INTERNATIONAL CYANIDE MANAGEMENT INSTITUTE

Cyanide Code Compliance Audit Gold Mining Operations

Summary Audit Report

Gold Fields Driefontein Gold Mine Driefontein 1,2 and 3 Gold Plants South Africa

4^{th} – 22^{nd} August 2008

Name of Operation:	Gold Fields Driefontein Gold Mine (Gold Plants 1,2 &3)
Name of Operation Owner:	GFI Mining South Africa (Pty) Ltd ("GFMSA")
Name of Operation Operator:	GFI Mining South Africa (Pty) Ltd
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Location detail and description of operation:

Gold Fields Driefontein Mine is a large complex and is served by three Gold Plants. Gold Fields Driefontein No.1 Gold Plant is situated 60 kms from Johannesburg in the North West Province of South Africa. The plant was commissioned in 1972 and initially designed and installed to treat 100,000 tons of ore per month but this has been gradually increased to a monthly throughput of 240,000 tons. Gold Fields Driefontein No.2 Gold Plant is situated 87 kms from Johannesburg in the North West Province of South Africa. The plant is currently treating 180 000 tons per month of screened waste rock material reclaimed from the Rock Dumps located on the West and East side of the mine. Gold Fields Driefontein No.3 Gold Plant is situated 87 kms from Johannesburg in the North West Province of South Africa. No.3 Gold Plant was originally a uranium plant which was converted in 1998 to a low-grade waste rock treatment facility. The plant was constructed using a combination of new as well as existing equipment on site. The plant is currently treating 120 000 tons per month of screened waste rock material reclaimed from the Rock Dumps located on the West and East side of the mine.

The GoldFields Driefontein No.2 and 3 Gold Plants are located next to each other and situated 3Km from Carletonville in the North West Province of South Africa.

The mineral processing technology in the No. 1 plant is based on a SAG milling circuit, followed by cyanide leaching. The retrofit SAG mill installation was commissioned in September 2003, replacing the conventional crushing and milling circuits. The filtration and zinc precipitation process was replaced by CIP (carbon in pulp) process and a centralised elution and carbon treatment facility capable of processing carbon from all three of the Driefontein plants. The CIP plant was installed in August 2001. Thickening in No.1 plant takes place in three high rate thickeners with the thickener underflow pulp being pumped to the leaching circuit. The thickener overflow is returned to the milling circuit as dilution water. Lime control is conducted in the thickeners to ensure a pre-leach pH of above 10.5.

No.2 Gold Plant is solely dedicated to treating waste rock material. Milling in No.2 plant is through two primary SAG mills and a ball mill which is in closed circuit with one of the two SAG mills. The other SAG mill operates as a single stage SAG mill feeding the thickeners along with the closed circuit mills. Two high-rate thickeners in No 2 plant are used to dewater the slurry prior to leaching. The plant incorporates cyanide leaching and a carbon in pulp (CIP) plant. Loaded carbon is transported by road to the central Elution Circuit at Driefontein No.1 Gold Plant. Lime control is conducted in the thickeners to ensure a pre-leach pH of above 10.5.

No.3 Gold Plant is solely dedicated to treating waste rock material. The process in No 3 plant incorporates 4 (four) SAG mills, cyanide leaching and a carbon in pulp (CIP) plant with loaded carbon being transported by road to the central Elution Circuit at Driefontein No.1 Gold Plant. Thickening of the pulp in No 3 plant is achieved in a single high rate thickener. Lime control is conducted in the thickener to ensure a pre-leach pH of above 10.5.

The No.1 plant leach circuit consists of sixteen, 1200m^3 air agitated, leach tanks with 60º conical bottoms, with gold dissolution being achieved during a forty eight hour retention period. Liquid Sodium Cyanide at a strength of 33% is pumped from storage to the head leach stage to achieve a titrated head cyanide concentration of 220 ppm to ensure gold dissolution is achieved during the 48 hours retention time. As leaching progresses cyanide concentration gradually decreases to approximately 120 ppm in the middle leach tank and 80 ppm in the leach tail stage. The leached slurry gravitates to a pump cell circuit which consists of eight 125m^3 mechanically agitated tanks filled with carbon at a concentration of 40 – 45 grams per litre.

The No.2 plant leach circuit consists of sixteen air agitated leach tanks with a volume of 923m^3, with 60º conical bottoms. Liquid Sodium Cyanide at a strength of 33% is pumped from storage to the head leach stage to achieve a titrated head cyanide concentration of 190 ppm to ensure gold dissolution is achieved during the 48 hours retention time. As leaching progresses cyanide concentration gradually decreases to approximately 100 ppm in the middle leach tank and 80 ppm in the leach tail stage. The leached slurry from No.2 plant is pumped to the carbon in pulp (CIP) circuit, which consists of six 100m^3 mechanically agitated tanks filled with carbon at a concentration of 35 – 40 grams per litre. Loaded carbon is pumped out of the head tank and screened over a screen to be transported by road to the central elution plant at Driefontein No.1 plant for gold recovery.

The No.3 plant leach circuit consists of nine 600m^3 air agitated leach tanks, with 60º conical bottoms. Liquid Sodium Cyanide at a strength of 33% is pumped from storage to the head leach stage to achieve a titrated head cyanide concentration of 190 ppm to ensure gold dissolution is achieved during the 45 hours retention time. As leaching progresses, cyanide concentration gradually decreases to approximately 100 ppm in the middle leach tank and 75 ppm in the leach tail stage. The leached pulp is pumped to the carbon in pulp (CIP) circuit and passes over a linear screen to remove tramp material. The circuit consist of six 110m^3 mechanically agitated tanks filled with carbon at a concentration of 40 gram per litre. Loaded carbon is pumped out of the head tank and screened over a screen to be transported by road to the central elution plant at Driefontein No.1 plant for gold recovery.

Loaded carbon is treated with a dilute hydrochloric acid solution to remove calcium build up inside the carbon pores. Gold is then stripped from the carbon in a ZADRA elution process with the gold bearing solution being pumped in a split stream through electro winning cells and sludge reactors. Gold plates onto the stainless steel cathodes of the Electro winning cells and the anode in the sludge reactors from the pregnant eluant solution.

No 1 plant residual slurry from the pump cell circuit can be pumped through a two stage cyclone to produce backfill for underground secondary support, or it can be pumped directly to the tailings disposal system. The final tailings slurry achieves a WAD cyanide value of less than 50 ppm. Water recovered from the SDR (Slimes Dam Return) water dams with WAD cyanide concentration less than 0.5 ppm is pumped back to the plant to be used as process water.

Residue from No 2 plant is disposed of through four sets of disposal pumps operating on a two on standby basis to the tailings disposal system Water recovered from the SDR (Slimes Dam Return) water dams with WAD cyanide concentration less than 0.5 ppm is pumped back to the plant to be used as process water.

Final residues from No 3 plant are pumped to the finals tanks at Driefontein No.2 Gold Plant's residue disposal tank system for disposal through the process as described above for No.2 Plant tailings disposal.

Auditor's Finding

This operation is

☐ in full compliance

X in substantial compliance *(see below)

☐ not in compliance

with the International Cyanide Management Code.

* The Corrective Action Plan to bring an operation in substantial compliance into full compliance must be enclosed with this Summary Audit Report. The plan must be fully implemented within one year of the date of this audit.

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: 16/03/2009

Dates of Audit: 4th – 22nd August 2008

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.

Gold fields Driefontein Gold Mine

Facility | Signature of Lead Auditor | Date 1/4/09

Certified/notarized:-

AVRIL JILLIAN MIDGLEY
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28 Old Main Road, Hillcrest, 3610
REF: 9/1/8/2 Hillcrest. 22/8/2008

Auditor's Findings

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

Standard of Practice1.1: 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:
The three Gold plants' cyanide manufacturer and supplier, Sasol, is an ICMI Code Signatory and has achieved full compliance in a verification audit against the ICMI Cyanide Code. Sasol only supplies liquid cyanide, delivered by bulk tanker, to the mine.

The supply contract stipulates that the supplier must be a signatory to the ICMI and must be ICMI Code compliant.

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:
Liquid cyanide in bulk tankers is transported to the three gold plants on the mine by Sasol Infrachem SILog, a subsidiary of Sasol. Sasol Infrachem SILog is a signatory to the ICMI Code and was certified as a transporter on March 8th 2007.
The contract stipulates in detail, the responsibilities and requirements for packaging and labeling, 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. It also includes any sub-contractors that may be used.

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 contract requires that appropriate emergency response plans are put in place and that training to deal with identified cyanide emergencies is undertaken. Control measures are note to be appropriate to deal with the transportation, handling, delivery, and off loading of liquid cyanide. The bulk liquid cyanide tanker travels by road and does not cross any national or international boundaries. Chain of custody documentation from production site to mine site were reviewed and found to be appropriate.

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:
Detailed, professionally designed, drawings for the Driefontein 1 Gold Plant cyanide unloading and storage area were sighted which clearly indicated the structures were designed with cyanide in mind and located on concrete and away from surface waters. Quality control documentation was sighted indicating that appropriate engineering checks were undertaken. Secondary containments built from concrete provide a competent barrier to leakages and provide adequate and appropriate containment. The liquid cyanide storage area is located in the open air in a well ventilated area to prevent hydrogen cyanide gas building up. Cyanide storage tanks are equipped with load cells and ultrasonic level indicators linked to the SCADA (computerised operations control system) with high level alarms set at 80%. Procedures covering cyanide unloading and handling were reviewed and found to be effective. Cyanide areas are fenced, locked and security controlled with adequate controls and separation to prevent mixing with incompatible materials.
Driefontein 2 and Driefontein 3 gold plants share a common offloading section with separate storage tanks for each plant, and with the liquid cyanide being pumped to separate storage tanks on each plant. Detailed, professionally designed, drawings for the cyanide unloading and the Driefontein 2 storage area were sighted which clearly indicated the structures were designed with cyanide in mind and located on concrete and away from surface waters. Secondary containments built from concrete provide a competent barrier to leakages and provide adequate and appropriate containment. The common liquid cyanide off loading area is bunded with concrete with storage tanks located in the open air. The Driefontein 2 plant liquid cyanide storage area is also located in the open air in a well ventilated area to prevent hydrogen cyanide gas building up. Plant cyanide storage tanks are equipped with load cells and ultrasonic level indicators linked to the SCADA with high level alarms set at 80%. The Driefontein 2 storage tanks in the common offloading area have ultrasonic level indicators which indicate in the control room on the SCADA computerised control system. Procedures covering cyanide unloading and handling were reviewed and found to be effective. Cyanide areas are fenced, locked and security controlled with adequate controls and separation to prevent mixing with incompatible materials.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 3.2**

not in compliance with

Basis for this Finding/Deficiencies Identified:
The three Gold Plants only use liquid cyanide and thus there are no mixing facilities. Procedures are in place to cover solid and liquid spill responses although there are no controls for solid cyanide as this is not used on site. All procedures include step by step task and hazard identification, pre-work inspections and appropriate actions for normal, abnormal and emergency occurrences. PPE requirements are included in procedures. Use is made of the Buddy system to optimise safety and safe handling. Inspection checklists and schedules were sighted and employee interviews that were conducted confirmed satisfactory cyanide awareness and competency. All reagent cyanide facilities are covered in the PRAGMA computerised preventative maintenance system, which defines maintenance inspection frequencies. Regular documented, operational inspections are undertaken by shift staff and these are supported by regular legal inspections by safety officers and management.

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.

in full compliance with

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

not in compliance with

Basis for this Finding/Deficiencies Identified:
The three gold plants are in the process of switching from old to new cyanide procedures with a “tandem” process currently in place. The new system has a task inventory which contains 42 process procedures and 46 operating and maintenance standard operating procedures. There are a further nine environmental procedures relating specifically to cyanide and 33 emergency procedures. The TSF operating manual (developed from the original design documentation and parameters for the facility) and 19 Fraser Alexander Tailings (the TSF management contractor) procedures were sighted and reviewed. Weekly, monthly and quarterly inspections of the TSF facilities are undertaken and subsequent management meetings are held to ensure integrity and safety. The plants have change management processes in place and functioing and although the TSF uses the plant change management processes, the contractor has his own change management procedure.
Preventative maintenance and inspections are controlled by an electronic system called PRAGMA. Key pumps, pipelines, tanks, bunded areas and equipment were sampled and

checked on the system and found to be systematically maintained through visual and mechanical checks, thickness tests and historical reviews. Routine daily and monthly inspection reports, legal inspections, and checklists were sampled and employees interviewed to check the effectiveness of systems and ensure both proactive and reactive management. The probabilistic water balance indicates that there is no need for emergency power for pumps as plant design ensures containment during power failure.
Although the switch from old to new procedures is not deemed to pose threats to health, safety and the environment because of inherent cyanide management competency in the old system, a corrective action plan has been agreed to in order to confirm effective, full implementation of the new procedures, and training thereof.

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

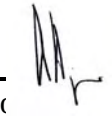
not subject to

Basis for this Finding/Deficiencies Identified:
In all three gold plants, test work is done using bottle roll tests and supported by diagnostic leach tests conducted by external laboratories. Plant test work has looked at options to reduce both lime and cyanide consumption. Cyanide set point changes are implemented by the area supervisors and authorised by the plant managers and logged in the various control room log books. All three gold plants use a TAC 2000 cyanide addition control and analyser for primary, optimised, cyanide addition control. Manual samples and titrations are used by all plants as back up. No 1 plant has a MINTEK Cynoprobe with WAD and Free cyanide measurement operating on CIP tails. No 1 plant is also considering implementation of two stage cyanide addition following the delivery of a second cyanide control TAC 1000 and WAD 1000 equipment. Use of a WAD analyser on the leach and CIP tails on Number 3 plant was considered but rejected.

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 comprehensive, probabilistic water balance (GoldSim) has been prepared for all three plants and TSFs by external consultants which were sighted and demonstrated. The water balances fully comply with Code requirements. Information in the Balances include rainfall (including some 80 years of historical data), storm events, solution deposition and phreatic levels at the TSF. The Water Balances link to the mine's REMIS computerised, environmental database. Procedures and operating plans for the TSFs have been developed, and were sighted. Daily plant inspections record all water pond levels as well as rainfall data and phreatic levels at the TSFs and these and other management issues are discussed at weekly meetings between the plants and the TSF contractor. Procedures and plans are in place to manage normal and emergency conditions. The minimum freeboards and operating capacities of ponds are identified and documented. All relevant procedures, plans and initiatives were reviewed and found to be appropriate in managing the plants and TSFs to prevent overtopping and unintentional releases.

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

in full compliance with

The operation is X in substantial compliance with Standard of Practice 4.4

not in compliance with

Basis for this Finding/Deficiencies Identified:
WAD cyanide values for discharges from all three plants to the TSFs and open process solution ponds have been shown to be below 50 ppm and thus no special measures to restrict access are considered necessary. However, reliable data only covers 3 months of WAD cyanide measurement and a corrective action plan has been agreed which will require 6 months of data to demonstrate consistency and sustainability. Daily wildlife mortality inspections are undertaken and no cyanide-related bird mortalities have been experienced since the signing of the ICMI Code. A birdlife census has been conducted by the provincial Gauteng Department of Agriculture, Conservation and Environment.

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:
The plants have no direct discharges to surface water. Fissure water is extracted from the underground shafts for safety reasons and to lower risk of seepage to the nearby Wonderfontein Spruit ("Stream"). There are procedures in place to manage spills and releases to prevent discharge to surface water and ongoing surface and groundwater monitoring takes place.

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 mines in the area are located above dolomite and fissure water is extracted from shafts to prevent flooding and this impacts upon groundwater characteristics. The dams, though unlined, and also located on top of dolomitic substrata, are equipped with under drains and catchment paddocks to contain any run off from the sides of the dam and seepage. Monitoring boreholes are provided and monitored to establish early warning in the event of any seepage occurring. Current and historical data indicates cyanide levels are predominantly below the limits of detection. The jurisdiction monitors water quality results against generic water quality standards. There is no specific, identified use for groundwater in the mine's catchment area. Potential seepage into paddocks and containment areas around TSFs are monitored by inspections and managed via the TSF operating manual. Of the three plants, only Plant No 1 produces backfill. No 1 plant mill tailings are transferred as underground backfill by batch process which is tested before release. A MINTEK study of the heath and safety risks associated with cyanide underground have indicated a very low risk of HCN gas generation. Batched backfill is tested against a limit of 10 ppm WAD cyanide (recommended by MINTEK) and ferrous sulphate is added to the batch if limits are exceeded.

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

in full compliance with

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

not in compliance with

Basis for this Finding/Deficiencies Identified:
All tanks and pipes are installed inside bund areas but the leach tank containment areas are not deemed competent to contain spillages due to cracks and wall damage. The plants have therefore developed bund area upgrade projects to address this and other bund crack repairs, as well as confirming capacities and interlinkages of bunds. It has been agreed that this will form a part of corrective action plans to confirm Code compliance in this area. Until the upgrades and repairs are complete, the sites' emergency procedures will manage any issues that exceed current containment capacities. Solutions and liquids in secondary containment are pumped back via sump pumps into the circuits and all secondary containment areas are maintained empty. The reagent strength cyanide sump pumps deliver back to the cyanide storage tanks. Spill prevention is primarily managed through the use of procedures, preventative maintenance and training. Procedures were sighted covering pond inspections, solution water management, and stormwater management. The containment of spillages from the tailings lines required additional paddocking which has been included in the Corrective Action Plan. Effective procedures were also sighted which manage cyanide spillages, and leaks. Cyanide tanks and pipelines are manufactured from materials compatible with cyanide and high pH conditions.

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

X in full compliance with

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

not in compliance with

Basis for this Finding/Deficiencies Identified:
In the absence of detailed QA/QC documentation, the plants commissioned a professional engineer to conduct structural inspections which have resulted in a programme of preventative maintenance and repair work. The Engineer also checked all cyanide facilities, tanks, valves and fittings and confirmed them fit for purpose. The PRAGMA preventative maintenance system is in place which guides daily, weekly and monthly operational inspections covering all the on-going operations involving cyanide equipment.

No specific TSF modifications were noted but the weekly reports for the TSFs were sighted and reflected appropriate on-going engineering controls and checks on construction, stability and safety, as is expected in a "work in progress" such as a TSF.

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:
A monitoring procedure and cyanide sampling plan is in place for all plants to sample both surface and groundwater for cyanide. Monitoring, sample preservation and custody and chain of custody procedures were developed internally by competent persons using MINTEK guidelines and checked by the Environmental Manager. Monitoring and inspections (including checks for bird mortalities and bird species on the TSFs) are guided by a procedure for wildlife monitoring. Boreholes are sampled and checked monthly, surface water is monitored monthly, return dam water weekly and cyanide in plant tailings daily. Detail on sample points, up gradient, down gradient and around the site was reviewed and found adequate for sample point circumstances.

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 is in place to cover cyanide decommissioning at cessation of operations. An implementation schedule forms a part of the decommissioning plan.

Provision is made for review of the decommissioning plan during the life of the mine and after any plant modifications.

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:
Financial provision for metallurgical plant closure is made in the Gold Fields Interim Closure Plan for Driefontein Gold Mine. Cyanide related decommissioning cost are implicitly included and the difference between in house and third party costs is covered in the provision for contingencies and will be explicitly included in the revised closure plan due for finalisation in December 2008. Decommissioning costs are covered in the Gold Fields Mining Environmental Trust Fund.

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 three gold plants are in the process of switching from old to new cyanide procedures with a "tandem" process currently in place. The new system has a task inventory which contains 42 process procedures and 46 operating and maintenance standard operating procedures. There are a further nine environmental procedures relating specifically to cyanide and 33 emergency procedures. The development of the task inventory was the basis for checking cyanide exposure scenarios. Procedures include as a basic standard, PPE requirements and pre-work inspections. Plant procedures were extensively sampled and checked through examination and employee interviews and records relating to risk assessments were checked for worker input and involvement, and found satisfactory. The plants have change management processes in place and functioing and although the TSF

uses the plant change management processes, the contractor has his own change management procedure. Procedures were developed from risk assessments and reflect responses to normal and abnormal conditions. Worker involvement occurs in "Green Area" shift meetings, in risk assessments, and through consultations in Health & Safety Committee meetings.

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:
On all three plants, there are on-line PH monitors in the leach head tanks which are linked to the SCADA with pop-up alarms and interlocks with cyanide pumps that activate at pH 10.1. Formal surveys have been carried out to identify hotspots where HCN gas levels exceed 10ppm. On-going inspections and checks are also used to monitor and check facilities and emergency response equipment functioning. Safety equipment such as safety showers, low pressure eye wash stations, and powder and sodium bicarbonate fire extinguishers are numerous and adequately signposted. A site wide pipe colour coding system is in operation which includes cyanide pipe colour coding and directional flow signage. Tanks are colour coded or labeled appropriately. Fixed and portable HCN gas monitors are used on the plants and are calibrated and maintained according to procedures using manufacturers recommendations. Formal employee interviews were used to check awareness and sensitivity to health and safety measures and the response from employees and contractors alike, was found to be appropriate and acceptable. Signage on the plant was found to be effective and included both text (in English) and pictograms. Accident and incident reporting and investigation procedures, based upon the site safety incident 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:
Cyanide Emergency equipment (oxygen, radio, antidote kit, cyanide emergency alarm) is located at the emergency rooms near to all cyanide storage areas. Cyanide emergency procedures form part of the site-wide emergency preparedness plan which covers the whole site and includes the cyanide facilities on all three plants. The scope of the plan includes site-based responses, the use of an emergency response team and supporting paramedics, the use of a fully equipped emergency cyanide trailer, and includes provision for evacuation of patients, by ambulance, to the local Gold Fields Leslie Williams mine hospital, which is adequately staffed by appropriately trained personnel. Emergency first aid equipment, antidotes (stored in fridges according to manufacturer's specifications and listed on the PRAGMA system), medical oxygen and BA(Breathing Apparatus) sets are accessible and this is supported by a formal cyanide first aid protocol and procedure. Equipment is regularly checked and tested and mock drills are held on all three plants and in conjunction with the hospital. Interviews confirmed employee knowledge of cyanide hazards, and emergency response.

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 plants have an emergency response plan which forms a specialised appendix of the Mine Disaster Plan. The Plans include various site scenarios identified and tested through plant based risk assessments and includes suitable response procedures and processes 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. Mine related responders and service providers (hospital, ambulance) undertake major emergency responses due to the limited capacities of the local authorities to provide specialist assistance, but the local authorities are, nevertheless, are kept informed.

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 revised Emergency Response Plans were discussed at the Divisional Health and Safety meetings on site. Communities have been made aware of both cyanide risks and the emergency planning as a part of the on-going community dialogue but are not involved in the planning because they have no designated role or responsibility.
Representatives of the workforce (employees, Health & Safety Representatives and Union representatives) were involved in the risk assessments to develop the emergency scenarios and response in the emergency response plan and procedures. Presentation materials and documentation on the communications was sighted. Full cycle drills are used to involve hospital 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 Response Plans include the duties and responsibilities of the plant controller and the Emergency Controller, as well as the wider roles of the emergency manager, emergency response coordinator, emergency logistics coordinator and the spill response coordinator. A supporting Cyanide Emergency Response Guideline document contains extensive supportive information in case of extended emergencies. Emergency equipment lists were checked and site inspections confirmed availability and readiness. The Plans include 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. Emergency Team members were checked and training records and assessments showed the individuals to be well prepared and well equipped for cyanide emergencies. Periodic full scale 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 Response Plans includes full details for appropriate emergency notification and reporting as well as the call-out procedure and contact information lists which are updated regularly. Media and external communication is done via corporate requirements included in the Gold Fields Corporate Affairs Policy and the Gold Fields crisis communication procedure.

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

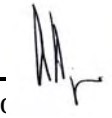
The operation is in substantial compliance with **Standard of Practice 7.5**

not in compliance with

Basis for this Finding/Deficiencies Identified:
The Emergency Preparedness Plans include specific remediation measures but also cross-reference to detailed and specialised procedures which 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, is prohibited. Sampling procedures also cover remediation issues. In the event of a spill, a sampling plan will be set up, based upon the existing framework and modified according to site and event specific requirements.

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 Emergency Preparedness Plans are required to be reviewed annually following incidents and emergency drills or when new information regarding cyanide becomes available. Mock drills are used to test the effectiveness of the Plans and these are observed by the Training Officer and the sectional safety officer who may make recommendations on changes and improvements.

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 employees and contractors receive cyanide awareness "e-learning" training and cyanide first aid training. Written competency tests are taken, supported by oral checks and evaluations. Plant cyanide training programs were reviewed. Refresher training is conducted when employees return from annual leave. Training records are retained at the central Driefontein training centre.

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.

in full compliance with

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

not in compliance with

Basis for this Finding/Deficiencies Identified:
Training is done using operational procedures. The system is based upon three categories: Category A (basic competencies before employee enters the plant), Category B (basic competencies before entering the workplace) and Category C (operational specific competencies for the operator). The plants are in the process of implementing and training new procedures and have completed approximately one third of the training. The old and new procedures are being run in "tandem". However, the effectiveness and sustainability of the new procedures needs to be confirmed and a corrective action plan has been agreed to see the remaining two thirds training completed and a representative sample of PTOs (Planned Task Observations) completed to verify competency. Existing procedures, while not fully code compliant, manage cyanide risk adequately and are not deemed by the auditors to pose immediate and substantial risk to human health and/or the environment.
Access to the plants is controlled and this system is used to ensure that only trained persons enter the site and ex-leave returnees are prevented from accessing the plants using their normal access cards until they have completed their refresher training.
Training is based upon an Outcomes based system and linked to mining industry unit standards for metallurgy. Training officers have been trained appropriately. Training records are kept for two years and then archived separately for 50 years.

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

in full compliance with

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

not in compliance with

Basis for this Finding/Deficiencies Identified:
All employees receive basic cyanide awareness "e-learning" and first aid training which includes patient decontamination and cyanide first aid. A separate emergency response team will deal with incidents. The plants are in the process of implementing and training new procedures, including responses to cyanide releases, and have completed approximately one third of the training. The old and new procedures are being run in "tandem". However, the effectiveness and sustainability of the new procedures needs to be confirmed and a corrective action plan has been agreed to see remaining two thirds training completed and a representative sample of PTOs (Planned Task Observations) completed to verify competency. Advanced training is given to the emergency response teams but not all of the team members have been through the advanced training. This has also been included in the Corrective Action Plan as an area needed for completion. Periodic mock drills are undertaken and training personnel attend these drills and formally evaluate response and performance. Training records (which are kept for 2 years

and archived for 50 years) were checked to confirm attendance and successful completion. General cyanide worker refresher training is scheduled annually. Specialised Emergency Team refresher training (including relevant external responders) is done as per schedule and based upon availability of courses and places. Training is provided by qualified training personnel.

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:
Public awareness and management of cyanide programs for stakeholders and surrounding communities have been held and records of meetings and materials used were sighted. The majority of attendees were farmers and neighboring community members. The focus of the meetings and presentations was awareness of cyanide and cyanide facilities and possible accidents. The meetings were held to give an opportunity to both present information to stakeholders and to receive comments, questions and feedback. Attendance numbers at these meetings ranged from twelve up to seventy seven.

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:
Public awareness and management of cyanide programs for stakeholders and surrounding communities have been held and records of meetings and materials used were sighted. The meetings were held to give an opportunity to both present information to stakeholders and to receive comments, questions and feedback. The majority of attendees were farmers and neighboring community members. The focus of the meetings and presentations was awareness of cyanide and cyanide facilities and possible accidents. Attendance numbers at these meetings ranged from twelve up to seventy seven.

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:
Information presented on cyanide is based upon material developed by the Gold Fields Academy and process flow information and diagrams based upon the different plants. Owing to literacy problems, most of the cyanide information is supplied in presentations given in the indigenous language of the community which includes Zulu, Xhosa and Pedi. Use is also made of visuals and pictograms.
Incident information is provided to government officials according to legal reporting requirements. The Procedure for emergency response classifies incidents from levels 1 - 3. Level 1: Emergency involving no injuries and / or has not resulted and does not pose an imminent threat of significant environmental damage. Level 2: Emergency which involves minor injuries requires appropriate communication externally and poses an imminent threat of environmental damage. Level 3: Emergency involving major injuries or worse and which has resulted in significant environmental damage. Policy requires tht all level 3 emergencies be reported to central and provincial government and to local government structures (which is relayed to local communities) from level 2. A Procedure for external environmental communication is in place.
Environmental: All level 3 and above is reported to Department of Water Affairs and Forestry. Weekly all incidents are reported to Corporate Head Office with detailed descriptions of all level 2 emergencies and above. Environmental statistics are reported in the Corporate annual report with level 3 incidents and above including a description.
Safety and Health: SAMRASS (South African Mine Reportable Accidents Statistics System) are reported to the Department of Minerals and Energy which include all lost time injuries and fatalities, serious incidents e.g. TSF failures, gassing incidents, and loss of consciousness. All Safety, Health and Environmental statistics are included in the annual report which is publicly available. Focus is placed upon verbal communication because of high illiteracy and a mine employee is dedicated to this communication. Written material (which is also used to brief verbal presentations) has been developed and is widely distributed.