raised with supervisors.

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

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

The Plant is run at a pH of 10.5 on thickener, and the leach pH is run at pH 10.5 to 11. An interlock is in place on the thickener, tripping out the cyanide dosing pumps at a pH of less than 9. Witwatersrand ores are typically leached at a pH above 10.5 to minimise



HCN gas formation. A procedure, In the event of low pH, is in place to manage low pH episodes.

Fixed HCN (Hydrogen cyanide) gas monitors were placed where the risk of HCN gas generation exists during abnormal conditions. The fixed HCN gas monitors are installed on top of a cyanide storage tank, and one in each of: - the cyanide bund, near the residue tank, in the smelt house, and at the top of the leach (five in total). Six portable PAC 8000 HCN gas monitors are used in the Plant. The PAC8000 personal HCN gas monitors alarm at 4.7 and 10 ppm HCN gas levels. At an alarm of 4.7 ppm, workers must use PPE and notify their supervisor, and at 10 ppm, they must evacuate immediately. Polytron fixed monitors alarm at 10 ppm HCN gas levels requiring evacuation. A notice at the cyanide leach stating what to do at alarm 4.7 ppm and 10 ppm HCN gas was observed. During the site inspection, it was confirmed that the installation of cyanide hot spot signage at potential HCN gas risk areas on the Plant had been completed.

The fixed Polytrons and portable PAC 8000 units are calibrated and maintained by manufacturers, Dräger, as per their recommendations at 6 monthly. The calibration certificates file was sighted, including calibration and maintenance on a 6 monthly basis.

Fixed Polytron and personal PAC8000 Gas monitors' calibration and maintenance sampled: -

- 28/6/23 (5 PAC 8000 and 2 fixed Polytrons)
- 9/3/02023 (6 PAC 8000 and 4 fixed Polytrons)
- 24/11/2022 (7 PAC 8000 and 6 fixed Polytrons)
- 20/6/2022 (5 PAC 8000 and 6 fixed Polytrons)
- 2/3/2022 (5 PAC 8000 and 6 fixed Polytrons)
- 25-05-2021 (5 fixed Polytrons)
- 14/2/2021 (1 fixed Polytron)
- 24/8/2020 (5 PAC 8000 and 6 fixed Polytrons).

The placement of appropriate warning signs advising workers that cyanide is present, necessary personal protective equipment that must be worn, and that smoking, open flames and eating and drinking are not allowed, was observed during the Plant site inspection. It was confirmed that warning signs were erected at TSF access points. The 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. Major signs are also erected at the entrance of the TSF, highlighting potential assembly and access points for ambulances.

Red dye is added by Sasol, the cyanide producer, at the production facilities, before delivery to the Target Gold Plant. The Sasol Safety Data Sheet was reviewed and included that the cyanide's colour is light to dark red.

During the site inspection, it was confirmed that dry powder fire extinguishers and safety showers are installed at strategic points where cyanide is used. Fire extinguishers are inspected by monthly contractors (FireQuip). Up-to-date inspection tags were sampled and checked on the fire extinguishers during the site inspection. Safety showers are included in the DMS PMS (confirmed during the DMS electronic review). Safety showers are inspected by a fitter monthly. The procedure, Testing Safety Showers and Eyewashes for Operation, is the guide for testing showers and eye washes. The procedure, Cyanide Facility Inspections, requires that cyanide facilities must be inspected





PPE inventory, and fire extinguishers' presence and suitability. Completed checklists for the cyanide trailer and cyanide first aid boxes 1, 2 and 3 on 25th March 2021, 14th February 2022, 8th September 2023, and 13th February 2024 were sampled. All Tri-Pac cyanide antidotes are stored in fridges, as per the manufacturer's recommendations. Procurement of fresh antidotes is handled centrally by Harmony Gold Mining Company. The emergency team from the Plant will respond to TSF emergencies with the necessary cyanide response equipment. All employees and fixed-term contractors have been trained in cyanide first aid. Fresh water is available for the TSF employees. No cyanide antidote is kept at the TSF.

There is a Target Metallurgical Plant: Cyanide Emergency Preparedness Procedure for response to cyanide exposures. Under "Cyanide Poisoning", on page 15, responses to inhalation, swallowing, skin contact, and eye contact are detailed. The COP 2 Mandatory Code of Practice for Mine Residue Deposits includes specific emergency response plans for the TSF.

All shifts on the Plant are trained as emergency responders, with additional people available on dayshift using the first, second, third and fourth responder system described in detail in the procedure, Conducting Cyanide Drills. First Responders will administer oxygen, and when paramedics and doctors or nurses arrive, they will administer cyanide antidotes as required. A Cyanide emergency room and cyanide emergency trailer are available at the Plant. This was confirmed during the site inspection.

Agreements were in place with St Helena Hospital and Netcare 911 for the transport and treatment of cyanide patients (The Netcare 911 contract continues.). St Helena Hospital was used from 2015 to 2023. A full project plan, including an MOC exercise, was used to communicate the cyanide emergency responses to St Helena Hospital. The Hospital was also included in full cycle drills from the other Harmony Free State Gold Plants. There is now a contract in place with RH Matjhabeng Private Hospital: Agreement between Harmony Gold Mine and RH Matjhabeng Private Hospital Pty Ltd signed by the Hospital Manager, dated 13 November 2023 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 (referring to the Cyanide Code).

Harmony arranges a maximum of two cyanide drills per year, and Harmony will inform the Hospital Manager of the drills. Cyanide Training of the Medical Staff will be facilitated by Harmony and is scheduled annually. The procedure, Ambulance Entry in the Event of an Emergency, covers the expedited entry and exit of ambulances for emergency evacuations (including cyanide patients). A full cycle drill from the Plant to Matjhabeng Private Hospital was undertaken on 23 November 2023:

The scenario of the drill was a cyanide splashing at the cyanide offloading area. The deficiencies identified were: no proper head count, and senior personnel not taking responsibility for their subordinates; and no effective communication between Netcare 911 and the medical staff at the Hospital. Good practices included all personnel responding to the alarm and going to the respective assembly points. The action plan will be implemented using mini drills in the short term and tested during a full cycle drill scheduled for March 2024.



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

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

**X in full compliance with**

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

***Basis for this Finding/Deficiencies Identified:***

There is a Target Metallurgical Plant: Cyanide Emergency Preparedness Procedure, TGP 69, for response to cyanide exposures. The COP 2 Mandatory Code of Practice for Mine Residue Deposits includes specific emergency response plans for the TSF.

The Emergency procedures, TGP69, include the following scenarios and procedural responses: -

- *Catastrophic HCN gas release*, including trigger points and cross-referencing Target Plant procedures: - TGP2, TGP15, TGP19, TGP32, TGP44, TGP56 and TGP63.
- *Cyanide tanker incident/accident*, including cyanide incidents during offloading and cross-referencing Target Plant procedures: - TGP15, TGP19, TGP21, TGP39, TGP40, and TGP62.
- *Cyanide structural fires and explosions, and cyanide storage tanks, pipelines, pumps, elution oil heaters, cyanide storage tank heaters, and Explosions*, cross-referencing Target Plant procedures: - TGP43, TGP56, and the Mine ERP procedure S.P. G1.08 on fire extinguishing.
- *Cyanide Solution and Slime Spills*, cross-referencing Target Plant procedures: - TGP12, TGP21, TGP29, and TGP41.
- *Multiple Cyanide Accidents/Incidents*, cross-referencing Target Plant procedures: - TGP12, TGP15, TGP19. TGP31 and TGP32.
- *Tailings dams' incidents/accidents, failures*, cross-referencing Target Plant procedures: - TGP12, TGP15, TGP19, and TGP21 and COP 2 Mandatory Code of Practice for Mine Residue Deposits, Target Plant, section 8.7.10.1. Emergency Preparedness and Recovery Plan. Any seepage from the TSF is collected in the surrounding paddocks and returned to the TSF. Uncontrolled seepage from the TSF would be dealt with by the TSF management in consultation with the Engineers of Record.
- *Total power failure* is covered on page 18.
- *Cyanide incidents on Transportation Routes*, Tanker Services provides all cyanide deliveries and is fully responsible for transport-related cyanide incidents as per the Sasol contract and Tanker Services transport agreement (See Principle 1 above.). Tanker Services is a fully certified ICMI transporter.

- *Site Evacuation* is addressed in Section 6, Evacuation during any emergency, and cross-references to procedure TGP15. From a community perspective, only Farmers need to be evacuated (Tailings dams' incidents and accidents).
- *First aid treatment procedures* are included in Appendix A - cyanide first aid treatment procedure and cyanide poisoning.
- *Environmental Monitoring of Surface Water* is covered in environmental procedure EPR 25b (25a)
- *Cyanide solution and slimes spills* are covered in cross-references to procedures TGP 12 and TGP15.

*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:*

Use is made of Toolbox talks, weekly safety meetings and induction to cover cyanide emergency procedures and topics for the workforce and visitors. Emergency Response Procedures are signed off by the plant workforce representatives. Details on community involvement in emergency response is included in Standards of Practice 9.1 and 9.2 below.

*Harmony No 1 Plant and Target Plant*

A Meeting to discuss the management of cyanide emergencies in the Matjhabeng municipality area was held on 13 and 14 September 2022 (chaired by Katlego Moalusi and Rendani Mikosi) and on 8 and 9 December 2021 (chaired by Cyril Radebe, Masala Tshamamo Environmental Manager), and on 17 and 18 November 2020 (chaired by Johnny Botha, Cyril Radebe, Teboho Tlhobo, Irene Nadunga - Environmental Manager). Present from the Emergency Services included representatives from the SAPS (South African Police Service) flying squad, Matjhabeng Fire and Rescue, Paramedics, One Life 911, ER24 (private ambulance service), Netcare 911 (private ambulance service), St Helena Hospital, EMS (State ambulance Emergency Medical Services), RH Matjhabeng Private Hospital (Previously Ernst Oppenheimer Hospital), and Environmental Health Practitioners. Management and specialist Representatives from Harmony 1 Plant and Target Plant facilitated and chaired the meetings. The presentation: Harmony Gold Mine Cyanide Awareness Presentation, used for communication to the stakeholders, was sighted. The presentation includes: - Production, Transportation, Training, Dialogue, Operations, and Emergency Response.

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



**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

The Emergency procedures, TGP69, designate emergency response coordinators and their roles and responsibilities. Emergency response teams are listed by name, their roles and responsibilities are included, and their training is designated in the training matrix. The Emergency Contact flow chart indicates the call-out process and is read in conjunction with the Emergency Contact procedure. Standby personnel will be contacted as per the duty roster. Emergency phone numbers are included and are displayed in the control room and the emergency first aid room. A cyanide first aid equipment inventory appears in Appendix B of TGP69, and also refers to procedures TGP14 and TGP16. Emergency response equipment is inspected as per the cyanide facility inspection procedure.

St Helena Hospital was used from 2015 to 2023. A full project plan, including an MOC exercise, was used to communicate the cyanide emergency responses to St Helena Hospital. The Hospital was also included in full cycle drills from the Harmony Free State Plants. The Hospital staff were given cyanide awareness training annually. A sample of an attendance register of cyanide awareness training on 1 September 2020 was sighted.

There was a contract in place with St Helena Hospital stipulating that St Helena would accept serious cyanide patients and the management thereof in accordance with the cyanide protocol (meaning the Cyanide Code), which was signed on 18 December 2014.

An Amendment to the main agreement for the emergency rescue and support services for Harmony Group entered between Harmony Gold Mining Company Limited and Netcare Hospitals Propriety Limited, trading as Netcare 911 (Ambulance services), was signed at Welkom on 28 February 2019. This service continued when the hospitals were changed from St Helena Hospital to Matjhabeng Private Hospital.

There is a contract in place with RH Matjhabeng Private Hospital: Agreement between Harmony Gold Mine and RH Matjhabeng Private Hospital Pty Ltd, signed by the Hospital Manager, dated 13 November 2023 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 (meaning the Cyanide Code). Harmony will 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.

A report on a full cycle drill from the Plant to Matjhabeng Private Hospital on 23 November 2023 was sighted: -

- The scenario was a cyanide splashing at the cyanide offloading area. The deficiencies identified:

- no proper head count, and senior personnel not taking responsibility for their subordinates.



- No effective communication between Netcare 911 and the medical staff at the Hospital. Good practices included that all personnel responded to the alarm and went to the respective assembly points. The corrective action plan will be implemented using mini drills in the short term and tested during a full cycle drill scheduled for March 2024.

**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 emergency Procedures, TGP 69, include details and contact information for notifying management, regulatory agencies, external response providers and medical facilities of the cyanide emergency. Section 5, describes procedures for communication with the public and the media, contact information is contained in Target Metallurgical Plant: Cyanide Emergency Preparedness Procedure.

A Procedure No TGP91 entitled, "Procedure to Notify ICMI of Any Significant Cyanide Incident" is in place. It includes the ICMI definition of a Significant Cyanide Incident being cyanide incidents that include any of the following confirmed events:

- a) Human exposure that requires an action by an emergency response team, such as decontamination or treatment;
- b) An unpermitted release which enters natural surface waters, on or off-site;
- c) An unpermitted release that occurs off-site or migrates off-site;
- d) An onsite release requiring action by an emergency response team;
- e) A transport incident requiring emergency response for cyanide release;
- f) An event of multiple wildlife fatalities where cyanide is known or credibly believed to be the cause of death; and
- g) Theft of cyanide.

The procedure includes reporting significant incidents within 24 hours of the occurrence and following up with a fuller investigation report within 7 days. There have been no significant cyanide incidents that have needed to be reported to ICMI 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 Procedure, Cyanide Emergency Preparedness Procedure (CEPP), TGP69, Section 7, decontamination and rehabilitation, indicates that contaminated soil will be returned to the plant for disposal. The Harmony Environmental Department will take charge of monitoring of the spill clean-up and decide when the clean-up has been successfully completed. Procedure TGP12 (Cyanide Decontamination), and TGP41 (Liquid cyanide spillage) describe recovery and neutralisation of cyanide solutions and solids, and management and disposal of spill cleanup debris.

The provision of an alternate drinking water supply is not an issue as potable water is supplied by pipeline by the Bloemwater Water Company, and no boreholes are used.

The Procedure, Use of Ferrous Sulphate, TGP 62, details usage specifications including quantities for mixing. Ferrous sulphate is stored in the chemicals store in the Plant. Soil is declared decontaminated when the cyanide levels are below 0.5 ppm WAD cyanide.

In the Environmental procedure, Environmental Monitoring of Surface Water, it states, "...chlorine/chloride or hypochlorite, ferrous sulphate and hydrogen peroxide reagents are prohibited for direct treatment of cyanide spills in flowing surface water, since these compounds are toxic..." This message is repeated in CEPP TGP69, Section 7, decontamination and rehabilitation.

The Environmental procedure, Environmental Monitoring of Surface Water, Section 11, states, "... 11.2 Action at the spillage site includes spillage containment and barricading. The details regarding the sampling sites, the frequency and the length of sampling will be managed by the Environmental Manager according to the site circumstances..." Sampling and Monitoring are also addressed in CEPP, TGP69, Section 7 decontamination and rehabilitation, appendix C, and procedures TGP 12 and TGP 41.

***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:*

Procedure TGP 69, Section 3.7 Review, requires review as follows: -

" ...3.7 UPDATE AND REVIEW OF EMERGENCY PROCEDURE

This procedure will be reviewed as follows:

- \* Cyanide incident or accident has occurred
- \* Following a cyanide drill
- \* Biennial (every two years)
- \* Process modification which may affect the use of cyanide
- \* Modification to the safety equipment, e.g. safety shower, safety alarms, etc...."

The COVID-19 pandemic restricted contact and affected cyanide drills during 2020 and 2021. Drill schedules were sighted and sampled. The 2020 schedule, including mandown and spill scenario drills, was sighted.

There was a full cycle mandown drill on 22 September 2022. The scenario was a mandown drill at the cyanide offloading area. A memo to the Plant Manager was sighted with findings and action. Included was: -

- a template including route register, substandard conditions, practice hazard items, and checks, actions, completion date, and responsible persons.
- the attendance register,
- the Control room report, and
- the Cyanide emergency drill retraining and follow-up.

A cyanide Spill drill was held on 28 February 2022. A memo to the Plant Manager was sighted with findings and actions. Included were attendance registers, and the environmental spill checklist, which was deemed more applicable to spills.

Mini training drills (i.e. not full drills to the Hospital) are conducted on an ad hoc basis.

As a part of the orientation of the new Hospital, a full cycle drill from the Plant to Matjhabeng Private Hospital was held on 23 November 2023. The scenario was a cyanide splashing at the cyanide offloading area. The deficiencies identified were:

- No proper head count, and senior personnel not taking responsibility for their subordinates.
- No effective communication between Netcare 911 and the medical staff at the Hospital.

Good practices included all personnel responding to the alarm and going to the respective assembly points. The action plan will be implemented using mini drills in the short term and tested during a full cycle drill scheduled for March 2024.

At the TSF, an emergency drill report for Cyanide Mandown on 1 March 2022, including the drill procedure, emergency scenario mark sheet and feedback, and attendance register with remarks. The drill was site-based, not to the Hospital. A mandown drill was held on 10 March 2021 from the TSF to the St Helena Hospital. The ambulance drove to the bench on the TSF.

A Cyanide Mandown drill was held on 24 August 2023 at 09:30. The drill reflected how the TSF staff should respond in a real-life scenario. The Slime Dam Supervisor, together with Team members, conducted the drill. The Plant Emergency Response Team responded to the emergency call. The attendance register was included in the report. Also included in the report was the emergency scenario mark sheet and feedback, with good remarks. Feedback indicated that the First Aid responder arrived, and the ambulance took the wrong road. It is planned to conduct a drill again to confirm corrective action was implemented.

Review of Emergency Response procedures will be carried out according to Section 3-7, " ...3.7 UPDATE AND REVIEW OF EMERGENCY PROCEDURE

This procedure will be reviewed as follows:

- \* Cyanide incident or accident has occurred
- \* Following a cyanide drill
- \* Biennial (every two years)
- \* Process modification which may affect the use of cyanide



\* Modification to the safety equipment, e.g. safety shower, safety alarms, etc.....”

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

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

**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, contractors and Intasol TSF Operators) are trained in basic cyanide hazard awareness. Modules include cyanide basic training, cyanide materials present at the operation, the health effects of cyanide, and the symptoms of cyanide exposure, using a video. (The program material was viewed.) The video includes a section on cyanide emergency response, from the identification of the incident to the dispatch of the patient to the Hospital by ambulance. The video further includes a section on the offloading of cyanide. The training department has implemented new cyanide training material, which will improve the cyanide training of plant personnel. Basic cyanide awareness training is being done using e-learning and includes cyanide hazard recognition. The cyanide awareness module forms part of the e-learning system. The cyanide awareness training records are contained in the e-learning system.

The access card system blocks staff who have not undertaken the induction program or refresher, including cyanide hazard awareness. All Heads of Departments (HODs) receive training planning notifications every Friday.

The training matrix (including Target employees and all contractors) for induction and cyanide training has a cell indicator: Red = expired, straw colour = 1 month before expiry, and green = outstanding. It was confirmed that the matrix data is up to date.

The TSF receives training from the Plant and carries out its own training. Training conducted by the Plant includes: -

- The Buddy system,
- Conducting cyanide drills,
- Cyanide first aid treatment,
- Cyanide PPE control, care and examination,
- High cyanide levels in residue slime,
- General lock-out procedure,
- Keeping the mortality register, and
- Operating PAC 8000 personal gas monitor.

The Intasol training matrix for 2023 was reviewed and included the date and expiry date and all attendees’ names. Refresher training is done annually for staff after returning from



leave, which was confirmed in the training matrix. Records are retained for 40 years on the Plant, after which the records are sent to the central archive. The training records of the interviewees were sampled and found to be up-to-date and complete.

*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:*

Plant training matrices include STPs (Standard Task Procedures) required per staff member's name, and as required by the staff member's job. In addition, The Mine Qualifications Authority (MQA) unit standard structures are also used for job training. All cyanide-related STPs are trained appropriately. The cyanide STP matrix 2023 to date was sighted and confirmed to be fully up to date. The majority of training is undertaken using the e-learning system. A document breaking down all STPs and categories of jobs required to be trained into categories of Management, Security, Process, Maintenance, Emergency Personnel and TSF was sighted.

On the TSF, the Safe Work Procedures (SWPs) for each set of tasks are used as the base training material. The Intasol Training Matrix for 2023, including all Safe Work Procedures and indicating the expiry dates and date of PTOs (Planned Task Observations), was sighted. The system is based on a rolling carryover system.

Israel Khuduga is the Plant Training Officer. He is trained as a Facilitator, Assessor, and Moderator and has completed a train-the-trainer course. Certificates were sighted, including a Moderator certificate of competence from Maccauvlei Learning Academy, issued on 5 September 2017, an Assessor certificate issued by Colleen Osorio Skills Development Consultancy (Reg no ETDP 9980) on 18 April 2012, and a MQA Assessor Registration dated 12 July 2012. Also sighted was his National Diploma in Occupationally Directed Education, Training and Development Practices dated 29/09/2020.

All employees and contractors are trained before being allowed to work on a cyanide section (controlled by the access card system and Human Resources Department). Assessments are used to test knowledge, and the competency pass mark is 100%. E-learning uses multiple-choice assessments and repeat assessments if learners do not score 100%. For the TSF, all new employees are given a site-specific cyanide awareness induction by Harmony. Intasol training is based on "on-the-job" task training, using Safe Work Procedures and PTOs. Competency testing is based on conducting Planned Task Observations (PTOs) by the Supervisor or the Site Manager. PTOs are done on all SWPs required for the job.



On the Plant, a PTO system is in place, and all supervisors are required to do PTOs on their staff. Pre-work assessments are conducted, which could lead to additional refresher training if the pre-work assessments are inadequate. A yearly workbook is completed, containing all procedures signed off by the supervisor and by the operator. On the TSF, Refresher training is done annually. Annual refresher training on operational tasks, using the SWPs, is conducted on return from leave. PTO schedules are used for planning the PTOs. The PTO calendar from September 2022 to Nov 2023 was sighted. The Intasol Planned Task Observation Procedure, including the training attendance record, was sighted.

The Plant PTO folder was reviewed, and PTOs were sampled: -

**2023:**

- Sampled Operating PAC 7000 on 23/3/23 on RV Greeff by R Schultz - no deviations noted.
- Sampled Clearing a choked cyanide spigot on 22/7/23 on P Lebakeng by R Schultz - no deviations noted.
- Sampled Offloading Cyanide on 26/6/23 on Johannes Sithole by KM Leshoro - no deviations noted.

**2021:**

- Sampled In the event of high HCN gas at Residue and Leach on 14/11/2021 on RV Greeff by R Schultz - no deviations noted.
- Sampled Offloading Cyanide on 6/2/21 on D Olivier by S D Fourie - no deviations noted.
- Sampled Cleaning of Electrowinning cells on 10/2/2021 on Ivan Cox by Siebert Venter - no deviations noted.

Assessments are done for on-the-job competency for a section by the Training Officer. Tests are done as per the Mining Qualification Authority (MQA) in the e-learning system.

On the TSF, Intersol uses PTOs and, additionally, uses informal, safe behaviour observation methods. Targets are set by Management periodically. PTOs are done on all SWPs required for the TSF jobs and are signed by the observer and person observed.

**Sampled PTOs in 2021**

- Valve Operating on Ramotselesi (General Worker) on 6 January 2021 by Yorepua George, found competent.
- Valve Operating on Maxwell Team leader on 6 January 2021 by Yorepua George, found competent.

**Sampled PTOs for 2023**

- Depositing slurry on the TSF on Maxwell Team leader on 14 August 2023 by SA Mofekeng, found competent.
- Manual Wall building on L Maxwell Team leader on 15/11/2023 by Ramotselesi, found competent.
- SWP Cyanide on Ramotselesi dated 2/10/2023 by SA Mofekeng, found competent.
- SWP Cyanide on N Dini dated 2/10/2023 by Ramotselesi, found competent.
- SWP Cyanide on T Manuka general worker, on 2/10/2023 by Ramotselesi including comment evacuating in time, found competent.



Plant training records are retained for 40 years on the Plant, after which the records are sent to the central archive. The records include the names of the employees, the dates of training, and the topics covered. As this is e-learning, there is no physical trainer and the employees are tested electronically. If they achieve less than 100%, they repeat the training until they score 100%. The training records of the interviewees were sampled and found to be up-to-date and complete. On the TSF, training records are kept at the Site in hard copy format for at least 5 years. The training record of the interviewee was sampled and found to be up-to-date and complete.

***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 plant employees receive induction, including cyanide emergency response and first aid knowledge. Training matrix TGP18 specifies required training for emergency response teams. Every shift is trained in Emergency Response. The first, second, third, and fourth responder system is included in procedure TGP11, Conducting cyanide drills, rev 3. There are 5 additionally trained Emergency Responders on each shift. These are the employees that will handle cyanide decontamination and cyanide exposure incidents although all employees receive the necessary training. First to Fourth Responder duties are also included in the Target Metallurgical Plant: Cyanide emergency preparedness procedure TGP69. Refresher training is given annually.

A Meeting to discuss the management of cyanide emergencies in the Matjhabeng municipality area was held on 13 and 14 September 2022 (chaired by Katlego Moalusi and Rendani Mikosi) and on 8 and 9 December 2021 (chaired by Cyril Radebe, Masala Tshamamo Environmental Manager), and on 17 and 18 November 2020 (chaired by Johnny Botha, Cyril Radebe, Teboho Tlhobo, Irene Nadunga - Environmental Manager). Present from the Emergency Services included representatives from the SAPS (South African Police Service) flying squad, Matjhabeng Fire and Rescue, Paramedics, One Life 911, ER24 (private ambulance service), Netcare 911 (private ambulance service), St Helena Hospital, EMS (State ambulance Emergency Medical Services), RH Matjhabeng Private Hospital (Previously Ernst Oppenheimer Hospital), and Environmental Health Practitioners. Management and specialist Representatives from Harmony 1 Plant and Target Plant facilitated and chaired the meetings.

Plant training records are retained for 40 years on the Plant, after which the records are sent to the central archive. The training records of the interviewees were sampled and found to be up-to-date and complete. The cyanide emergency response training records include the names of the employee and the trainer, the date of training, and the topics



covered. As the training is often field practice, there are not always documented assessments of the training.

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

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

**X in full compliance with**

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

***Basis for this Finding/Deficiencies Identified:***

The following stakeholders were identified: All emergency departments, communities around the mining areas, farmers around the mining areas, livestock owners and cattle herders, Boiketlong village, and Brand 5 hostel. Public flyers were posted to all stakeholders: Cyanide Management at Harmony Target Plant.

A Meeting to discuss the management of cyanide emergencies in the Matjhabeng municipality area was held on 13 and 14 September 2022 (chaired by Katlego Moalusi and Rendani Mikosi) and on 8 and 9 December 2021 (chaired by Cyril Radebe (Target Process Plant Manager), Masala Tshamamo Environmental Manager), and on 17 and 18 November 2020 (chaired by Johnny Botha (No 1 Process Plant Manager), Cyril Radebe, Teboho Tlhobo, Irene Nadunga - Environmental Manager). Present from the Emergency Services included representatives from the SAPS (South African Police Service) flying squad, Matjhabeng Fire and Rescue, Paramedics, One Life 911, ER24 (private ambulance service), Netcare 911 (private ambulance service), St Helena Hospital, EMS (State ambulance Emergency Medical Services), RH Matjhabeng Private Hospital (Previously Ernst Oppenheimer Hospital), and Environmental Health Practitioners. Management and specialist Representatives from Harmony 1 Plant and Target Plant facilitated and chaired the meetings.

Public communication flyers were posted to the stakeholders, and copies of flyers dated 30 August 2022 were sighted. The presentation: Harmony Gold Mine Cyanide Awareness Presentation, used for communication to the communities, was viewed. The presentation includes: Production, Transportation. Training, Dialogue Operations, and Emergency Response. Cyanide community awareness visit notes were sighted for: -  
- 4 November 2021 - Cyanide community awareness interaction at the Allanridge Loraine fuel station. Members were made aware of possible life-threatening injuries when using Mine return water dams for their commercial purposes.  
- 14 December 2022 - Schools Awareness at Tshireletso and Dihwai Primary Schools. Training learners that swimming in the return water dams of active slimes dams is dangerous and prohibited.



- 17 November 2023 - Cyanide awareness school visit at Allanridge Primary School, training learners that swimming in the return water dams of active slimes dams is dangerous and prohibited.

*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 communication (including information on cyanide) flyers were posted to the stakeholders. Copies of flyers dated 30 August 2022 were sighted. The Public flyers in English and Sesotho were posted to all stakeholders: Cyanide Management at Harmony Target Plant. The presentations are in English, and the material is verbally presented in the local languages of Sotho and Zulu. The local population is primarily literate. Percentages for the illiterate portion of the local population are not available.

No cyanide accidents or incidents have occurred since recertification. It is reported that any cyanide incidents or accidents would be reported, after investigation, in the subsequent ESG (Environmental, Social, Governance) Report. The Harmony ESG Report for 2021 contains a section on the Cyanide Code under, Tailings and Waste Management, on page 41. The Harmony ESG Report 2022, dated 30 June 2022, includes multiple references to the Cyanide Code in text and tables. The website reference is: - <https://www.har.co.za/22/download/HAR-ESG22.pdf>.

Fatal or mass incidents 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 or critical incidents.

Mine releases are reported to the Department of Water and Sanitation (DWS) and the Department of Environmental Forestry and Fisheries (DEFF), and the National Nuclear Regulator (NNR), following an investigation by the Mine Environmental and Occupational Hygienist Departments. The DWS, DEFF and the NNR 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. The Harmony Group Communication Policy is followed.

