INTERNATIONAL CYANIDE MANAGEMENT INSTITUTE

Cyanide Code Certification Audit Mining Operations

Summary Audit Report

Harmony Gold Mining Company Savuka Gold Plant South Africa

20th – 24th February 2023

For the International Cyanide Management Code

Name of Operation:	Harmony Gold Mining, Savuka Gold Plant
Name of Operation Owner:	Harmony Gold Mining
Name of Operation Operator:	Harmony Gold Mining
Name of Responsible Manager:	Mr Stanley Selamolela
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Location detail and description of operation:
Harmony Gold Mining's Savuka Gold Plant is located in the Carletonville area, approximately 90 km Southwest of Johannesburg in the Gauteng Province, South Africa. Savuka Gold Plant was commissioned in 1961 with a rated capacity of 300,000 tons of ore per month and feed sources from Savuka and Tautona Mines.

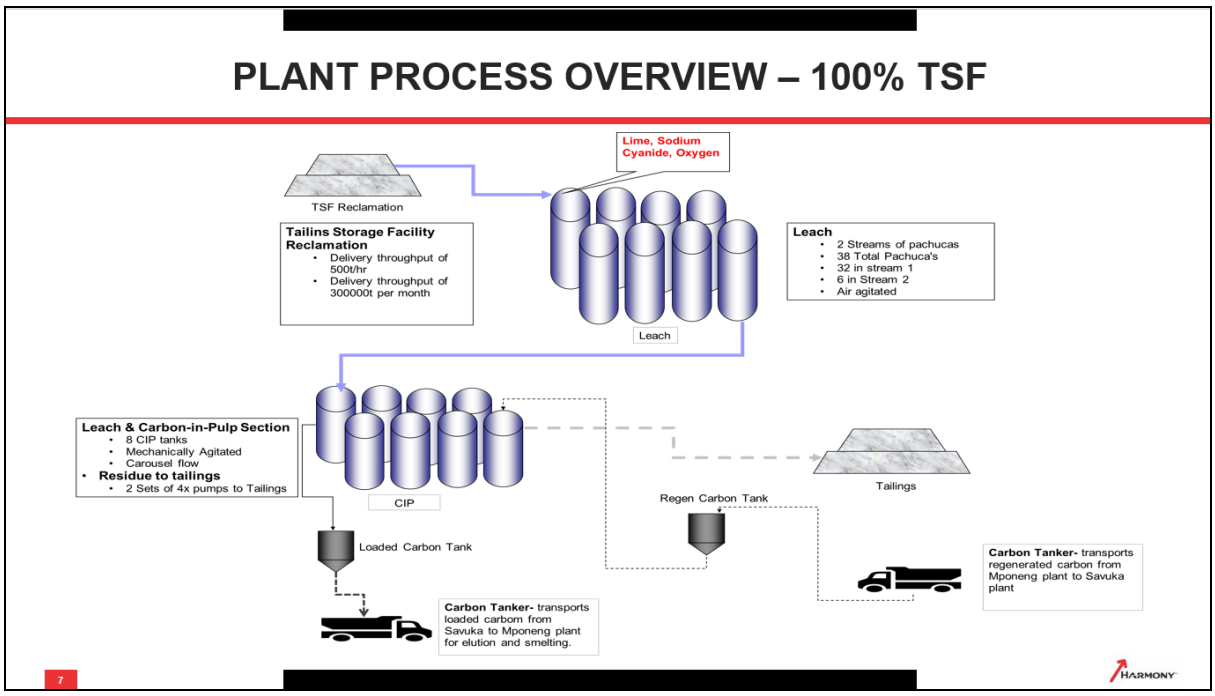
In 2007, the Savuka and Mponeng Marginal Ore Dumps (MODs) were introduced as additional feed sources to Savuka Plant. All these feed sources were undergoing Crushing, Milling, Thickening, Leaching and Adsorption Processes. In 2015, Tailings Reclamation Material from the old dormant dam was introduced, and Tautona and Savuka Mine feed sources were discontinued.

On the 1st of October 2021, Savuka Plant transitioned to 100% TSF (Tailings Storage Facility) processing plant. The TSF material is fed into the sampler tank, where the slurry is preconditioned by adding lime before cyanide addition. The slurry is then pumped to the pulp sump through the cyanide dosing point, where cyanide is added. Liquid sodium cyanide is used and delivered by bulk tanker from ICMI-certified cyanide producer, Sasol South Africa (Pty) Limited to Savuka's bulk sodium cyanide storage tanks. The average WAD (Weak Acid Dissociable) Cyanide content of the TSF Reclamation material averages 0.023 ppm, which excludes it from being classified as a cyanide facility.

The leach circuit consists of 2 process streams. Stream 1 consists of 32 pachucas, and Stream 2 consists of 6 pachucas. Sodium Cyanide (NaCN) is added to the circuit for the purpose of gold dissolution. The Pump-cell adsorption circuit consists of 8 mechanical

agitated vessels. Granulated carbon is used as the adsorption medium. The carousel feed system is used on the pump-cell plant, with 1 vessel constantly off-line. The low-grade slurry (residue) is then screened for fine carbon and transferred to the residue tanks, where it is pumped to the Tailings Storage Facility (TSF).

The loaded carbon is screened from the pulp and transported to Mponeng Gold Plant by road. Gold recovery from the carbon is completed at Mponeng Gold Plant, and the regenerated carbon is transported back to Savuka Gold Plant. The Tailings Storage Facilities (TSFs) vary in age, some being long-established. The TSFs are raised using the paddock and day wall system. This is the typical method used by the plants in the area.



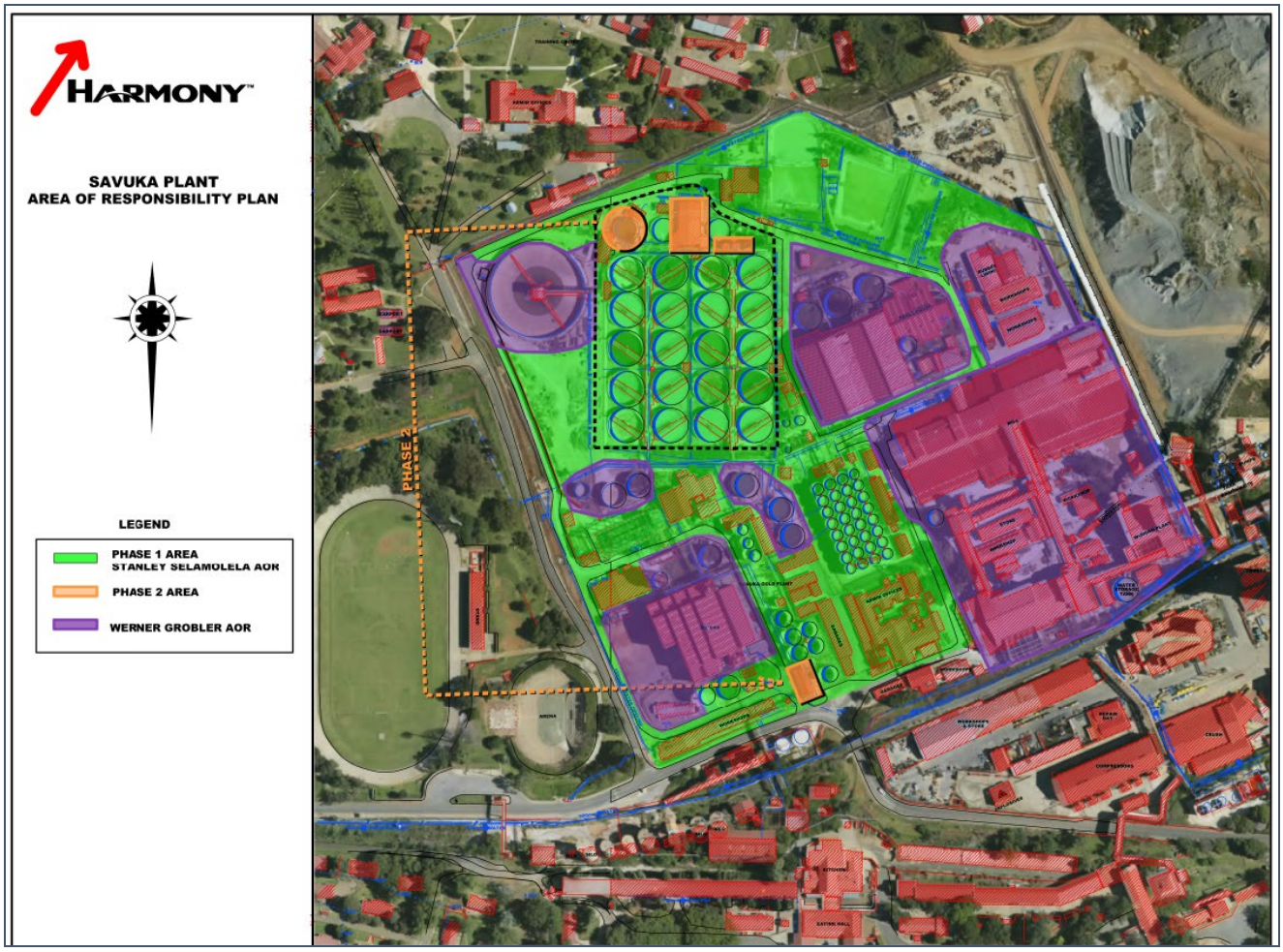
Picture 1: Plant Process Flow Diagram

Currently, about 65% of the Savuka Plant is under demolition, and the remaining footprint comprises of:

- Leaching circuit
- Adsorption circuit
- Residue section
- Cyanide storage area
- Lime Slaking area

The second phase of the TSF Reclamation expansion project is to relocate the cyanide storage tanks from the redundant areas of the plant to the operational part of the plant, which will be near Stream 2. (Indicated by the Orange shaded areas and arrow on Picture 2 below)

In Picture 2 below, the purple shaded areas depict the plant's sections that are being demolished. The green-shaded areas are still in operation until April 2028, when the life of mine comes to an end.



Picture 2: Savuka Plant Area of Responsibility Plan

Auditor's Finding

This operation is

X in full compliance

☐ in substantial compliance

☐ not in compliance

with the International Cyanide Management Code.

This operation has not experienced any compliance issues during the previous audit cycle.

Audit Company: Eagle Environmental

Audit Team Leader: Arend Hoogervorst

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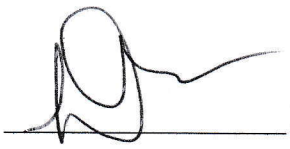
Names and Signatures of Other Auditors:

Name: Dawid M. L Viljoen Signature  Date: 6/10/2023

Dates of Audit: 20th – 24th February 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.

Facility	Signature of Lead Auditor	Date
Harmony Savuka Gold Plant		6/10/2023

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
There is a Harmony Group contract (which includes Savuka Plant) with Sasol South Africa (Pty) Limited (Sasol) in place for the purchase of liquid sodium cyanide. Harmony only purchases liquid sodium cyanide from Sasol. Sasol is a certified cyanide producer, and Sasol was confirmed as fully compliant on the ICMI (International Cyanide Management Institute) website on 7th March 2022. As the cyanide production facility is fully certified, and Savuka only purchases cyanide from Sasol, the principle is 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:
The operation has full chain of custody records identifying its transporter and supply chain. One set of documents was sampled for each year in 2021, 2022 and 2023. The documents sampled included: - the Harmony Purchase Order for the shipment, the Sasol Delivery Note - Dangerous Goods Declaration, the Sasolburg Operations Site Services Laboratories Certificate of Analysis, the Sasol Delivery Note Document, the Sasol Tax Invoice, and the Tanker Services Food and Chemicals/Imperial Logistics (Tanker Services) Delivery Note.
The transporter is Tanker Services, which was recertified as a Code compliant transporter on 1st April 2022.

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:
The Sasol cyanide offloading inspection report for Savuka Plant dated 7th December 2022 by Sasol Technical Specialist, Mosala Mokoena, was sighted. The Plant scored 99 % compliance. The inspection for 2021 was not done due to COVID-19 restrictions.
The Structural Engineer's inspection report, which included the cyanide offloading and storage facilities, was sighted. There were no concerns raised about the offloading and storage facilities. The cyanide offloading and storage facilities were inspected during the site visit and found to be in good condition with the correct signage.
The offloading and storage areas for the liquid sodium cyanide are contained, fenced off, with restricted access, bunded area and bund walls installed, and no public areas nearby. There are no surface waters or drainage to surface waters in the vicinity of the cyanide storage area.
The offloading area for the liquid sodium cyanide is on a concrete surface equipped with humps, kerbs, walls and drains to contain any spills. The drainage for this area is to a spillage sump equipped with a pump, which delivers any liquid into the main bund area for the sodium cyanide storage tanks, from where it can then be pumped into an appropriate stage of the process. The tanker parking offloading bay is well maintained, with no cracks observed. Cyanide storage tanks are located within a steel framework above a concrete, bunded area. This was verified by the auditors during the site

inspection. The cyanide storage tanks are located within a concrete bunded area, which acts as secondary containment. Spillage pumps are located within the bunded area. Flood tests on the Cyanide Storage Bund Area are conducted annually, and the test reports were checked for 2022 and 2021. (The 2020 test was not done due to Covid-19 restrictions.). The liquid cyanide storage tanks are not close to any incompatible materials and are situated in a bunded area to prevent the release of any liquid cyanide into an area where it could mix with any incompatible materials.

Savuka Gold Plant only uses liquid sodium cyanide, which is delivered by a bulk tanker. No solid cyanide is stored on site. Cyanide storage tanks are equipped with ventilation pipes to prevent the buildup of hydrogen cyanide gas. The liquid cyanide storage tanks are located in a fenced and locked area. Access is controlled via a "Cyanide Key Control and Register" procedure. The key control register was sighted, and entries from 11 January 2022 to 19 February 2023 were sampled. In addition, all cyanide storage tanks are located within the Gold Plant, with access being strictly controlled and the plant is surrounded by 3 m fences and razor wire.

The cyanide bulk tanker is met outside the plant security gate by the Cyanide Offloader and checked using a checklist, including the vehicle and the tanker, for driver and vehicle licencing, brakes, fire extinguishers, couplings, possible leaks, tyre condition, and the waybill.

The following procedures were observed, which show how the cyanide storage tanks are prevented from overfilling: -

- The Off Loading of Sodium Cyanide (NaCN) procedure: -
  - Section 3.2.6 states that the responsible offloader must determine the cyanide storage tank levels, record them on the checklist, and may not off-load if the level of the receiving tank is 50 % or higher. At 80%, the air valve will close automatically. The air valve is interlocked with the level. A 24-ton cyanide tanker is equivalent to 38.4%, and each tank will increase by 19.2%. Trends are to be taken before and after offloading to ensure proper calibration.
- "High Cyanide Storage level alarm sound" procedure contains the following points: -
  - The alarms are to be tested for operability.
  - The Shift Foreman will assess the situation, and if there is an anomaly, react accordingly.
  - If the alarm sounds continuously for longer than 10 seconds, this denotes an emergency condition and must be responded to immediately by the appointed cyanide personnel.
  - The tank level instrumentation is checked as part of the DMS (proprietary name) planned maintenance system (PMS).

Monthly instrument technician inspections are carried out on the Level Transmitters. The inspection checklist includes: - Probe, cable, instrument values, clean and replace probes, check reporting to SCADA (**S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition), check signal cable, and calibrate. The appropriate PMS (Planned Maintenance System) records were sampled.

There are Engineering Procedures in place, namely "Servicing of cyanide tanks level transmitter" and "Maintaining the cyanide tank level elements".

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:
During the site inspection, it was confirmed that liquid sodium cyanide is delivered in Tanker Services bulk tankers from the Sasol Production Plant to the Savuka Plant and offloaded directly into cyanide storage tanks. No solid cyanide is used on the plant; therefore, the only containers are the bulk tankers.
With respect to clean up of cyanide spills and residues, the "Off Loading of Sodium Cyanide (NaCN) procedure" contains the following: -

- Section 4.33 The driver must wash the outer surface of the road tanker, the off-loading hose, and all openings that are closed with blank flanges, with copious amounts of water, before departing from the hazardous area.
- Section 4.34 The driver must wash all tools, equipment, off-loading gaskets and protective clothing used during the off-loading process.
- Section 4.35 driver must secure the off-loading tools and equipment to the tanker.
- Section 4.36 The responsible person must remove the PPE. (Personal Protective Equipment) that was worn during the off-loading procedure and thoroughly washed.

The "Off Loading of Sodium Cyanide (NaCN) procedure" details the operation (attachment and removal) of all valves and couplings during the offloading process. (The hosing and the couplings on the hosing are the maintenance and inspection responsibility of the transporter and the tank pipe and pipe coupling are the maintenance and inspection responsibility of the plant.) In extreme cases, the procedures, "Handling and detoxification of cyanide spillage", and "Using Ferrous Sulphate", would be used.
The "Off Loading of Sodium Cyanide (NaCN) procedure" includes PPE requirements and specifies the use of a buddy.
Section 5.2 – Buddy, states, "When work is conducted on, or in any cyanide equipment or in a cyanide area, at least two fully trained (for cyanide) and competent persons are required for the task. One person will carry out the work in full PPE (Personal Protective Equipment).
Section 6.2 Buddy, states, "When work is conducted on or in any cyanide equipment or in a cyanide area, at least two fully trained (for cyanide) and competent persons are required for the task. One person will carry out the work, in full PPE as required, while the second person will remain outside of the hazard or work area. This second person,

referred to as the "Buddy", is also fully equipped with and has donned the required cyanide PPE and will observe the person carrying out the work at all times while that person is inside the hazard/work area. In the event that the person carrying out the work is exposed to cyanide or cyanide reaction products, the "Buddy" will immediately respond to the emergency situation." This is further backed up by the Buddy System procedure. The "PPE Protection Levels" procedure describes the type of cyanide PPE (level protection 3, 2 and 1) to be worn when performing certain tasks involving cyanide, cyanide equipment, or working within the cyanide storage area.
The January 2020 Sasol abbreviated SDS (Safety Data Sheet) confirmed that the sodium cyanide delivered is a light to dark red coloured liquid with an almond smell. Sasol, the cyanide producer, adds the dye during the production process. The Plant does not add any dye to the cyanide solution.

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:
Savuka Gold Plant has the following procedures: 15 x Cyanide Administrative Procedures, 13 x Cyanide Emergency Procedures, 17 x Cyanide Engineering Procedures, 12 x Cyanide Inspection Procedures, 11 x Cyanide SHE (Safety, Health & Environment) Procedures, 12 x Cyanide Operational Procedures, 17 x Scenario (Emergency) Procedures, and 2 x Environmental Procedures, giving a total of 97 cyanide procedures. There are 10 x Intasol TSF procedures and a COP (Code of Practice) - Mine residue deposits, Savuka Gold Plant document.
The Savuka Gold Plant COP (Code of Practice), Reference Number: WS_COP_GEN_002, is a legal requirement. This Code of Practice was drawn up in accordance with Guideline Reference DMR (Department of Mineral Resources) 16/3/2/5-A1, issued by the Government Chief Inspector of Mines on 30 November 2000, DMR Mine Code number 10713. Also in place is the TSF Operational Manual, Harmony Gold Mine Savuka Plant, Document No: ITS_MAN_0001_OPS 2, dated November 2021.
Savuka's TSFs are subject to annual audits by a professional engineer. The Harmony West Wits Operations, Savuka 7 Tailings Storage Facility, 2021 Annual Audit Report, signed off by Rynier Shields, Pr. Eng., was sighted. However, Quarterly Meetings and

Reports are used to guide detailed operations and are overseen by a Geotechnical Engineer. The Harmony Gold Mining Company Limited, Harmony West Wits Operations Savuka 5A and 5B Tailings Storage Facilities, Third Quarterly Report for 2021, September 2021, signed off by Ljiljana Nedeljkovic, Pr. Eng., was sighted. The Harmony Gold Mining Company Limited, Harmony West Wits Operations Savuka 7A and 7B Tailings Storage Facility, Third Quarterly Report for 2021 September 2021 signed off by Ljiljana Nedeljkovic, Pr. Eng., was sighted. The Harmony Gold Mining Company Limited, Harmony West Wits Operations Savuka 5 Tailings Storage Facility, Third Quarterly Report For 2022 September 2022, signed off by Rynier Shields, Pr. Eng., was sighted. The Harmony Gold Mining Company Limited, Harmony West Wits Operations Savuka 7 Tailings Storage Facility, Third Quarterly Report for 2022, September 2022, signed off by Rynier Shields, Pr. Eng., was sighted. The Harmony Wes Wits Operations Savuka 5 Tailings Storage Facility Fourth Quarterly Report for 2022, December 2022, Harmony West Wits Operations Savuka 5 Tailings Storage Facility Fourth Quarterly Report for 2022, December 2022, was sighted, and the Harmony Wes Wits Operations Savuka 7 Tailings Storage Facility Fourth Quarterly Report of 2022 December 2022, was sighted.

The TSF freeboard is regularly reviewed on an annual basis and is commented on in the Annual Audit Report. Sighted Harmony Gold Mining Company Limited, Harmony Wes Wits Operations Savuka 7 Tailings Storage Facility, 2021 Annual Audit Report, signed off by professional Geotechnical Engineers. The legal freeboard requirements are as follows: -

a) 1:50-year, 24-hour rainstorm plus 800 mm additional freeboard.GN (Government Notice) 704(6)3 National Water Act (NWA).

b) 1:100-year, 24-hour rainstorm, plus 500 mm additional freeboard. GN R527(73)4, Mineral and Petroleum Resources Development Act (MPRDA).

The Intasol HMS (Hazard Management System) report for February 2023 tracks freeboard:

- Dam 5 A Legal requirement - 1.40m, actual freeboard - 1.64m.
- Dam 5 B Legal Requirement 1.38m, actual freeboard - 1.47m.
- Dam 7A Legal requirement 1.34m, actual freeboard - 1.47m.
- Dam 7 B Legal requirement 1.38m, actual freeboard - 1.47m.

Daily Operational Reagent Strength Cyanide Storage Facility inspections are carried out by the Reagent Foreman. The inspection file for 2022 was sighted and reviewed. The Shift Foremen do the operational shiftly inspections of low-strength cyanide solution facilities. Faults are reported on the shift log sheet and are reported by exception. Job requests are submitted to the Engineering Department for repairs, and the fault is recorded in the DMS (proprietary name) PMS (Planned Maintenance System) system for record and follow-up purposes. This is covered by the procedure, "Shifts cyanide facilities inspection".

The cyanide plant inspections list covers pumps (drip-free, no crystallization), Pipelines and valves (flange covers, colour coding, intact, no crystal formation), Bulk storage (tank leaks, bund level and condition), Bund walls (spillage, cracks,), Secondary containment (crystal formation on pipes, intact, colour coding and flow direction, leaks and dripping), Antipollution dam levels (levels and condition) and wildlife mortality. These inspection

checklists include checking for leaks, crystal formation, cracks, evidence of corrosion, and wildlife mortality. Files were sampled and reviewed, including 2021, 2022, and 2023 inspections.

Safety Officer inspections of all the plant sections are conducted using the electronic PIVOT (proprietary name) SMS (safety management system). The Safety Officer demonstrated the system, including detailed checklist templates for use with the different inspections. The checklists are person-specific, and records require action, assignment to a specific person and closeout by the responsible person. The Safety Officer's legal inspections are done on 30-day, 60-day and 90-day cycles.

Intasol conducts daily inspections, bound in monthly books (FV-PI-Tailings Daily diary). The inspections include monitoring for bird mortality. The monthly books for December 2021, March 2022 and January 2023 were sampled. Quarterly inspections and reporting by Jones and Wagener (Consulting Engineers) have been conducted since the takeover from AGA (AngloGold Ashanti). The annual TSF Audit is also conducted by Jones and Wagener. Daily pipeline inspections are conducted by Intasol: Inspection Reports were sampled for 10/10/2021, 14/10/2022, 17/10/2022, 16/2/2023, and 14/3/2023.

The TSF pipelines, pumps and valves form part of the DMS PMS maintenance system. DMS Maintenance work orders for the Residue line, return water pumps and valve repairs were confirmed. The Weekly inspection file was confirmed signed, and the 11/01/2023 was sampled. It included reporting seepage between stations 8 and 9, which was reported to Intasol Management, Harmony Management and the Consulting Engineer. Also sampled were the reports of 12/08/22 and 28/02/21(no comments).

Monthly Inspections are conducted, and the checklist includes: - Solution trenches and bridges, Underdrains, Catchment paddocks, and the tailings delivery system. Inspections dated 30/4/2022, 31/1/2022, and 31/12/2021 were sampled. The weekly Return Water Dam (RWD) inspections were sighted, which included capacity/storage level, RWD wall, condition of pumps, pipes and valves, and any evidence of seepage and erosion. Records for 2021, 2022 and 2023 were sighted and sampled. (Sampled 3/12/21, 7/1/2022, 11/2/22, 8/7/22, 3/2/23,10/2/23, 13/2/23, 3/12/21, 8/6/23) HMS (Hazard Management System) database reports are compiled from daily data and reports and issued monthly. HMS reports for 2021, 2022, and 2023 were sampled. Electronic exception reporting is done on cell phones by the Pipe Patrol Supervisor to the WhatsApp group, which includes Harmony and Intasol Managers. A demonstrated example on a cell phone of a pipe leak at TSF 5 was sighted.

The Cyanide Management Change Management Procedure for Savuka Gold Plant was sighted. The procedure includes the following: -

Section 2.8, "…Step 7: Authorising the Change Plan requires sign off by SHE officials as per the table.2…" No changes requiring implementation of the Change Management procedure were carried out. No changes were made to the TSF design and construction, which increases the risk of cyanide releases or exposures. The TSF operations are further covered by reports done by the professional Engineer of Record, Jones and Wagener, consulting engineers.

There are several Cyanide Management procedures that can assist with non-standard operating situations: -

- The "High Cyanide Levels are Measured in The Residue Slime, Savuka Gold Plant" procedure states that if WAD cyanide is above 45 ppm, the dilution water will automatically open and dilute the WAD cyanide solution. The shift foremen must monitor the situation and notify the TSF Management accordingly.
- The "Cyanide Related Activities and Power Failures" procedure states that all cyanide-related work and cyanide off-loading is to stop during power failures due to the mandown alarm not working.
- The Emergency Procedure, "Riots, Strikes or Industrial Unrest Procedure - Savuka Gold Plant", will address both listed and other abnormal scenarios.

If a temporary cessation of operations is due to another unforeseen emergency event, or upset in the operational water balance, this will be managed in accordance with the Emergency Preparedness and Response Plan and Procedures. The plant will be stopped for planned shutdowns as per standard procedures for stopping and starting the plant.

The SAP (proprietary name) PMS (Planned Maintenance System) system was replaced by the Harmony DMS (proprietary name) Planned Maintenance system in March 2021, following the change of ownership from AngloGold Ashanti (AGA) to Harmony during October 2022. At the time of the change of ownership, Savuka was a fully Cyanide Code-compliant mining operation. The DMS PMS system covers the whole of the Savuka Gold Plant and its associated TSF (Tailings Storage Facility). Most key equipment data from the SAP system was transferred to spreadsheets and imported to the DMS system. Although some data was lost in the transfer, the Savuka Maintenance Planner is confident that the continuity of data has been maintained.

The DMS includes job cards on equipment inspections, repair and replacement requirements and completion and close-out of works orders. Any maintenance items identified during the operational shift inspections are reported to the Maintenance Department using a Job Request and are discussed, as well as dealt with during the morning emergency meetings between Operations and Maintenance Foremen. Planned maintenance is carried out through inspections by Boilermakers (monthly, six monthly and annually), Fitters (weekly and monthly), and Instrument technicians (weekly, two weekly and monthly).

A sampled electronic review of the DMS PMS system was carried out. Various planned inspections were sampled electronically, and the artisan's completed hard copy documentation was sampled and reviewed. Savuka Plant inspects under the following categories: -

Tanks

The boilermakers conduct visual inspections on tanks, looking for cracks and leaks, welding failures, corrosion and gasket failures in the tanks, cracks in tank foundations and any tests carried out on the cyanide tanks by Wearcheck (specialist thickness testing sub-contractor). The Wearcheck Report No 104172, dated 20 December 2022, was sampled. The following boilermaker inspections were sampled: - Cyanide Tank 1 – boilermaker monthly inspection no P0019386 dated 7-2-2023 – no faults detected; Cyanide Tank 2 – boilermaker monthly inspection no P0019398 dated 7-2-2023 – no faults were detected; Pachuca tank boilermaker twelve-monthly inspection no P0019180 dated 31-1-2022 – no faults were detected; Standard Leach Tank boilermaker six monthly inspection no P0016882 dated 28-9-2022 – no faults were detected.

Secondary Containments

Secondary containments and bunds are not included in the DMS PMS system but are covered in operational inspections.

Leak Detection

No leak detection or collection systems on the operation are covered in the DMS PMS system.

Pipelines, pumps and valves

All pipelines, pumps and valves are included in the DMS system. Pipeline and valve inspections are often linked to specific pump inspections. The daily TSF pipe patrol is triggered by a work order from the DMS. Checks include: - visually inspect for missing bolts and nuts on flanges; visually inspect valves for leaks; visually inspect for pipe leaks; inspect for theft of company property; check return water dam levels; check the condition of the fence at the pump station; inspect for intruders on company property; and check that pumps are running. The work order to the TSF foreman is a weekly inspection, but includes daily inspections for the seven days of the week. The Weekly TSF pipeline inspection, PS 00196841, dated 9-2-2023, was sighted.

In the plant, the fitter conducts monthly visual inspections of the cyanide pipelines, looking for leaks, corrosion or other signs of failure. The Fitter monthly cyanide pipeline inspection, no P0019376, dated 6-2-2023, was sighted. Lower strength pipelines form part of operation inspections but, from an engineering point of view, are done to failure. All pipelines on the plant are subjected to yearly thickness testing. A Quest (proprietary name) Thickness Testing Report No QTS-2022-GP-2603-N carried out on the Residue Tailings pipeline (27-7-2022), Leach 2 to CIP (Carbon in Pulp) outlet pipeline (20-7-2022), Stream 2 to CIP suction pipe column (20-7-2022); Stream 2 to Leach 2 pipe column (21-7-2022); and Stream 1 to Leach 1 pipe column (21-07-2022) was sighted and reviewed.

The fitter carries out various pump inspections. Items checked include: - check for oil leaks, condition of guards, motor and pump holding down bolts, condition of V-belts, leaks, and the condition of associated pipes and valves. Sampled: - Fitter weekly Cyanide No 2 pump, PS 0019668 on 20-2-2023 – no faults detected; Fitter monthly Sump spindle pump inspection P0019354 dated 6-2-2023 – no faults detected; Weekly Fitter residue pump inspection P0019156 dated 31-1-2023 – no faults detected; Monthly Fitter Leach Pump inspection P0019049 dated 26-1-2023 – no faults detected. Fitter monthly PCD pump (centrifugal/axial) inspection P0019114 dated 26-1-2023 – no faults detected. The TSF pipelines, pumps, and valves form part of the DMS maintenance system. Intasol conducts daily inspections of all tailings pipelines and valves from the plant to the TSF and on the TSF footprint.

Pond and Impoundments

On the TSF, freeboard is measured by Intasol every month, and independent surveys are done quarterly and reported in the HMS dashboard and quarterly reviews. It was confirmed that freeboard measurements are in the HMS reports. The Harmony Savuka Plant, TSFs, Monthly Dashboard, 31 January 2023, was sighted confirming freeboard graphs. Return water dam levels are recorded and measured daily using the level plates in the dam. Levels are recorded on the WhatsApp group to Harmony and Intasol

Management. The WhatsApp report by the TSF Site Manager includes: - South Dam, North Dam, Antipollution Dam, Flow meter readings, and rainfall.
With regard to inspection frequencies, the shift foreman conducts shiftly cyanide facility inspections, and the Reagent Foreman conducts daily cyanide storage facility inspections. The Safety Officer's legal inspections cover the whole plant over a period of 90 days. The DMS PMS requires planned inspections covering daily, weekly, monthly, quarterly, 6 monthly and annual frequencies. The SIMM (Structural Integrity Management Monitoring) structural inspections are done annually. Inspections on the TSF are conducted as per the COP (Code of Practice) requirements and Intasol procedures. Daily wildlife mortality inspections are conducted. Intasol inspections cover daily, weekly, monthly, and quarterly inspections. The inspection frequencies are deemed sufficient to assure and document that facilities are functioning within design parameters.
It was confirmed that DMS PMS inspections are documented in hard copy and electronically, including the date of the inspection, the name of the inspector, any observed deficiencies, the nature and date of corrective actions documented, and records are retained. It was confirmed in the review and sampling of the operational inspections' records that the inspections are documented, identifying specific items observed, name of the inspector, deficiencies, nature and date of corrective actions.
Indications are that no emergency power is required to prevent overtopping of the return water dams. However, standby pumps are installed on the Pollution Control Dams (PCDs) and the standby pumps and generators are included in the DMS PMS system.

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

	X in full compliance with
The operation is	□ in substantial compliance **with Standard of Practice 4.2**
	□ not in compliance with
	□ not subject to

Basis for this Finding/Deficiencies Identified:
A Cyanide optimisation program is in place, which includes "analyse and improve", Metallurgical Process Work Management, Bottle roll and diagnostic leach testing, Pilot leach test works using a laboratory scale leach Pachuca, and air agitated to simulate actual leach conditions.
The maintenance of the TAC1000 cyanide analyser and Cynoprobe on-line cyanide analyser is on DMS PMS system. Daily releach tests are done to determine any leachable gold losses and if leach parameters are adequate. The test for 17 February 2023, indicating more contact time was required, was sighted. Diagnostic leach tests are done on residues to diagnostically identify the distribution of gold in residue. The Metmin (proprietary name) report 2021/1863, dated 6 September 2022, indicating additional extraction of 4.85% with most of the gold included in sulphides, was sighted and

reviewed. Basic recovery tests on head samples are done to determine the recoverable gold in the feed.
Pilot Pachuca tests are done quarterly, and tests for September 2022 and December 2022 were sighted and reviewed. The tests include cyanide optimisation, and the indication is that 300 g/t (grams per ton) NaCN (sodium cyanide) consumption and 118 ppm NaCN in leach 1 is optimal. The cyanide addition setpoint is adjusted based on the leach profile. This is documented in the Procedure, "Cyanide Dosing Amendments". The leach cyanide profile, both streams and the CIP (Carbon in Pulp) were sighted and are done monthly. The terminal cyanide was around 48 ppm Free Cyanide, and CIP tailings at 42 ppm NaCN (Jan 2023).
An online TAC1000 free cyanide analyser measures free cyanide and controls the additions. Free cyanide is measured in the leach head tank. Cyanide dosing control is done based on the TAC free cyanide readings sending a signal to a variable speed reagent dosing pump feeding into the leach feed dosing point.
Manual backup titrations are done to check the TAC1000 readings and identify any malfunctions. Significant variances between the manual and TAC1000 are investigated, including testing the standards of the TAC1000. The service providers for the TAC1000 and the Cynoprobe are called out as per their contract on an emergency basis.

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:
Harmony took over the Mponeng and Savuka Mines in October 2020. The Probabilistic Water Balance (PWB) model was converted from the AGA (AngloGold Ashanti) Cyanide Code compliant systems to a new Model ETA (proprietary name) Operations Process Toolbox (PTB) and is probabilistic because it accounts for the natural variability and uncertainty of precipitation and evaporation. The model is updated and run every month.
A detailed water supply/demand water balance for the whole West Wits Region, including Savuka Plant and TSF, and Mponeng Plant and TSF, was sighted. The Model includes the Mponeng plant as well as the Mponeng TSF, holding dams and return water dams, and the Savuka Plant Return Water Dam (RWD), stormwater dam, PCD (Pollution Control Dam), Coffer and North boundary dams.
The PWB model includes the following:
- Evaporation - assumption for the area
- Rainfall – real time obtained from site rain gauges
- Design Storm duration of 1: 50-year, 24-hour storm event of 50mm, and 1:100-year 24-hour storm event of 75mm.

- Seepage - Assumption of 1% of the total volume
- Interstitial water - Theoretical formula
- Water in the tailings feed to the TSF - daily data from plants
- Volumes of the return water dam (North 35,245m^3, South 29,313m^3) and the stormwater dam (417,545m^3).

There is no run-on to the TSF and the holding dams, no allowable discharges to surface waters, and freezing and thawing conditions do not generate sufficient accumulation of precipitation to affect PWB conditions. The return water dam will receive rain from the TSF during power outages or equipment failures. The model showed and demonstrated that there is sufficient capacity to accommodate the inflow from the TSF if the stormwater dam is 60 % full for 1:100 year and 80% full for 1:50 year storm events. Any overtopping of the stormwater dam will be treated as an incident and investigated by the Environmental Department as per their incident investigation procedures.

The WAD cyanide in the Storm Water Dam is analysed. It contains less than the limits of detection of 0.020 mg/l WAD cyanide. Thus, the Storm Water Dam is not classified as a cyanide facility, as per the ICMI definitions.

The Intasol daily inspections and HMS (Hazard Management System) data system include inspections and monitoring to maintain the operational parameters, including freeboard limits. Dam level monitoring is incorporated in the model: the Return and stormwater dams in the TSF, the PCD (Pollution Control Dam) in the plant, the Coffer dam and the North Boundary dam. These were confirmed in the demonstration of the PWB model and the document 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:

WAD cyanide is measured by online Cynoprobe sampling from the plant tailings tank before being pumped to the Savuka TSF compartments in use. The Cynoprobe takes a sample every 15 minutes, and the results are automatically sent to the SCADA (**S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition) system, where the daily averages, minimums and maximums are calculated. The graphs sighted were the daily averages from the SCADA system.

Sighted WAD cyanide values in graphic form for: -

- **October 2020 to September 2021**: No exceedances over 50 mg/l WAD cyanide were recorded for the 12 months.
- **October 2021 to September 2022**: No exceedances over 50 mg/l WAD cyanide were recorded for the 12 months.

- **October 2022 to February 2023**: No exceedances over 50 mg/l WAD cyanide were recorded for the 5 months.
Samples from the North Boundary dam, WWS21 samples, 1 October 2021 to 31 January 2023 were sighted where all values are less than the limits of detection of 0.020 mg/l WAD cyanide and thus, the dam is not considered a cyanide facility. The North Boundary dam is the last point before leaving the property on the North boundary. The Pollution Control Dam samples indicate that WAD cyanide levels do not exceed 50mg/l. A data review between 2020 and 2023 shows most readings were below 1 mg/l with a few outliers between 4 and 8 mg/l WAD cyanide.
A maintenance contract is in place with MINTEK (Mintek is South Africa's national mineral research organisation) for calibration and repairs of the Cynoprobe WAD analyser. The SANAS (South African National Accreditation System) certificate of analyses for WAD cyanide standard solutions was sighted. A MINTEK Cyanide Centre services record, project MCC-41106, dated 20/12/2022 for the Cynoprobe WAD Analyser, was also sighted.
The Cynoprobe WAD Analyser and the TAC1000 (calibrated monthly) analyser are listed on the DMS PMS, but maintenance, repairs and calibrations are reported as carried out by third-party contractors.
The WAD cyanide values are all less than 50 mg/l WAD cyanide in the tailings at the plant, pumped to the TSF. Thus, no measures (e.g., fencing, filling in collection ditches with gravel, and covering or netting solution in ponds and impoundments) are necessary to restrict access by wildlife and livestock to open waters. The Intasol daily inspection checklists, including wildlife mortality observations, were sighted and sampled. No mortalities were observed during the time since Harmony took ownership of the operations. It is thus concluded that maintaining a WAD cyanide concentration of 50 mg/l or less in open water is effective in preventing significant wildlife mortalities.
There are no heap leach operations at the 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 is no permitted direct discharge from the Savuka Gold Plant to surface water. The Plant is short of water and manages input requirements for operational purposes. Any overflows during excess rainfall are treated as an incident and covered by the environmental incident procedure under emergencies. The Environmental Management Systems Emergency Preparedness and Response Manual and the Incident Classification Harmony procedure were sighted and reviewed.

There are no discharges to surface water, and thus, there are no established mixing zones. Samples from the Wonderfontein Spruit (stream), reference number WWS03, indicate WAD cyanide levels are less than the limits of detection of 0.02mg/l WAD cyanide from 1 October 2021 to the current date (31 January 2023). Downstream samples from Boreholes (as per REMIS (**Re**liability and **M**aintainability **I**nformation **S**ystem) MAP in downstream boreholes of Savuka TSFs are:
- NB6 1 October 2021 to current 31 January 2023
- NB8 1 October 2021 to current 31 January 2023
- NB42 1 October 2021 to current 31 January 2023

All downstream borehole samples indicate that WAD cyanide levels are less than the limits of detection of 0.020mg/l WAD cyanide. There were no instances where the downstream river or borehole samples exceeded 0.02 mg/l WAD cyanide. Therefore, no remedial action has been required to prevent further degradation.

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

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

There are no identified beneficial uses of groundwater immediately down-gradient of the TSF operations. The REMIS system is used to indicate monitoring points. The system graphs the data for each monitoring point. Samples are analysed for free and WAD cyanide and dissolved cyanide to the limits of detection of 0.020 mg/l. Groundwater flow was modelled for the whole Mponeng Operations (including Savuka) to examine pollution plumes. GCS Consultants provided a surface map and report. Their 2019 hydrological model is available (GCS project number: 19-210 dated 12 Aug. 2019), indicating that sulphates are the major pollution plume issue.

Water is pumped back from return water dams for re-use at Reclamation. There is no lining for the TSF and the return water dams because the infrastructure was established prior to current legal requirements. The Savuka TSF solution trench is there to prevent seepage and is partially lined. Other trenches around TSFs are maintained to ensure good flow to the dams.

No numerical standard is established by the applicable jurisdiction for WAD cyanide or any other species of cyanide in groundwater. Therefore, there are no compliance points below or down gradient of the gold plants or tailings facilities. Groundwater monitoring is undertaken to establish whether the tailing facilities are having an impact on the surrounding groundwater. Groundwater borehole monitoring is undertaken twice per year. Down-gradient monitoring records were sampled in the REMIS System:

Downstream sample from Boreholes (as per REMIS MAP) in downstream boreholes of the Savuka TSFs:

- NB6 1 October 2021 to current 31 January 2023
- NB8 1 October 2021 to current 31 January 2023
- NB42 1 October 2021 to current 31 January 2023
- NB57 15 October 2021 to current 13 October 2022

All downstream borehole sample indicates that WAD cyanide is less than the limits of detection of 0.020mg/l WAD cyanide.
An upstream sample between the Savuka TSF and the adjoining Blyvoor Mine TSF is also sampled:
- NB27 1 October 2021 to current 31 January 2023.

The upstream borehole sample indicates that WAD cyanide is less than the limits of detection of 0.020mg/l WAD cyanide.
The backfill plant was decommissioned in October 2017 and, therefore, falls outside of the scope of this audit. No evidence of groundwater contamination by cyanide was observed in the borehole samples; therefore, no remedial action was necessary.

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:
During the site visit, it was confirmed that the Plant was designed with "spill collection only" bunds around cyanide tanks, CIP tanks, and spillage aprons for the Leach tanks and residue section. Leach Pachuca Tanks are placed on steel legs and plinths, with CIP (Carbon in Pulp) pump cells residue tanks on solid concrete bases. Cyanide storage tanks are placed on steel legs and plinths inside a concrete bund. The low-strength cyanide areas spill prevention and secondary containment system consists of concrete channels, routing spills to the anti-pollution dam system, consisting of three concrete and rock-lined dams.
Secondary containment for tanks is sized to hold a volume greater than that of the largest tank within the containment and any piping draining back to the tank, and with additional capacity for the design storm event, that is: -

- The Reagent strength cyanide bund area is 135 m^3, and the total tank volume is 119 m^3.
- The CIP bund is 110.63 m^3, and the tank volume is 100 m^3.
- The Leach 1 bund is 187.9 m^3, and the largest tank is 334 m^3. The leach spillage apron overflows via concrete trenches to the No 1 and No 2 anti-pollution dams with a combined volume of 2,200 m^3, when empty. These dams overflow to the No 3 anti-pollution dam with a volume of 2,180 m^3.
- The residue tank has a volume of 335m^3. The emergency catchment consists of return dams 1 and 2 (2 x 1 100m^3), and the anti-pollution dam no 1, linked to No

2 and No 3, is 2 180m^3. These dams are all linked to overflow from one to the other. Any overflow from the anti-pollution dam will flow via a silt trap to the North Boundary Dam (328,000m^3).

The total available capacity will be able to handle the design storm event and the volume of the largest tank not equipped with a bund. This was confirmed during the review of the probabilistic water balance. The tanks without bunds are linked via concrete drains to the anti-pollution dams, which act as secondary containment. There are no tanks installed without secondary containment.

The following procedures were observed, which prevent the discharge of any cyanide solution or cyanide-contaminated water that is collected in the secondary containment area to the environment.

- The "Emptying cyanide spillage bund areas" procedure states the process to follow when pumping cyanide or water from the cyanide bund area to the pump sump and then to the Leach. It notes that pH must not be below 10.5 when spilled cyanide is pumped to the process.
- The "Anti-Pollution Dam Procedure - Savuka Gold Plant" states that the pollution control dam must be operated at a level below 30%.

The Cyanide Delivery Line is located within a launder. The process solution pipelines are located above the concreted and bunded plant area. The launders of the reagent-strength cyanide delivery line drain back to the cyanide storage bund area. Cyanide pipelines in the Plant are inspected during the shiftly inspections and are included in the DMS planned maintenance inspections. The pipelines for the Savuka TSF are partly HDPE (High-density polyethylene)-lined as a spill prevention measure. Thickness testing is done on pipelines not made of HDPE and managed via the DMS PMS. Bends (HDPE lines) are inspected. Pipe patrols are conducted daily to identify any leaks timeously, and a report is issued by Intasol. Savuka tailings pipes are placed inside earth trenches to contain spillages with periodic catchment paddocks. No areas have been identified where cyanide pipelines present a risk to surface water.

As per AGA (AngloGold Ashanti) Cyanide Guidance Engineering Design Specification, Chapter 42 of South Africa Region Metallurgy (SARM) Cyanide Code Implementation Guidelines, all pipelines and tanks for containment of cyanide solutions are made of steel, which is compatible with cyanide and high pH conditions.

The "Equipment and maintenance of equipment used with cyanide" procedure requires that pipes are to be manufactured of high-pressure seamless Carbon & Alloy steel pipe Grade A-Yield stress 207 mPa. The procedure prohibits the use of any materials that may be corroded by caustic cyanide solutions. It was confirmed that the plant used mild steel for reagent-strength cyanide pipes, and the cyanide tanks are constructed of 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.*

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
There have been no additions, modifications or construction done on the cyanide facilities since the previous re-certification or since Harmony acquired Savuka from AngloGold Ashanti. The TSF is a continuously changing operation, and the progress is covered by quarterly and annual audits conducted by professional Geotechnical Engineers of Record (Jones and Wagner). Their reports and recommendations are reviewed below, and it is deemed that the reports are produced by appropriately qualified persons to maintain the TSF in a fit-for-purpose condition.
Savuka Gold Plant was constructed in the 1960s as a conventional crushing, milling cyanide leach Gold Plant. Since the Plant underwent significant technology upgrades, conceptual Process Flow Diagram changes, retrofits and currently treat remined slurry from historical TSF sources, no design information is available, and no QA/QC (Quality Assurance/Quality Control) is available. The Savuka Gold Plant was purchased by Harmony Gold as part of the Mponeng West Wits Complex from AngloGold Ashanti in October 2020. The Plant was ICMI Cyanide Code compliant at the time of the sale. The plant maintenance and operational strategy has changed and improved to allow the plant to operate in line with safety and legal requirements, including ICMI compliance.
A complete Structural Assessment by a professional Structural Engineer was commissioned in 2022, and the detailed report was received in February 2023. (Harmony eSIMM (Structural Integrity Management Monitoring Report) report, Savuka Plant Carletonville, dated 20 January 2023 by Jan Hendrik Dykman Pr. Eng. The report identified a number of issues, and a hazard classification was conducted on the issues. The Savuka Plant Management drafted a remediation plan according to the hazard classifications in the Structural Engineers report.
The Structural Report was received, and the high-priority issues were dealt with immediately. The remaining lower priority issues were incorporated into the ongoing maintenance scheduling, and work orders have been sighted indicating the completion target dates of the work. The only two high-priority items identified in the cyanide facilities (a severely corroded bracing and a corroded structural steel beam above the CIP tanks) were repaired by 16 March 2023.
Harmony Savuka Gold Plant has been doing ongoing repairs to the plant structures since 2021 in order to maintain integrity. This includes repairs to the Pachuca top wear zones and the conical Pachuca bottoms. The Final Report, steel patch repair on 3C leach tank, was sighted and reviewed.
Harmony Savuka TSFs are subject to annual and quarterly reviews by professional Geotechnical Engineers. The reports include complete reviews, details of phreatic levels, freeboard, stability considerations, conclusions and recommendations regarding the operability and condition of TSFs 5A and 5B, 7A and 7B. The following reports were reviewed:

- Harmony West Wits Operations, Savuka 7 Tailings Storage Facility, 2021 Annual Audit Report, signed off by Rynier Shields, Pr. Eng.,
- Harmony West Wits Operations Savuka 5 Tailings Storage Facility 2021 Annual Audit Report,
- Harmony West Wits Operations Savuka 5 Tailings Storage Facility 2021 Annual Audit Report.

Conclusions and recommendations TSF 7: The reports included numerous conclusions, with the general conclusion that the Savuka TSF 7 was in poor condition at the start of the review period. However, "… major improvements have been made towards the end of the period with many of the concerns addressed and action plans in place for the remaining areas that need improvement." A new Dam Operating Contractor was employed in September 2021, resulting in the improvements.

Conclusions and recommendation TSF 5: Under synopsis, it was stated: " that in general, the Savuka 5 TSF was in poor condition at the start of the period under review…" Remediation planning will be included in a broader HGM (Harmony Gold Mine) TSF remediation strategy following this report.

The Quarterly Reports provide insights into ongoing changes. Sighted: -

- Harmony Gold Mining Company Limited, Harmony West Wits Operations Savuka 5A and 5B Tailings Storage Facilities, Third Quarterly Report For 2021, signed off by Ljiljana Nedeljkovic, Pr. Eng.
- Harmony Gold Mining Company Limited, Harmony West Wits Operations Savuka 7A and 7B Tailings Storage Facility, Third Quarterly Report For 2021, signed off by Ljiljana Nedeljkovic, Pr. Eng.
- Harmony Gold Mining Company Limited, Harmony West Wits Operations Savuka 5 Tailings Storage Facility, Third Quarterly Report For 2022, signed off by Rynier Shields, Pr. Eng. "…This report is based on the Hazard Management System (HMS) data supplied monthly by Intasol for the period spanning from May to July 2022..." Conclusions and recommendations: A number of conclusions and recommendation were made, with the main conclusion being, "…Once freeboard compliance on Savuka 5A is achieved, the deposition on the facility should be stopped. The facility should then only be used in emergency situations whilst the phreatic surface and drain flow is continued to be monitored monthly. "
- Harmony Gold Mining Company Limited, Harmony West Wits Operations Savuka 7 Tailings Storage Facility, Third Quarterly Report For 2022, signed off by Rynier Shields, Pr. Eng. Conclusions and recommendations: A number of conclusions and recommendation were made, with the main conclusion being "The minimum freeboard was below the legal requirement for Savuka 7A during the review period. A freeboard turnaround strategy is currently being implemented. The freeboard is expected to be legally compliant by the end of September 2022."
- Harmony West Wits Operations Savuka 5 Tailings Storage Facility Fourth Quarterly Report For 2022 - Conclusions and recommendations: A number of conclusions and recommendations were made, with the main conclusion being "…Remedial works on all Savuka compartments have been completed, and thus,

tailings must be deposited as per the deposition strategy developed for the Savuka Complex…."

- Harmony West Wits Operations Savuka 7 Tailings Storage Facility Fourth Quarterly Report of 2022. Conclusions and recommendations: A number of conclusions and recommendations were made, with the main conclusion being, "Noting that freeboard is compliant, and the remedial works have been completed on all Savuka compartments, tailings must be deposited as per the deposition strategy developed for both Savuka TSFs…."

With regard to design criteria, owing to the age (around 50 years) of the plants and TSFs, the original design specifications are not available. However, the Geotechnical Engineers of Record, Jones and Wagener, have confirmed that the TSFs are operated as fit for purpose.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.9**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The "Surface sampling operational procedure", ISO 14001: 2015/8/21/00/2023 AG5 MPO (027), used by the Environmental Department, was sighted. It was confirmed that sampling is done by a contractor, GCS (specialised Geotechnical Consultancy), as per the Harmony procedure, Sampling Procedure for Specialised Speciation and Environmental Samples. The sampling procedure was compiled by a Senior Environmental Officer with a BA Environmental Science qualification and 16 years of field experience.
The sampling procedure specifies the following: -

- Section 5 describes how samples should be taken.
- Where samples should be taken. The REMIS (Reliability and Maintainability Information System) system maps all sample points on Google Maps.
- Sample preservation techniques - Section 4.5 Sample Preservation (including WAD and Free cyanide) and sample storage in a cooler bag in dark bottles.
- Chain of custody procedures and shipping instructions and analyses required (cyanide species to be analysed) are in the procedure, including an example of the chain of custody document as an appendix.
- Quality assurance and quality control requirements for cyanide analyses. The Midvaal Water Company SANAS (South African National Accreditation System) Certificate of accreditation, including analytical methods used, was sighted. This included "4. Method for Determination of Weak Acid Dissociable cyanide by distillation using the Skalar Continuous Flow Analyser" from the Midvaal Water Company Scientific Services Methods Manual.

The electronic field sampling sheet was sighted, including weather, livestock/wildlife activity, and anthropogenic influences, under comments on abnormal conditions.
The groundwater monitoring boreholes are monitored twice a year (1st quarter - rainy season and third quarter dry season) based on advice from the Geohydrologist. The surface water monitoring is undertaken monthly, and specific samples are taken quarterly and annually. The monitoring of WAD cyanide in tailings leaving the Gold Plant is monitored on a continual basis and shown on the SCADA ("Supervisory Control And Data Acquisition") system and recorded. There is a procedure, Monitor Wildlife Deaths. The purpose of this procedure is to assist employees in knowing the steps that are to be followed to monitor wildlife deaths as a result of the metallurgical plant's activities. The auditors deem the frequency with which the surface water and groundwater are monitored to be adequate to characterise the medium being monitored and identify any changes in a timely manner.

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

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

X in full compliance with

The operation is

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The following procedure was sighted, "Cyanide plant decommissioning procedure Savuka Gold Plant ", revision 10, dated 2 August 2022. It stipulates the requirements for cyanide decommissioning activities 12, 6 and 3 months prior to the decommissioning of cyanide-related infrastructure and equipment. Also reviewed was the procedure, "Detoxification of cyanide contaminates and/or redundant equipment and the disposal of cyanide contaminated waste Savuka Gold Plant ", which includes details of cyanide decontamination and decommissioning.
Both the procedures, "Cyanide plant decommissioning procedure Savuka Gold Plant "and "Detoxification of cyanide contaminates and/or redundant equipment and the disposal of cyanide contaminated waste Savuka Gold Plant ", are controlled documents and are reviewed annually.

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:
A Closure estimate by external consultants, Digby Wells, entitled "Savuka Gold Plant - Closure cost assessment closure cost report", June 2022, was reviewed. The Report refers, on page 17, in section 7.2.4, Cyanide Decontamination, to a cost estimate of South African Rands 671,508 included in the mine closure cost estimate for Savuka Plant for cyanide decontamination implementation and is based upon the estimates of a reputable external cyanide cleaning specialist. Closure liabilities are updated annually to take account of any changes at the facilities.
The AGA (AngloGold Ashanti) operations of Mponeng and Savuka (West Wits Mining Operations) were transferred to the control of Harmony (renamed "Mponeng Operations" in October 2020). At the time of the transfer, both Mponeng and Savuka were fully compliant with the Cyanide Code.
Owing to the withdrawal of some AGA guarantees for the AGA Environmental Rehabilitation Trust, during the transition from AGA to Harmony, there was a shortfall between the closure liabilities and the Trust Fund assets. A Resolution by the Trustees of the Bambanani Joel Matjhabeng and Tshepong Rehabilitation Trust (The Trust Fund for all Harmony operations) was sighted, dated 5 October 2020, which noted the shortfall. It was noted that the Bambanani Joel Matjhabeng and Tshepong Rehabilitation Trust had a surplus, which was in excess of the shortfall. It resolved that the shortfall would be covered by the Bambanani Joel Matjhabeng and Tshepong Rehabilitation Trust, and the surplus would be used to fund the West Wits Operations shortfall.
An Income Statement for the AGA Environmental Rehabilitation Trust to the end of January 2023 was sighted, which indicated that owing to investment surpluses subsequent to the takeover of the West Wits Operations, the Trust was in surplus over its liabilities and the support from the Bambanani Joel Matjhabeng and Tshepong Rehabilitation Trust was no longer needed.
The latest accounts for the Bambanani Joel Matjhabeng and Tshepong Rehabilitation Trust for the year ending 2021, signed by the Trustees on 16 May 2022, were sighted. The latest accounts for the AGA Environmental Rehabilitation Trust were due to be published during the processing of the Mponeng and Savuka ICMI certification audit reports. The latest AGA Environmental Rehabilitation Trust Annual Financial Statements for the year ending 31 December 2021, signed by Trustees on 11 May 2023, were sighted.

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 following procedures and documents have been developed describing how cyanide-related tasks at the Plant should be conducted, and these were reviewed:

- "Off Loading of Sodium Cyanide (NaCN)",
- "Equipment and Maintenance of Equipment used with Cyanide",
- "Entry into an identified hot spot area",
- "Working in Confined Spaces at Mines Savuka Gold Plant", Mandatory Practice for the Management of Working in Confined Spaces at Mines as per DMR guideline 16/3/2/4_B.
- Example of completed Clearance Certificate / confined space entry no 0215, dated 30 March 2022: Leach Pachuca 3c,
- "Detoxification of cyanide contaminated & / or redundant equipment and disposal of cyanide contaminated waste", Section 5, "Cyanide pipeline flushing",
- "Procedure for Issuing of Gas Monitoring Equipment", Section 7, "Access to Cyanide Installation and Equipment",
- "Obtaining Plant Engineer's / Manager's Permission to Conduct Maintenance on Cyanide Equipment",
- "Issuing a clearance certificate for cyanide areas and equipment". Also reviewed was the following clearance certificate, - Clearance certificate 0220, weld cyanide dosing drop box, 21 February 2023.
- It was confirmed that the procedures require, where necessary, the use of personal protective equipment and address pre-work inspections. The TSF uses the Harmony Continuous Risk Assessment SLAM (Stop - Look - Assess and Manage) system to cover pre-work inspections. The SLAM includes the names of the participants in the assessment. A Plant Procedures, "Cyanide PPE Requirements", defines the PPE level required (level 1, 2 or 3) and pre-work inspections to be conducted (where applicable).

Sighted and reviewed Intasol Standard Working Procedures (as for Harmony Mponeng Gold Plant):-
* Manuel dam wall building replaces cyclone operation.
* ITS-SWP-002, Operating valves,
* ITS-SWP-004, Moving carrying and installation of Pipes,
* ITS-SWP-006, HMS (Hazard Management System) Control system,
* ITS-SWP-007, Penstock operation,
* ITS-SWP-008, Depositioning slurry on TSF,
* ITS-SWP-010, Taking of Density samples,

* ITS-SWP-011, Manual Wall Building,
* ITS-SWP-011, Penstock sleeving, and
* ITS-SWP-010, Uplifting of the penstock.

Feedback from the workforce at the Savuka Plant Joint Health and Safety Committee meeting dated 11 October 2022 was observed with issues raised from the workforce, including new safety boots not being comfortable, concerns about the quality of overalls, problems with the dust extraction fans in the grading room, cannot differentiate between fire drill and cyanide alarms, and complaints about the amounts of dust experienced. Feedback is also obtained from the Safety Representatives.

One Team Meetings (OTM) are also channels of communication for feedback from the workforce. OTM meetings sampled in April 2021 included gas monitoring discussions. The OTM meeting ref. 1382, dated 23/12/2022, included a discussion on cyanide safety and symptoms of severe poisoning and response. All staff participate in the SLAM (Stop - Look - Assess and Manage) pre-work assessment/inspection system, which may generate issues of concern. Examples from SLAM books were sighted.

Feedback from the workforce on the TSF includes feedback from Daily Talk Safety meetings, which may include health and safety procedures, Attendance, Topic of the day, Discussion, Suggestions, and tasks of the day. The Plant and TSF use the Harmony Continuous Risk Assessment SLAM system covering the pre-work inspections. The SLAM includes the names of the participants in the assessment. Daily SLAM documents, which include toolbox talks, were sighted.

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 optimal pH for the operation of the Savuka Gold Plant is currently defined as 10.5 and is targeted to limit the evolution of hydrogen cyanide gas during production activities. This is included in the "pH control at leaching " procedure. The pH monitors are included in the DMS PMS weekly instrument technician inspection. The checks carried out include: - check reporting to SCADA, check the condition of probe, check the connection box, and calibrate the probe.

The operation uses ambient and personal monitor devices, with the first alarm set at 4.7 ppm and the second alarm set at 10 ppm HCN gas. Fixed Polytron HCN Gas monitors are located at hot spot areas at cyanide Offloading (1), the Cyanide Dosing Point (1), the leach (1), and at the Pulp sump (1). HCN gas monitors (fixed and portable are set to alarm at 4.7ppm and 10ppm. A 4.7 ppm alarm should be reported to the supervisor for investigation, and an alarm of 10ppm requires reporting to a supervisor and immediate

evacuation to a safe place upwind of the release (Procedure WS_CN_SM_105 - Entry into identified hot spot area). There are: - 6 x PAC 7000 HCN personal HCN gas monitors and 5 x X-am 5000 multi-gas (incl. HCN) personal gas monitors. At the TSF, the Savuka TSF Team Leader has one PAC 7000 personal HCN gas monitor and one is issued to the TSF Pipe Patrol.

Hot spot signage was sighted during the site inspection at cyanide dosing points, cyanide offloading, and residue pit. Hot spot surveys have been done since 2022 and are being done on a quarterly basis. So far, no high HCN readings have been observed. The Hot spot survey listed 60 potential hot spots on the plant. They were all checked on a survey on 9 December 2022, and all readings recorded zero. The Survey done on 18 July 2022 also registered all readings recording zero. The Survey that was done on 14 December 2021 included a reading at the top of tank no 8H of 0.3 ppm HCN gas, the top of tank 1A of 0.2 ppm HCN gas, and the top of tank 2B was 0.1 ppm HCN gas. TSF penstocks and deposition points are potential HCN gas hot spots, but only if abnormal conditions are experienced from the plant.

A Service Agreement is in place with Dräger, the HCN gas monitoring equipment manufacturer, for maintenance and calibrating for services valid from 1 February 2021 to 31 January 2024 (This includes the Plant and the TSF.). The manufacturer recommends 6 monthly calibrations of gas monitoring equipment. The calibration and maintenance schedule and records dated 25 October 2022 were sampled. Calibration is done during March and October. Previous calibration records were also sighted.

Signs are placed to warn that cyanide is present, that smoking is prohibited, no open flames or eating and drinking are allowed. Signs were observed in areas where cyanide is used, e.g., the offloading point for liquid sodium cyanide storage tanks and dosing points for leach tanks. Signs at the TSF entry points referring to cyanide and displaying emergency numbers, pipe signage on tailings pipes and road crossings were sighted.

It was confirmed in the January 2020 Sasol abbreviated Safety Data Sheet (SDS) that the cyanide is a light to dark-coloured liquid with an almond smell. Sasol, the liquid sodium cyanide producer, adds the dye during the production process. The Plant does not add any dye to the cyanide solution.

The Cyanide Facilities inspection file for 2022 was sighted. All safety showers have an integrated eye wash. It was observed during the site inspection that showers (with eye washes) and dry powder fire extinguishers were located at strategic locations throughout the plant where cyanide is used. The safety showers are inspected daily. The safety shower checklists for 2022, 2021, and 2023 were sampled. Safety showers are on a DMS PMS inspection checklist, and safety showers are a fitter monthly inspection requirement. The Fitter monthly inspection Cyanide Checks include: - check water supply and pressure, spray should reach full drench in 5 seconds, check water supply valve – should be open, check for choked or blocked sprayers, clear all sprayers by inserting wire, check alarm and light, and test shower operation and alarm reporting. A Fitter monthly inspection job card no P0019087 Safety shower No 1 dated 3-1-2023 was sampled. There were no faults found.

Dry powder fire extinguishers are checked monthly and serviced annually. The monthly checklist files for fire extinguishers for 2023, 2021 and 2022 were reviewed and sampled and confirmed the inspections are up to date.

The identification of pipes, including flow direction, was observed at the Gold Plant during the site visit. All reagent-strength cyanide pipes are colour-coded purple and indicating that they contain cyanide and include flow direction. Cyanide storage tanks are colour-coded purple with a red band as per the colour coding index. Tanks and slurry lines are labelled as cyanide process. The Plant has a pipe colour coding system that identifies all pipes and their contents. During the TSF site inspection, tailings pipeline labels indicating the presence of a toxic substance and the emergency telephone numbers to contact in case of a pipe leak were sighted.
The working language of Harmony Gold (including Savuka Plant) is English, with all documentation being in English, including the induction, which has to be passed before they are allowed to work. All procedures are in English, and training on procedures and task assessments are undertaken in English. All interviews with site personnel were conducted in English, except for one worker from Mozambique, who required an interpreter. It was observed during the site inspection that SDSs (Safety Data Sheets) for Cyanide and Ferrous Sulphate are displayed at the storage areas. A cyanide SDS is displayed in the First Aid room and on the gate of the Cyanide storage area (shortened version). Cyanide first aid information is available in the cyanide first aid rooms and the emergency trailer. The Cyanide first aid procedure is available in the first aid rooms.
There have been no lost time injuries since the takeover in October 2020, and a dressing case is being used to demonstrate the system. The incident investigation report based on the Standard Harmony Investigation system was reviewed. Incident no INC_2022_0659, dated 24 Dec 2022. R. Sesana was injured holding a firehose to hose spillage, balanced between her legs, whilst another employee opened the water valve, throwing her off balance and hitting the ground, lacerating her chin. The incident was investigated. The basic cause was that the employee undertook a task for which she was not trained. The Risk Assessment was incomplete, and the supervisor did not discuss the risk assessment or the full procedure. Also sighted and reviewed was the Savuka Gold Plant Accident / Incident reporting and investigation procedure.

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

X in full compliance with

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Savuka Gold Plant has first aid facilities at the Cyanide Emergency First Aid Room (Cyanide Off-loading) and the Emergency Trailer. During the site visit, it was observed that water, oxygen, antidote kits (antidote is stored in the plant fridges - confirmed during site inspections), telephones and alarm systems are present where employees could potentially be exposed.

A fully equipped emergency trailer is parked at the Cyanide Emergency Room. ER24 (proprietary name) are called when there is an incident to provide paramedic response and transportation to Fountain Hospital. The ER 24, 24-hour Emergency Response is equipped with ambulances and response cars, with oxygen, resuscitators and qualified personnel available to assist with any cyanide exposure incident. Nearby Fountain Hospital has oxygen, antidote kits, and resuscitators available and will accept patients exposed to cyanide.

At the TSF, communication is done via radio and cell phone with the plant control room. The TSF LDV (Light Delivery Vehicle) carries a first aid kit. The kit does not contain cyanide emergency equipment, as included in the Plant Emergency Response Team equipment. No cyanide emergency equipment exists on the tailings facilities. The staff use radios and cell phones to communicate and to receive instructions from the Plant in the case of high WAD cyanide in residues. The Plant control room is contacted in the event of an emergency, which will contact the Emergency Response Team from the Savuka Plant and ER24, as appropriate.

The "Daily Cyanide Facilities checklist" procedure, and the "Using the Emergency Cyanide Trailer" procedure, were sighted and reviewed. Also sighted and reviewed were the integrated cyanide facilities' emergency response registers for 2021, 2022 and 2023. The registers include inspections and checklists. Sighted were: -:

- First Aid station register
- Cyanide emergency trailer register
- Fire extinguisher inspection register
- X-am 5000 gas monitor inspection register
- First aid box inspection register
- Medical oxygen cylinder inspection register
- Stretcher inspection register
- Safety shower inspection register
- PAC 7000 gas monitor inspection register
- SCBA (Self Contained Breathing Apparatus) inspection register
- Cyanide antidote kit register.

Cyanide antidote kits are ordered from the Harmony Central Medical Hub a month before expiring. All antidotes expire at the same time.

The Plant has developed specific written emergency response plans or procedures to respond to cyanide exposures. The plan sighted was OP: Operational Procedure, Emergency Preparedness and Response Plan (EPRP) Savuka Gold Plant, WS_OP_SM_003, rev. 9, dated 8 December 2022, which includes reference to the Emergency Procedure For Cyanide First Aid Treatment and contains treatment regimens for all cyanide exposure routes. Also sighted was the Code of Practice (COP) Mine residue deposits - Savuka Gold Plant. This Code of Practice was drawn up in accordance with the Chief Inspector of Mines, DMR Mine Code number 10713, Savuka Gold Plant. There is also an OP: Operational Procedure, Emergency Plan Tailings Storage Facilities, Savuka Gold Plant, in place.

Cyanide Appointees, having undertaken the relevant first aid training, make up the First Aid team trained to conduct cyanide-related first aid. A First Aid Room was observed

during the site visit. ER24 is contracted to provide emergency assistance and transport patients (including cyanide patients) to Fountain Hospital. In the event of an emergency at the TSF, the Intasol Site Manager will call the plant control room, who will initiate the EPRP (Emergency Preparedness and Response Plan) responses. ER 24 (contracted) and Fountain Hospital (contracted) provide emergency response and casualty assistance to the Savuka Gold Plant, Mponeng Gold Plant and West Wits Tailings. ER24 is stationed on-site at the Medical Hub and at Fountain Hospital. Fountain Hospital is approximately 20 minutes away from the Gold Plant. The EPRP details the control room responsibilities, including contacting ER 24 for picking up the cyanide emergency patient. The "Ambulance arrival at the gold plant (Savuka Gold Plant)" procedure covers security entry procedures. This was confirmed during the interview with the Security Official.
ER24 is contracted to provide paramedic and ambulance support to transport cyanide patients to the mine Medical Hub and to Fountain Hospital, as required. An agreement between Harmony and Africa Healthcare t/a Fountain Private Hospital is in place. The agreement, signed on 22nd December 2022, confirms that the hospital will accept and manage cyanide patients according to ICMC (International Cyanide Management Code) cyanide protocols. The agreement confirms that Harmony will provide cyanide management training to designated Fountains Hospital staff and subsequent annual refresher training. The hospital commits to having Personal Protective Equipment and cyanide antidotes on site to simultaneously treat at least three cyanide emergencies.
ER24 and Fountain Hospital participate in cyanide exposure drills. The hospital agreement indicates that the hospital will participate in up to two cyanide drills per annum, and the Plant will notify the Hospital manager before the drills. The Hospital Manager will inform the drill organisers in case of mass casualties at the Fountain Hospital.

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:
The Plant has developed specific, written emergency response plans and procedures to respond to cyanide exposure or release scenarios. These are contained in the OP: Operational Procedure, Emergency Preparedness and Response Plan (EPRP) Savuka Gold Plant. In the event of an emergency at the TSF, the Intasol Site Manager will call the plant control room, which will initiate the EPRP (Emergency Preparedness and

Response Plan) responses. The procedures cover the following cyanide release scenarios: - Catastrophic release of hydrogen cyanide from storage or process facilities; transportation accidents; releases during unloading; Releases during fires and explosions; Pipe, valve, and tank ruptures; overtopping of ponds and impoundments; power outages and pump failures; and failure of tailings impoundments, heap leach facilities and other cyanide facilities.
Sasol and Tanker Services are responsible for managing cyanide incidents on the tanker routes between the Sasol production facility and Savuka Plant. Tanker Services is an ICMI-certified cyanide transporter, and Sasol is an ICMI-certified cyanide producer.
The following documents were reviewed, which describe other specific response actions:

- "Response to Abnormal and Emergency Conditions Procedure",
- “Site Personnel Evacuation Procedure”,
- "Mass Evacuation Procedure",
- “Emergency Procedure for Cyanide First Aid Treatment”,
- “Handling and Detoxification of cyanide spillage procedure”,
- “Cyanide spillage procedure",
- “Notification to Shafts regarding cyanide spillage into boundary dam procedure”,
- The Emergency Sampling procedure: Environmental Management System Emergency Preparedness and response manual ISO14001: 2015/8.2/00/2022-APA1NTO(027) Table 3.4 (a) structural failures within TSF, Post-incident activities, section 3 - sampling of water and soil quality to commence during incident and after clean-up spillage, and
- “Environmental Incidents procedure”. This is used to investigate the causes of any environmental incident.

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

X in full compliance with

The operation is

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

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Savuka Plant Joint Health and Safety Committee meeting dated 11 October 2022 was sighted, which included issues raised by the workforce: Safety boots not comfortable, concerns about the quality of overalls, problems with the dust extraction fans in the grading room, cannot differential between fire drill and cyanide alarms, and complaints about the amounts of dust. Feedback on all issues (including the emergency response planning process) is also obtained from the Safety Representatives and Union representatives.
One Team Meetings (OTM) are also channels of communication for feedback from the workforce. Sighted OTM meetings and sampled April 2021, which included gas

monitoring. Sighted OTM discussion on cyanide safety symptoms of severe poisoning and response ref 1382, dated 23/12/2022.
All staff participate in the SLAM pre-work assessment/inspection system, which may generate issues or concerns.
External stakeholders are not involved in the emergency response planning process, but feedback from stakeholders can also include issues relating to the emergency response planning process. ER 24 (contracted) and Fountain Hospital (contracted) provide emergency response and casualty assistance to the Savuka Gold Plant, Mponeng Gold Plant and West Wits Tailings. ER24 is stationed on-site at the Medical Hub and at Fountain Hospital. The ER 24 and Fountain Hospital take part in full-cycle emergency drills from the plant and are part of the feedback sessions. More detail is included in Standard of Practice 9.1 below. Medical contractors are included in the emergency drills. The Surface Fire and Emergency Team Captain regularly liaises with the Municipal Fire Department.

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 Procedure: OP: Operational Procedure, Emergency Preparedness and Response Plan Savuka Gold Plant addresses the following: -

a) **Primary and alternate emergency response coordinators with explicit authority to commit the resources necessary to implement the Plan** – covered in Section 4, page 26: Management Roles and Responsibilities - EPRP Coordinator, Emergency Response Team (ERT), ERT Leader, On Scene Commander, Incident Controller.
b) **Identification of Emergency Response Teams** – This is covered in Section 4, page 26: Management Roles and Responsibilities.
c) **Require appropriate training for emergency responders** – This is addressed in Section 5, Training and Section 7, Plan Training and Testing.
d) **Call-out procedures and 24-hour contact information for the coordinators and response team members** - The "Plant Emergency Response Team Call Out" procedure describes the process to be followed when calling out the plant emergency response team to deal with a cyanide emergency. During the site inspection, it was observed that emergency contact information, pictures, and numbers for the ERT were posted in the control room and the emergency cabin at the offloading area.
e) **Duties and responsibilities of the coordinators and team members are** addressed in Section 4, page 26: Management Roles and Responsibilities - EPRP

Coordinator, Emergency Response Team (ERT), ERT Leader, On Scene Commander, and Incident Controller.

f) List emergency response equipment, including personal protection gear and/or on-site. This is listed under Section 6, Resources Allocation, pages 28 and 29.

***g)* Procedures to inspect emergency response equipment and ensure availability when required –** The following procedures cover checking cyanide emergency equipment: - Daily Cyanide Facilities checklist procedure and Using the Emergency Cyanide Trailer procedure. The integrated cyanide facilities' emergency response registers also assure emergency response equipment availability. See Standard of Practice 6.3 above for more details on the registers.

h) Role of outside responders, medical facilities or communities in emergency response procedures – There are no roles for communities or external responders except ER24 and Fountain Private Hospital, contracted medical service providers. ER24 is contracted to provide paramedic and ambulance support to transport cyanide patients to the mine Medical Hub and to Fountain Private Hospital, as required. An agreement between Harmony and Africa Healthcare t/a Fountain Private Hospital is in place. The agreement confirms that the hospital will accept cyanide patients and manage them according to ICMC (International Cyanide Management Code) cyanide. protocols. The agreement confirms that Harmony will provide cyanide management training to designated Fountains Hospital staff and subsequent annual refresher training. The hospital commits to having Personal Protective Equipment and cyanide antidotes on site to simultaneously treat at least three cyanide emergencies.

ER24 and Fountain Hospital participate in full-cycle cyanide exposure drills and are part of the feedback sessions.

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 procedure, "Public Consultation and Disclosure / Emergency Communications", details how communications about an emergency are undertaken. It is clearly stated that "…Only the existing Corporate procedure for the communication for cyanide related incidents and accidents to Government Departments the Media and general public is used…".

The "Harmony Corporate Internal Crisis Communication Management Process for loss of life incidents/accidents involving highly regulated hazardous chemicals (*including cyanide*)", referred to above, was sighted. The process indicates a flow chart for

developing and approving information releases to external stakeholders, including management, regulatory agencies, the Media, external response providers and medical facilities. These procedures also apply to the TSF, where appropriate.
The operation has a procedure, "Procedure to notify ICMI (International Cyanide Management Institute) of any significant cyanide incident", which was developed to notify ICMI of any significant cyanide incidents, as defined in ICMI's Definitions and Acronyms document. There have been no significant cyanide incidents that have occurred that required reporting to ICMI.

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 following Plant procedures sighted include specific remediation measures:

- "Handling and Detoxification of Cyanide Spillage" This requires that spillages be neutralised with Ferrous Sulphate. The procedure includes the location of the Ferrous Sulphate on the plant.
- "Using Ferrous Sulphate" contains the procedure to follow when using ferrous sulphate to neutralize solutions and solids. Neutralised materials are required to be ultimately disposed of on the TSF. The procedure states: -

  "...

  3.6 Approximately 25kg of ferrous sulphate is required for every 50 litres of 33% strength liquid cyanide released. Ferrous Sulphate is stored at the main chemical store.

  3.9 Spilled cyanide should be dammed up with soil or sandbags, and ferrous sulphate added to the dammed cyanide solution in order to neutralize the cyanide.

- 3.10 Cyanide-contaminated soil/sand and ferrous sulphate must be disposed of into the metallurgical circuit as per the Sampling Procedure For Specialised Speciation And Environmental Samples – WM_CN_SM_029.
- 3.11 Industrial grade ferrous sulphate is green in colour. The blue colour and its shades of blue can be used as a rough indicator of the continuing presence of cyanide.

  …"

All drinking water is provided from a reticulated municipal water supply that would not be affected by any incident to surface or groundwater; therefore, the provision of an alternative supply is not required.

The "Antipollution dam operation" procedures and the "Cyanide spillage procedure" prohibit treatment chemicals such as sodium hypochlorite, ferrous sulphate and hydrogen peroxide near rivers and streams.
The following Plant procedures that were sighted include specific environmental monitoring measures:

- The surface sampling operational procedure includes cyanide sampling procedures for emergencies.
- The "Sampling of antipollution dam overflows" procedure, Section 3.2, requires that samples be taken every 30 minutes and tested for cyanide.
- In the Emergency Sampling procedure: Environmental Management System Emergency Preparedness and Response Manual, Table 3.4 (a) structural failures within TSF Post-incident activities, section 3 indicates that sampling of water and soil quality will commence during incident and after spillage clean-up.

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:
In the Plan, Section 5 - Plan Maintenance and Change Management, requires updating of the plan, according to the following circumstances: -
- Section 5.8.1 Regulatory changes,
- Section 5.8.2 New risk identified, or existing risk changed,
- Section 5.8.3 Resources or organisational structure change,
- Section 5.8.4 After drills and exercises,
- Section 5.8.5 After the EPP is used for an actual event,
- Section 5.8.6 On request from Harmony Risk Management Department,
- Section 5.8.7 Funding or budget level changes
- Section 5.8.8 Technology changes, and,
- Section 5.8.9 Any other major changes.

Furthermore, Section 5.7 states that the EPP document will be reviewed at least three-yearly.
Cyanide Drills are conducted periodically but at least annually. A cyanide splashing drill report of 6 July 2022 at cyanide offloading was sighted. The report includes learning points: positive points - Team assembled immediately, cyanide first aid protocol was followed appropriately. Improvement areas - only the Shift Foreman responded to the drill, and other employees communicated by radio did not respond as the man down alarm was seen as only for a drill. The drill was a partial drill to the gate.

The follow-up action was that Plant Management met with line supervisors, and line supervisors communicated with their team members continuously. A Follow-up drill was conducted in December - see the full cycle drill below.
A full cycle cyanide splashing drill was carried out to the Fountains Hospital on 15h December 2022. An employee was splashed with cyanide, and three employees responded to the cyanide alarm. All three dressed in cyanide PPE, the area was barricaded off, and the patient was given oxygen and taken to the showers. The patient was taken to the emergency shower, where his clothes were removed, he was washed, and mock antidote was administered. After that, he was taken to the cyanide emergency room. ER 24 arrived, took over the patient, and took him to the hospital. Upon arrival, ER24 took the patient to the washing bay for further washing, and he then went on to the emergency room. The area was barricaded, and hospital staff were dressed in cyanide PPE. The patient was checked, and medical treatment was administered. The drill ended.
Feedback on the drill was as follows: - More cyanide appointees need to be appointed so that more people are available to help with the emergency. Employees need to understand why the drills are conducted and take them more seriously. Cyanide appointees responding to a cyanide alarm take too long to get dressed in Cyanide PPE.
There have been no actual events or drills that required revision of the EPP.
The cyanide appointees are required to be involved in the cyanide man-down drills and other cyanide drills. The rest of the employees are bystanders and are required to go to the assembly points. There is a briefing after every drill to close all gaps, and an improvement has been noticed regarding the response and the time taken by the appointees for donning cyanide PPE.

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:
Cyanide hazard awareness training is given annually at e-learning induction and refresher training to: - Plant employees, including security; Contractors (permanent and temporary); Medical Hub staff; Intasol TSF contractors; and the Cyclone Projects Reclamation Section.
It was confirmed that the training includes Basic Cyanide First aid and medical treatment for cyanide exposures. This includes: - cyanide chemistry; interacting with oxygen; toxicity; symptoms; gas generation; how cyanide is transported; SHE (Safety, Health &

Environment) issues in the event of cyanide poisoning; first aid equipment for cyanide; First Aid training; emergency response chain; warning alarm systems; emergency response by control room; buddy system requirements; Cyanide PPE requirements and use; cyanide PPE for hospitals; Gas detection instruments; Cyanide first aid and antidote kits; Mine Health and Safety Act regulation 24.8.2; contents of medical aid kit details; Cyanide exposure and symptoms; the consequence of cyanide poisoning; generation of HCN gas; First aid procedure for cyanide poisoning; Cyanide patient to be transported to the hospital directly; Emergency response in case of the incident including TriPac; and the AGA Cyanide Guidelines Chapter 42 Medical Treatment Procedure, in the ambulance transport to the hospital.
The training matrix covering Savuka was sighted and confirmed induction e-learning for employees, plus 99 permanent contractors. A separate matrix for contractors was sighted. There are 72 Contractors on site, including Intasol and Cyclone Projects.
It was confirmed that refresher training in e-learning is undertaken every 12 months. Long-term contractors' induction is also refreshed annually.
During the electronic demonstration of the training matrix, it was confirmed that the records are kept electronically. Hard copies of the records are held at a Vaal Reefs depot in a storage container. The electronic database showed each employee's full training record, including courses and refresher training. This information is available and can be extracted and printed as required.

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:
Workers are trained to perform their normal production tasks, including unloading, production and maintenance, with minimum risk to worker health and safety and in a manner that prevents unplanned cyanide releases. The training matrix was observed that defines what training each worker is to receive based on their position and the tasks required of that position.
The Training Matrix includes detailed training requirements for all positions. This was confirmed during the demonstration of the Training Matrix. All positions and tasks with high cyanide risk must also receive training as a cyanide appointee and be found capable and competent. For example, the Cyanide Offloader receives additional training in cyanide offloading and the cyanide appointee training. This was confirmed in the electronic demonstration of the matrix.
The Intasol TSF Training Matrix was sighted, including all the Standard Work Procedures (SWPs) used as the basic training elements. The matrix also indicates the

expiry dates and the dates of PTOs (Planned Task Observations). The Intasol Matrix is updated as training is completed, and matrices for 2022 and 2023 were sighted.
The Training Officer received the following training: Train the trainer, Present with confidence, Level 3 and Level 4 best practice in training, Trainer accountability, professional Train the trainer, workplace assessor and registered assessor training, moderation training, safety leadership training, and Sexual harassment training. He also has 17 years of Production experience. The emergency trainer is an ILS (Intermediate Life Support) Paramedic (23 years of experience) who trains cyanide medical service providers. Her Qualification as a Paramedic allows her, through the HPCSA (Health Profession Council of South Africa), to give various levels of First Aid Training (including cyanide). She works through JT Services, the Registered Service Provider for the Certificates registered by the South African Labour Department. The training matrix confirmed that the required elements are included in the training matrix for each person. The SWPs (Safe Working Procedures) are used as modules for the task training as per the matrix.
The Intasol Trainer has completed Facilitation training, Conduct outcomes-based assessment (15 Credits Level 5 SAQA (South African Qualifications Authority) training, is an Assessor, and has undertaken Conduct Moderation of outcomes-based assessment training. He has 26 years of experience working on TSF with various TSF Contractors.
Intasol training is on-the-job training using SWPs and PTOs. All new Intasol employees are given a site-specific cyanide awareness induction by Harmony. All employees and permanent contractors are trained during the induction training before commencing work related to cyanide. Employees are only allowed to work with cyanide unsupervised, once they have been found competent.
The electronic demonstration of the training matrix confirmed that employees are evaluated using assessments and PTOs before being declared competent to perform their jobs. Competency levels are shown for each person on the training matrix. Targets are set by Management periodically. Intasol uses PTOs and additionally, uses informal, safe behaviour observation methods.
During the electronic demonstration of the training matrix, it was confirmed that the records are kept electronically. Hard copies of the records are held on-site for five years and thereafter at a Vaal Reefs depot in a storage container. The electronic database showed each employee's full training record, including courses and refresher training. This information is available and can be extracted and printed as required. Records include the names of the employee and the trainer, the date of training, the topics covered, and how the employee demonstrated an understanding of the training materials.

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 TSF and Process plant employees are trained in Cyanide Hazard Awareness training and are given e-learning induction and refresher courses. It was confirmed that this training included all unloading, production, maintenance and contracting personnel covering cyanide releases, decontamination, and first aid.
Cyanide Appointees are included in the training matrix, and it was confirmed that there are 15 appointees, including 5 Cyanide Offloaders. The Cyanide Appointees form the Emergency Response Team on the plant, and at least 2 appointees are present on each shift. It is the responsibility of the Foreman to ensure this is the case. The Cyanide Appointees lists were sighted on the notice boards at the cyanide emergency stations.
The training requirements for Cyanide Appointees are: - SCBA (Self-Contained Breathing Apparatus) training, Harmony First Aid, PAC 7000 personal HCN gas monitor, Proof of e-learning induction, and Module - US252337 Handling of liquid cyanide safely in a metallurgical plant.
No External providers are involved in the EPP, except ER24 and Fountain Hospital contracted medical service providers. The contracted Medical Response Team (ER 24) and the Fountain Hospital receive verbal training. They are trained by the Training Officers of Kusasalethu or Savuka, or Mponeng. Sighted training attendance register of 9 Paramedics and ambulance staff of ER 24 dated 6 October 2021. ER24 and Fountain Hospital take part in cyanide exposure drills. Sighted the attendance register dated 13 December 2022 covering cyanide first aid training for Fountains hospital staff.
All relevant personnel receive refresher e-learning every 12 to 18 months, which was confirmed in the training matrix. Expiry dates are yellow flagged in the Matrix, 3 months before expiry.
All Intasol staff are placed on the Mines Training database and receive first aid training. Certificates are available and recorded on the training matrix.
During the electronic demonstration of the training matrix, it was confirmed that the records are kept electronically. Hard copies of the records are held at a Vaal Reefs depot in a storage container. The electronic database showed each employee's full training record, including courses and refresher training. This information is available and can be extracted and printed as required. Records include the names of the employee and the trainer, the date of training, the topics covered, and how the employee demonstrated an understanding of the training materials.

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:
Harmony took ownership of the Savuka Gold Plant in October 2020. Many of the AGA (AngloGold Ashanti) strategies are being reviewed and rebranded for Harmony. In the next three years, a number of engagement strategies will be developed, which will include cyanide. The dialogue with stakeholders and communities was restricted during the COVID-19 regulations and additional constraints from 2020 to the beginning of 2022. A poster describing the Savuka metallurgical operations was sighted and is available on request.
Stakeholder engagement has been undertaken. The minutes of a Wedela Ward Councillors' feedback meeting on a dust grievance dated 30 September 2022 were sighted. This included the attendance register and decision and responsible person columns. Also sighted was a presentation on the dust suppression strategy developed to inform the community on what is being done in the short, medium and long term to deal with the issue. The process would also be used if cyanide grievances from the community or cyanide-related matters needed to be communicated.
A Harmony Awareness visit to farmers on 16 February 2023 at the Kusasa Framers Yard KUSASA was held. There were 8 Farmers present. The meeting discussed the dangers of farmers allowing their cattle to graze around the TSF area. Contact details were exchanged to enable future communication.

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:
Harmony took ownership of Savuka Mine in October 2020. Many of the AGA (AngloGold Ashanti) strategies are being reviewed and rebranded for Harmony. A poster describing the Savuka metallurgical operations is available on request and was sighted.
Most of the community in the vicinity of the West Wits Region (now called Mponeng Operations) is literate. Discussions can be held in Xhosa and Sotho languages, where required. The majority of the mine employees were previously employed by AGA, and there is an element of carryover. (Savuka was previously fully ICMI certified under AngloGold Ashanti.) The estimated percentage of the workforce living in the local communities within 20 km is 70%.
Fatalities or mass incidents are handled via the Harmony Corporate Communications Department. Newsflashes are distributed within the Company via e-mail. Mine management reports incidents to the Department of Mineral Resources and Energy

(DMRE). The DMRE reports selectively on repeated or critical incidents, not necessarily publicly or widely.

Information on significant cyanide exposures is available on the company ESG (Environmental, Social and Governance) website after appropriate investigations. (http://www.harmony.co.za/sustainability/sustainability-reporting/2022/ Page 163 mentions the cyanide code and cyanide incidents table) The information will identify on which sites the cyanide incidents occurred. No Cyanide incidents have occurred since Harmony took over the operations from AGA in October 2020.

Mine releases are reported to the Department of Water Affairs and Sanitation (DWAS) and the Department of Forestry, Fisheries and Environment (DFFE) following an investigation by the Mine Environmental Department. Sasol and Tanker Services are responsible for releases due to tanker incidents en route to the mine. Information on significant cyanide releases is available, after appropriate investigations, on the company ESG website (as above).