

***INTERNATIONAL CYANIDE
MANAGEMENT INSTITUTE***

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

Summary Audit Report

***Harmony Gold Mines Limited
Target Gold Plant
South Africa***

30th September – 4th October 2013



Name of Operation: Target Gold Plant

Name of Operation Owner: Harmony Gold Mines Limited

Name of Operation Operator: Harmony Gold Mines Limited

Name of Responsible Manager: Cyril Radebe, Plant Manager

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Location detail and description of operation:

Target Mine is one of the mines owned by Harmony Gold Mining, acquired from Avgold in 2004. The mine is located between Klerksdorp and Welkom, on the Witwatersrand basin in South Africa. Target Gold Plant was designed and commissioned in November 2001 to treat ore from Target 1 Shaft. The plant was designed to treat a 105 000 tons per month with a potential to expand to 160 000 tons for future demand. Currently, the plant treats ore from Target 1 shaft, Target 3 shaft, and waste dump with the majority being from Target 1 shaft and Target 3 shaft material. The plant was recently modified by installing a run of mine mill (ROM) to replace the two stage milling circuit, due to steel ball costs.

Ore is treated by run of mine milling, with part of the mill product directed to the gravity concentrator to recover the gravity recoverable gold which is then leached through the Intense Leach Reactor, followed by electrowinning and gold smelting using induction furnace. The other mill product is directed to the thickener for densification, followed by leaching through 6 of the 7 mechanical agitated leach tanks. The leached ore gravitates to the Carbon In Pulp (CIP) circuit, where activated carbon is added from the last tank. The pulp moves downstream while the carbon moves upstream. Loaded carbon is then removed from the first adsorption tank and pumped to the elution circuit. Carbon is then acid washed with hydrochloric acid and eluted with a solution of sodium hydroxide and sodium cyanide. Gold is recovered from the elution solution using electrowinning cells. The electrowinning sludge is dried and smelted in the induction furnace and then dispatched to Rand Refinery for refining. The eluted carbon is pumped to the regeneration kiln and then to the CIP circuit. The tailings from the CIP circuit are screened to remove fine carbon and then pumped to the tailings dam for storage. The plant uses potable water, return water from tailings dams and water from Target 1 shaft.



Auditor's Finding

This operation is

X in full compliance

in substantial compliance

not in compliance

with the International Cyanide Management Code.

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

Audit Company: Eagle Environmental

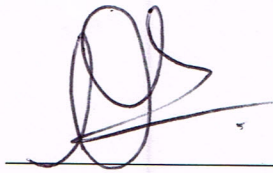
Audit Team Leader: Arend Hoogervorst

E-mail: arend@eagleenv.co.za

Names and Signatures of Other Auditors:

Name : Dawid M. L Viljoen

Signature



Date: 24/4/2014

Dates of Audit: 30th September – 4th October 2013

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

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

Target Gold Plant



29/4/2014

Facility

Signature of Lead Auditor

Date

Target Gold Plant

Signature of Lead Auditor

22nd April 2014

Auditor's Findings

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

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

X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:

There is a Harmony Group-wide, cyanide supply contract, covering all Harmony Gold Plants, in place with Sasol Polymers, as the sole supplier of liquid Sodium Cyanide, delivered by bulk tanker. This supply contract includes Target Gold Plant. Sasol Polymers is a signatory to the Cyanide Code and was re-certified as a fully compliant Production Facility with the ICMI Cyanide Code on 2 March 2010 and again, on 7th May 2013.

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

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

X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:

A Group-wide cyanide supply contract covering all Harmony Gold Plants (including Target) is in place with Sasol Polymers as the sole supplier of liquid Sodium Cyanide. Sasol Polymers is also responsible for the transport of cyanide solely using Tanker

Services, who started transporting Sasol Polymers-produced cyanide from July 2011. Tanker Services became a certified ICMI transporter on 13 December 2011. A Memorandum of Agreement (MOA) for the offloading of liquid sodium cyanide in terms of SANS 10231:2006 between Tanker Services Specialised Products Division and Harmony Gold Mining Company is in place. The supply contract and MOA cover the responsibilities and requirements for safety, security, unloading, emergency response (spills prevention and clean-up), route planning and risk assessments, community liaison, emergency response resource access and availability, training, and communication.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 2.2**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

The Group wide cyanide supply contract covering all Harmony Gold Plants (including Target) in place with Sasol Polymers as the sole supplier of liquid Sodium Cyanide requires cyanide to be supplied by road tankers and the seller as well as the transporter will be ICMI Compliant over and above national regulations. Offloading is covered by a Memorandum of Agreement (MOA) for the offloading of dangerous goods between Tanker Services Specialised Products Division and Harmony Gold Mines Target Gold Plant. The supply contract and MOA cover the responsibilities and requirements for safety, security, unloading, emergency response (spills prevention and clean-up), route planning and risk assessments, community liaison, emergency response resource access and availability, training, and communication.

There is a break in deliveries of cyanide to site by a ICMI certified cyanide transporter between July and December 2011. The auditors deem the break to be acceptable for Mine Code compliance purposes for the following reasons:-

- 1) The change of transporters was beyond the control of the mines,
- 2) There was only one ICMI certified transporter and one ICMI certified liquid cyanide supplier in South Africa and the mines were bound to the producer/transporter conditions,
- 3) Finding a replacement/alternate supplier/transporter in the short term was not feasible because the mines can only handle liquid cyanide on site and do not have the facilities to mix their own cyanide from briquettes,
- 4) the mines applied pressure upon the supplier to organise ICMI certification for the replacement transporter as soon as possible,
- 5) The interim cyanide risk was minimal because the new transporter, Tanker Services, took over all of the transporter resources of ICMI transport certified SiLog (dedicated bulk cyanide liquid tankers, trained and experienced owner-drivers and contract drivers, assessed route risk assessments, cyanide documentation and systems) and was, and still

is, covered in terms of Sasol's Product Stewardship and Responsible Care policies by the Sasol cyanide emergency response system (24 hour emergency control room, network of cyanide trained, emergency response spill and medical response service providers), dedicated cyanide tanker storage area and cyanide tanker decontamination facilities.)

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:

Design drawings for the cyanide off-loading and storage area were sighted, along with satisfactory inspection reports by the cyanide manufacturer's technical officer. The structures were designed and located on concrete and away from people and surface waters, away from incompatible materials, and built with materials appropriate for use with cyanide and high pH conditions. The tanker unloading slab is sloped and drains back into the cyanide storage bund area. The cyanide storage tanks, which are located inside concrete bunded areas, have level indicators equipped with lights and an audible alarm set to go off at 85% of actual capacity, to indicate on the SCADA control system. The Offloading procedure requires the Off loader to then immediately close the offloading air (supplied from the plant compressors) to stop offloading. The cyanide storage area is within an access controlled plant security area and the facilities are fenced and locked.

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:

Only liquid cyanide is used which is delivered via bulk tanker to storage tanks. The offloading procedure is detailed, spelling out PPE requirements, use of a buddy in the process, and clearly sequenced to prevent spillages and accidental releases during off-loading.

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

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

X in full compliance with

- The operation is** in substantial compliance with **Standard of Practice 4.1**
- not in compliance with

Basis for this Finding/Deficiencies Identified:

The site has 78 cyanide specific procedures, which include process and engineering procedures. These are supported by the Harmony Tailings Dams Mandatory Code of Practice (COP) for Mine Residue Deposits. There is a Fraser Alexander Tailings site specific task inventory lading to 8 procedures site specific for the TSF (Tailings Storage Facility) operations. Routine daily, weekly, monthly, quarterly and annual operational and TSF inspection reports, legal inspections, and checklists were sampled to check the effectiveness of systems and ensure that proactive and reactive management takes place. The plant maintenance and inspection schedule includes preventative maintenance inspections on cyanide critical equipment using a Planned Maintenance System (PMS) and a scheduling and data capture system called Maximo. Quarterly technical inspections with consultants of the TSF facilities are undertaken to ensure integrity and safety in addition to the monthly TSF inspections involving the site staff and TSF contractors. A change management procedure covering health, safety and environment is in place and operational.

There is a probabilistic water balance in place, and no scenario has been identified where the need has been highlighted to shut down the plant to prevent overtopping as the plant operates in a water deficit situation. There is no need for emergency power to prevent cyanide releases as the plant is designed to contain releases during power failure and the TSF is not affected by power outages as large volumes are available to take up any surge in the evaporation ponds. All spillages will be contained in bunded areas when power trips occur.



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:

Weekly meetings with the ore reserve manager are held, forecasting the feed mix to the plant. Monthly bottle roll tests are conducted on all feed sources. Higher cyanide addition rates were tested over a period of time to determine optimal cyanide / recovery parameters. Waste rock characterisation tests were also done and a two stage cyanide addition project is underway with the objective to save cyanide. A TAC 1000 cyanide addition system using automatic valves to control the cyanide addition is in place and a WAD 1000 cyanide analyser on the tails slurry is used for WAD control and manual feedback parameter setting.

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:

A probabilistic water balance is in place which is updated monthly with actual data. Information is included on rainfall, storm events, and solution deposition. Rainfall data is collected daily on the TSF and submitted to the TSF consulting engineers. Phreatic surfaces and stability analyses on the TSF are measured and checked quarterly and annually, where TSF COP parameters, including pool levels, are reviewed. The TSF pool levels and freeboard are measured daily. The TSF freeboard is surveyed monthly and TSF pool levels and return water dam levels are checked routinely.

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:

Indications from tip point data and the on line WAD analyser is that the WAD CN is less than 50 ppm and thus no special measures are needed for the protection of wild life and livestock.

The compliance point used by the plant is the residue transfer tank system where an on line WAD 1000 analyser has been used since 2009. The WAD cyanide values for 2011 were all below 50 mg/l. The WAD cyanide values for 2012 were below 50mg/l except for a period of two months when the WAD cyanide exceeded 50 mg/l at the residue transfer tank system as part of a planned cyanide dosage increase to reduce the problematic increase in undissolved gold residues. However, a review report, "High Residue Cyanide in Residue during January-March 2012" by the Plant Metallurgist cross-checked WAD cyanide measurements on the TSF, which indicated that WAD cyanide levels in the TSF during the 2 month period in question were consistently below 50mg/l WAD cyanide. The WAD cyanide values for 2013 were below 50 mg/l except for one incident where the cyanide feed pump leak resulted in high values due to the manual operation of the sump pump, pumping the spillage to the leach. (The leak was quickly repaired.) Check samples are taken weekly from the residue tank and check samples have been taken weekly at the deposition points (since January 2013) and residue tank (since certification) to verify WAD 1000 on line analyser results and cyanide degradation profile. Monthly samples are taken from the return water dams by environmental department and weekly by the plant - all values between 2010 and 2013 are below 50 mg/l WAD cyanide.

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

No direct discharge to surface water takes place and this was verified during the site inspection. The closest stream, the Losdoring Spruit, is 3 km away and no seepage could reach it.

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

X in full compliance with

- The operation is** in substantial compliance with **Standard of Practice 4.6**
- not in compliance with

Basis for this Finding/Deficiencies Identified

The TSF is equipped with under drains, paddocks and cut-off trenches with seepage pumped back to the TSF return water system for re-use in the process. Boreholes are sampled and monitored for cyanide. The Return Water Dam is clay lined to prevent seepage and the Lined Dam is plastic lined to prevent seepage. No boreholes are used for livestock, irrigation or drinking water. Boreholes are sampled and analysed for WAD cyanide. The mine uses the Department of Water Affairs standard for groundwater which is 0.5ppm free cyanide. Borehole samples are sampled every 6 months and, since certification date, all values have been less than 0.03 mg/l WAD cyanide.

Current Backfill standards limit the free cyanide in the final product sent underground to 20ppm. Ferrous sulphate is added to the batch until the correct free CN level is achieved. There are procedures in place to manage and monitor batch levels going underground. The underground water pumped to the 1 million gallon dam is sampled and the WAD cyanide measured values are less than the 0.2mg/l WAD CN detection level. An evaluation report on the impact of backfill on worker health and beneficial uses of the underground water is available and the Risk survey report of 26 Jan 2010 indicates maximum WAD cyanide from the bulkhead water at 1.46 ppm and HCN gas measurements indicate zero where people work, with one spot of 1.3 ppm HCN gas.

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

X in full compliance with

- The operation is** in substantial compliance with **Standard of Practice 4.7**
- not in compliance with

Basis for this Finding/Deficiencies Identified:

The cyanide reagent storage tanks are placed on plinths above the bund floor inside a concrete bund. All cyanide solution tanks are installed on ring beams and are placed inside concrete bund areas. The CIP and Leach tanks except no 4 (in process of being rubber lined) are rubber lined to reduce risk of tank base plate leaking into the soil of the ring beam and inspected annually. A Risk Based Inspection procedure for the rubber lined tanks is in place which includes the schedule of the inspections, cleaning of the tanks in preparation for the inspections, the visual as well as spark test method detailing the inspection of the rubber, thickness testing of the tanks, the corrective action in case of faults, and including the checking of the steel base in case of leaks in the rubber lining.

Records covering the thickness testing, inspections, rubber lining inspections and spark testing were reviewed. The leach tanks are equipped with leak detection pipes in the ring beams. Procedures are in place covering Maintenance and Inspection of the Leak Detection System, Inspection of Cyanide Tank Ring Beam Holes and Sampling of Detected Leaks.

All bunds are constructed with sumps and sump pumps designed to pump spillages back to the process tanks. Reagent strength cyanide lines are placed inside an HDPE secondary containment pipe, cut open at the top and equipped with flange covers. The cyanide solution lines in the plant are installed in overhead launders and above tarred or concrete surfaces. The residue line running past the reagent storage area is inspected and thickness tests are conducted regularly. The TSF lines inspected daily and are subject to thickness testing. The Cyanide tanks are constructed of steel and there are steel pipelines, and stainless steel ball valves. Pipe and valve materials and types compatible with cyanide & high pH conditions are specified in plant drawings.

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:

The detailed drawings of the original plant are available. No QA/QC records were available but evidence that design standards and quality control was done and BS 2654 was used. The original construction company used AS/NZS ISO 9001 for quality control and the quality control manual used was sighted. The geotechnical report of the plant construction site was sighted. Although there were no QA/QC records on site, correspondence with the Australian Project Engineer indicated that the QA/QC documentation is stored at the offsite storage facility of Fluor Australia. A professional structural engineer inspected the site in January 2013 and concluded that the plant is safe and serviceable.

Quarterly inspection and reports (using input from the Hazard Management System and the monthly reports) with reviews from the geotechnical consultants (including a professional consulting civil engineer) were sampled for 2011 and 2013. No significant issues were highlighted that could prevent the TSF from being operated as designed. The annual TSF Audits for 2011 and 2012 were sighted and also reported no problems.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 4.9**
 not in compliance with

Basis for this Finding/Deficiencies Identified:

Procedures for environmental monitoring (including sample preservation and chain of custody procedures) of surface water and borehole water, developed by a competent person, were sighted and checked. There are no discharges to surface water but boreholes are in place up and down stream of the plant. Surface and borehole sampling is done monthly, with plant borehole sampling being done weekly, and wildlife is monitored daily on the TSF for any mortalities and the Environmental Department monitors wildlife on a monthly basis.

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

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

A Decommissioning Plan for Target Plant is in place which includes an implementation schedule for decommissioning activities. The decommissioning plan is reviewed annually or more frequently in the case of changes.

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

X in full compliance with

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



Basis for this Finding/Deficiencies Identified:

The document, "Closure cost assessment for Harmony Gold Mining Company", dated June 2013 contains a line item of R450 070 for Target Plant cyanide decommissioning was sighted. The Armgold/Harmony/Freegold Joint Venture Company Summary Status of the Rehabilitation Trusts, 30 June 2013 document, showing a current status of R123 376 621, was sighted. These trust funds are established by legal requirement in terms of the Minerals and Petroleum Resources Development Act for closure, decommissioning and rehabilitation.

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 site has 78 cyanide specific procedures, which include process and engineering procedures. These are supported by the Harmony Tailings Dams Mandatory Code of Practice (COP) for Mine Residue Deposits. There is a Fraser Alexander Tailings site specific task inventory lading to 8 procedures site specific for the TSF (Tailings Storage Facility) operations. Routine daily, weekly, monthly, quarterly and annual operational and TSF inspection reports, legal inspections, and checklists were sampled to check the effectiveness of systems and ensure that proactive and reactive management takes place.

The plant maintenance and inspection schedule includes preventative maintenance inspections on cyanide critical equipment using a Planned Maintenance System (PMS) and a scheduling and data capture system called Maximo. Quarterly technical inspections with consultants of the TSF facilities are undertaken to ensure integrity and safety in addition to the monthly TSF inspections involving the site staff and TSF contractors. A change management procedure covering health, safety and environment is in place and operational.

Workers are involved in formal risk assessments, daily toolbox meetings, weekly Thursday safety meetings, and workforce safety meetings where safety and health procedures / issues are discussed. worker involvement and participation was confirmed during interviews with workers.

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

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

Fixed cyanide gas monitors are installed on top of the cyanide storage tank, in cyanide bund, near the residue tank, in the smelt house, in the leach area and in the backfill area. Furthermore, there are 6 portable PAC 7000 cyanide gas monitors units used in the plant. Calibration records were sighted.

Cyanide gas “hot spot” surveys are conducted fortnightly and reports were sampled. Hotspots were identified but there were none reporting above 10 ppm cyanide gas identified. The TSF Supervisor is issued with a portable PAC 7000 cyanide gas personal monitor and hot spot surveys were also undertaken on the TSF with no values detected.

Safety showers are located at appropriate places throughout the plant and inspected regularly. The use of dry powder fire extinguishers was confirmed during site inspections. Fire extinguishers are checked monthly.

The plant uses colour coding and direction flow for reagent strength cyanide lines and other lines and labelling was observed. Slurry lines are labelled “cyanide” at strategic positions. Colour coding is displayed in the plant. Eating and drinking is only allowed in designated areas. Accident and incident reporting and investigation procedures, based upon the site safety reporting requirements, were found to be in place and effective.

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:

Oxygen is available in the first aid room, smelt house, control room and cyanide offloading PPE locker. Antidote is available in the first aid room, at backfill and the smelt house and stored in fridges according to manufacturers’ requirements. Potable water is available. Man down alarms are located at the offloading and at the elution substation close to control room and at the leach. Radios are used for communication with the control room. All shift employees are issued with radios. Cyanide alarm is also connected

to the Medical Hub at the mine. The cyanide equipment is regularly checked and tested and mock drills are held regularly on site. A Plant Emergency Response Team is in place for dayshift, with the 4 shift operators trained in cyanide emergency after hours. Emergency Response Plans are in place covering the plant and the TSF.

The Harmony Ernest Oppenheimer Mine Hospital was confirmed to be able to treat cyanide emergencies and Hospital staff are given cyanide awareness training by the Harmony No 1 Plant training department annually. Emergency exercises (mandown and spill) are conducted periodically from the plant to the hospital and additional cyanide drill training is done and documented. Netcare 911 is the contracted ambulance service undertaking patient transport.

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 site-specific emergency scenarios and responses for its emergency response plan. The emergency preparedness plan combines existing procedural responses and emergency provisions to deal with the various scenarios and includes and identifies the emergency response team and coordinators who are on all shifts. These preparations are regularly reviewed in the light of changes, mock drill learning points and employee feedback.

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

The workforce is involved in the Emergency Response Plan process through safety meetings, shift meetings, training and emergency drills. Furthermore, the Plan was

circulated for comments to master operators, emergency team captain, medical station superintendent, environmental manager, electrical foreman, training officer, proto manager, plant engineer, and plant safety officer. The community is not directly involved in the Plan but is informed on its contents during dialogue sessions. Drills are used to involve hospital and ambulance staff in planning processes.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 7.3**

 not in compliance with

Basis for this Finding/Deficiencies Identified:

The Emergency Preparedness Plan details clear duties, roles and responsibilities for the various emergency scenarios. The control room operator is the primary response coordinator, authorised to call ambulance, security, and plant management. The emergency equipment inventory was checked and site inspections confirmed availability and readiness. The Plan includes contact references (telephone, cell phone, etc) of internal and external resources for the various scenarios, particularly with detail where external resources and skills might be needed. Periodic drills involving internal and external stakeholders ensure that roles and responsibilities are understood and clearly implemented.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 7.4**

 not in compliance with

Basis for this Finding/Deficiencies Identified:

The Emergency Preparedness Plan includes details for appropriate emergency notification and reporting (internal and external) and the call-out procedure and contact information lists which are updated regularly. Media communication is dealt with in the Plan.

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



X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

The environmental monitoring of surface water, liquid cyanide spillage, and use of ferrous sulphate procedures cover clean-up and remediation relating to releases, pipeline failures and spills, as appropriate to the site-specific identified scenarios. Use of neutralization processes and materials is clearly covered, as is disposal of contaminated materials and the use of treatment chemicals such as ferrous sulphate in surface water which is prohibited.

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

The Plan is required to be reviewed annually, following incidents, following a drill, following a cyanide process modification or following modification of cyanide safety equipment. The report of a drill which included a cyanide spill and cyanide related injury was sighted. Evidence was sighted of learning points emerging from the various cyanide man-down drills.

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

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

X in full compliance with

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



Basis for this Finding/Deficiencies Identified:

All plant personnel inside the plant fence (including security and Fraser Alexander tailings (FAT) TSF contractors) are trained in basic cyanide awareness. The training matrix includes a flagging system to timeously indicate need for training and refreshers. This was confirmed during interviews with staff. Refresher training is done annually, based on schedules using a training shift system (which is also used for routine update training). Selected employees were checked in interviews on their understanding of cyanide hazards, first aid and emergency response and this was further verified through checking of their training records. Records are retained for 40 years on the Plant, after which the records are sent to the central Harmony archive.

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

X in full compliance with

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

 not in compliance with

Basis for this Finding/Deficiencies Identified:

The training matrix covers all operational tasks and a skills development program is in place covering Mining Qualifications Authority standards. All Trainers are trained and registered as Assessors and the Harmony Metallurgy training establishment is formally ISO 9001 accredited. All employees are trained before being allowed to work on a cyanide section. Assessments are used to test knowledge and competency. A PTO (Planned Task Observation) system is in place. Pre-work assessments are conducted that could lead to additional refresher training, as required. A yearly workbook is completed containing all procedures and is signed off by the operator. Records are retained for 40 years on plant, after which the records are sent to a central archive.

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:

The Training matrix specifies required training for the emergency response team and training commenced. Induction training spells out emergency response for all other plant

employees during cyanide releases. The matrix also includes training for cyanide releases and emergency team training.

The Emergency responders are involved in mock drills, and training is given to the Ernest Oppenheimer Hospital and Netcare 911 ambulance and Paramedic staff by a Harmony No 1 Plant training official. All staff receives emergency first aid training which includes medical oxygen application. Training and participating in drills confirmed during interviews. There are no community members in the area of the Mine and thus are not involved in the Emergency Response Plan. Periodic mock drills are undertaken and training personnel attend these drills and formally evaluate response and performance. Shift training drills “to the gate” are scheduled 3 monthly. Full cycle drills to the hospital are conducted annually. Emergency training refresher is done using the spare shift system. Refresher training is done annually. Records are retained for 40 years on plant, after which the records are sent to a central archive.

9. DIALOGUE: Engage in public consultation and disclosure.

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

X in full compliance with

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

Basis for this Finding/Deficiencies Identified:

Dialogue meetings are two-way dialogue sessions involving both dissemination of information and the answering of questions on cyanide. The local township (opposite the plant) Nyakallong, police, local traffic police, ambulance services, teachers, councillors and fire station were given a presentation on cyanide using English, Xhosa, and Sotho on 14 March 2012. Questions included hospitals treating cyanide patients, cyanide skin penetration, cyanide dangers in the long term to the community, traffic officer's response to cyanide spills, use of cyanide tanks after closure of plant. A regional presentation by Harmony Regional Services and Management covering Matjabeng Municipality, SASOL, the Emergency services, Government, was given on 28 March 2012. A High school from the nearby town of Hennenman also visited the plant in 2012.

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

X in full compliance with

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



not in compliance with

Basis for this Finding/Deficiencies Identified:

Dialogue meetings are two-way dialogue sessions involving both dissemination of information and the answering of questions on cyanide. The local township (opposite the plant) Nyakallong, police, local traffic police, ambulance services, teachers, councillors and fire station were given a presentation on cyanide using English, Xhosa, and Sotho on 14 March 2012. Questions included hospitals treating cyanide patients, cyanide skin penetration, cyanide dangers in the long term to the community, traffic officer's response to cyanide spills, use of cyanide tanks after closure of plant. A regional presentation by Harmony Regional Services and Management covering Matjabeng Municipality, SASOL, the Emergency services, Government, was given on 28 March 2012. A High school from the nearby town of Hennenman also visited the plant in 2012.

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

X in full compliance with

The operation is

in substantial compliance with **Standard of Practice 9.3**

not in compliance with

Basis for this Finding/Deficiencies Identified:

Posters are used to communicate cyanide issues and fliers have also been developed which explain cyanide and its uses. Owing to literacy problems, most of the cyanide presentations have to be given verbally in the predominant local languages of Sotho and Xhosa, as well as English. Copies of presentations were made available to stakeholders who requested them.

Reporting on incidents has not been done because there have been no incidents. Injuries must be reported to the Department of Minerals Resources who do not necessarily make the information publically available. Similarly, spills and releases must be reported to the Department of Water Affairs and Environment. Transport related incidents are reported by Sasol Polymers and the transporter, Tanker Services, through their own reporting mechanisms.

The Harmony Group communication policy is followed. Cyanide incident response would need to be prepared by the Corporate Communications Department. The Harmony website contains an item, "Harmony and the Cyanide Code". The Cyanide Code is mentioned in the Sustainable Development Report, p124 (2012). Information on significant cyanide exposures and releases would be made available, after appropriate investigations, on the company website (<http://www.harmony.co.za/sustainability/governance/cyanide-code>) and via the annual Sustainability Report Report.

