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## **FINAL COMPLETION REPORT**

### **Gold Fields Kloof Mine**

#### **Introduction**

This Final Completion Report presents the evidence to support the successful implementation of the Corrective Action Plans to correct the deficiencies identified in the certification audits of Kloof 1 and 2 Gold Plants, held from 29<sup>th</sup> September – 3<sup>rd</sup> October 2008, as a part of the ICMI certification of Kloof Mine.

#### **Corrective Action Plan - Kloof 1**

**Principle 4 – OPERATIONS** – manage cyanide process solutions and waste streams to protect human health and the environment.

**Operations Practice 4.3** Implement a comprehensive water management program to prevent unintentional releases.

Element 4 (Design of ponds and impoundments freeboard above the maximum design storage capacity determined to be necessary from water balance calculations)

#### **Deficiencies**

- Under normal production conditions and design storm events, containment is not sufficient to prevent overtopping of the TSF return water dams.

#### **Corrective Action**

- Plans are underway to clean the return water dams. The return water pumping capacity is being increased and a bigger return water pipeline is planned to be installed.

#### **Evidence sighted by Auditors**

Subsequent to the compliance audit, return water pumping capacity was increased by installation of a new pump. Water balance simulation scenarios done by Golder & Associates on 175,000 metric tons per month throughput indicated that the cleaned return water dams, in conjunction with the increase in pumping capacity, would provide the TSF with sufficient containment/pumping capacity to prevent overtopping of the return water dams.

The no 6 return water dam was desilted and surveyed capacity increased from 52,000 m<sup>3</sup> to 242,100 m<sup>3</sup>. The 1: 50 storm spill frequency containment capacity requirement is 196,000 m<sup>3</sup>, versus the available 242,100m<sup>3</sup> current capacity, thus making the available containment capacity code compliant. Evidence confirmed by site visit and photographs.

## **Corrective Action Plan – Kloof 2**

**Principle 4 – OPERATIONS** – manage cyanide process solutions and waste streams to protect human health and the environment.

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

Element 1 (Spill prevention or containment measures provision for all unloading, storage, mixing and process solution tanks)

### **Deficiencies**

- Significant crack in residue bund noted.

### **Corrective Action**

- Repairs are required which will be undertaken through a Project that is in place to refurbish the residue tank bund area.

### **Evidence sighted by Auditors**

Instead of refurbishing the entire residue tank area, which includes redundant tanks, the choice was made to only refurbish the current operational residue area and add new bund walls. The concrete floors were repaired and made leak proof and plinths were also repaired. Verified the completion of the project. The new bund volume is 862 m<sup>3</sup> and the largest tank is 784m<sup>3</sup>; providing the required containment capacity.

## **Corrective Action Plan – Kloof 1**

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

Elements 1, (Cracked bunds), 2 (Bunding capacities inadequate to hold 110% of the largest tank.), 5 (containment measures for process solution pipelines) and 6 (seepage and standing water and TSF line failure)

### **Deficiencies**

- 1. All bund areas require repair of cracks and leaks.
- 2. The bund capacities of the Reagent Strength Storage bund area, Leach bund areas 1-8, leach bund areas 9-10, and Residue tank bund area are insufficient to meet Code requirements for holding a volume greater than that of the largest tank within the containment and any piping draining back to the tank, and with additional capacity for the design storm event.
- 5. Reagent strength pipeline from the Storage area to the leach requires secondary containment.

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- 6. seepage and standing water from maturation dams where a TSF line failure could lead to contamination of Leeuwspruit stream.

### **Corrective Action**

- 1. A project is currently underway to repair all cracks and leaks in bund areas.
- 2. A project is underway to increase the bund capacities to meet Code requirements.
- 5. The reagent strength pipeline will be modified to include secondary containment.
- 6. Seepage cut-off design to be developed to return water to pond and prevent standing water from affecting TSF lines.

### **Evidence sighted by Auditors**

- 1. Cracks and leaks in bund areas were surveyed by a Professional Engineer and repaired to his satisfaction. The repairs were verified complete during site inspection by ICMI auditors.
- 2. Sighted Engineer's Report and drawings which included bund capacity requirements for all bund areas. Bund wall modifications were undertaken to meet Code capacity requirements and were verified by site inspection.
- 5. A decision was taken to reroute the reagent strength pipeline from its current position inside the mill to run outside the building and place the total length of the line, up to the leach tanks bund area, in a secondary containment, consisting of a launder covered with Perspex to enable inspections. The launder drains back to the reagent strength cyanide storage area bund. Sighted pipeline plans and verified completed replacement pipeline and launder.
- 6. An investigation identified a source of seepage from a penstock and repairs were undertaken. A second source of seepage, which emanated from the main maturation ponds, was also remediated, through the installation of a French drain system and piping leading to an evaporation area. The adjoining tailings pipelines were surrounded by rock berms for further containment of any residue slime spills. Seepage is sampled and flows monitored to evaluate effectiveness of system. The actions and results were verified during site inspection.

### **Corrective Action Plan – Kloof 1 & 2**

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

Element 5 (In the absence of QA/QC documentation, issue of a report by an appropriately qualified person concluding that the plant can continue to be

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operated within established parameters consistent with the Code's Principles and Standards of Practice.)

### **Deficiencies**

- Following a fit for purpose inspection by a professional engineer, he required that additional civil remediation work needed to be done at the residue tank bund, CIP tank bund and leach bund area, prior to issuing of an appropriate certificate.

### **Corrective Action**

- Plans are in place to complete the remedial work.

### **Evidence sighted by Auditors**

- Fit for purpose reports by professional engineer, signing off on the remedial work at the residue tank bund, CIP tank bund and leach bund area, for Kloof 1 and Kloof 2 Gold Plants were sighted.

### **Conclusion**

The Lead Auditor, following discussions within the audit team, is satisfied that the corrective actions taken, meet the requirements of the corrective action plans and thus enable substantial compliance in these operations and production practices to be revised to Full Compliance.



**Arend Hoogervorst**  
**Lead Auditor**

**Date: 11<sup>th</sup> September 2009**