

# SUMMARY AUDIT REPORT

for the March 2016  
International Cyanide Management Code Certification Audit



**Prepared for:**

Kinross Gold Corporation  
Tasiast Mauritanie Limited S.A. (TMLSA)

**Submitted to:**

International Cyanide Management Institute  
1400 "I" Street NW, Suite 550  
Washington, D.C. 20005

**FINAL**

January 3, 2017

**RAMBOLL ENVIRON**

**Ramboll Environ**

605 1<sup>st</sup> Avenue, Suite 300  
Seattle, Washington 98104

[www.ramboll.com](http://www.ramboll.com)

## SUMMARY AUDIT REPORT

**Name of Mine:** Tasiast Mine

**Name of Mine Owner:** Kinross Gold Corporation

**Name of Mine Operator:** Tasiast Mauritanie Limited S.A. (TMLSA)

**Name of Responsible Manager:** Raitt Marshall, Vice President and General Manager

**Address:** ZAR 741, BP 5051  
Nouakchott, Mauritania

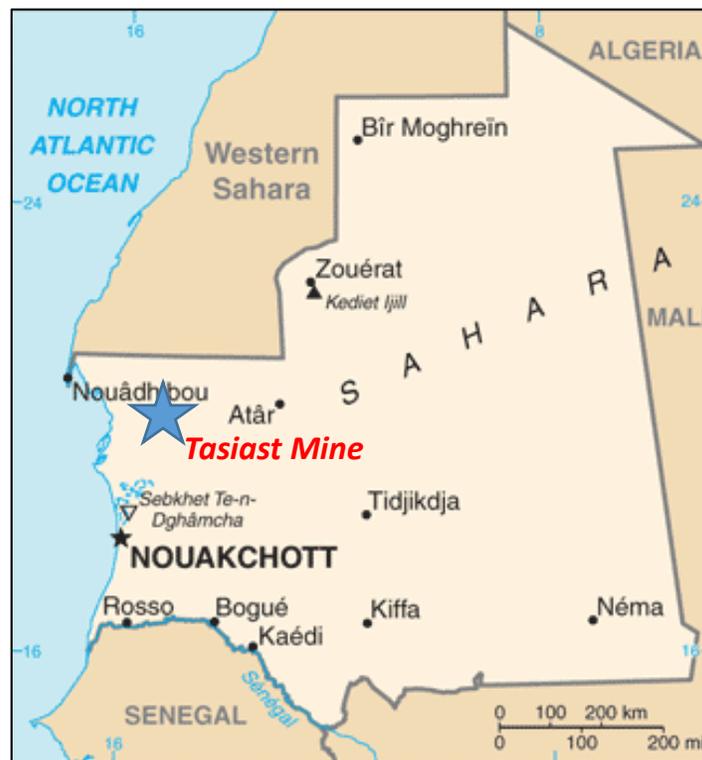
**Telephone:** +1 416-900-3672

**Fax:** N/A

**E-mail:** [raitt.marshall@kinross.com](mailto:raitt.marshall@kinross.com)

### Location detail and description of operation:

The Tasiast mine is located in the western Sahara desert in northwestern Mauritania (20°34'10" N, 15°30'19"W), 355 kilometers north of the capital, Nouakchott.



The mine is an open pit operation, and processes ore through both milling/carbon-in-leach (CIL) and dump leach mineral extraction processes. Cyanide is received in conventional dry briquette form (nylon supersacks overpacked in plywood boxes in standard steel sea containers) via ocean transport at the Port of Nouakchott, and then trucked to the mine site.

Cyanide facilities include:

- a dedicated remote cyanide warehouse, a dedicated cyanide mixing and storage facility, an ADR plant, two (Piment and West Branch) dump leach facilities, and associated barren and pregnant solution pipelines and pumping systems; and,
- a dedicated cyanide warehouse, a dedicated cyanide mixing and storage facility, a CIL plant, an active tailings storage facility (TSF-3), and interconnecting tailings and reclaim water pipelines and pumping systems.

At the time of the audit, two other formerly used tailings facilities (TSF-1 and TSF-2) were noted to be in the early phases of closure.

Shortly after the completion of the onsite portion of the audit, the Mauritanian Ministry of Labour issued a decision barring selected expatriate employees from working at the Tasiast site due to allegations of work permit validity issues. On June 20, 2016, Kinross Corporate made the decision to suspend mining and processing operations pending resolution of the dispute, and evacuated the expatriate workforce pending discussions with the Ministry and resolution of the dispute. International Cyanide Management Institute (ICMI) representatives were contacted and briefed on the situation. TMLSA was able to successfully resolve the issue, however, and production resumed on August 2, 2016.

**SUMMARY AUDIT REPORT**  
***Auditors' Finding***

The operation is:   ■ in full compliance  
                          in substantial compliance  
                          not in compliance with the *International Cyanide Management Code*.

**Audit Company:**       **Ramboll Environ**  
                          605 1<sup>st</sup> Avenue, Suite 300  
                          Seattle, Washington 98104  
                          USA

**Audit Team Leader:** Glenn Mills, EP (CEA)  
                          e-mail: [glennmills52@gmail.com](mailto:glennmills52@gmail.com)

**Names and Signatures of Other Auditors:**

  
John Lambert, EP (CEA)  
e-mail: [jlambert@environcorp.com](mailto:jlambert@environcorp.com)

**Date(s) of Audit:** March 15-22, 2016

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 Detailed 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.

Tasiast  
Name of Mine

  
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Signature of Lead Auditor

January 3, 2017  
Date

## SUMMARY AUDIT REPORT

**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.**

The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of Practice 1.1

### ***Discuss the basis for this Finding/Deficiencies Identified:***

TMLSA purchases cyanide exclusively from Cyanco International, LLC - Houston Production Plant, Alvin, Texas, USA, under a master cyanide production and delivery (supply) contract. Purchase Orders (POs) are periodically issued against the contract and specify quantities to be delivered. The master contract recognizes the commitment of both parties to obtain and maintain ICMC certification, and the requirement extends to the Cyanco supply chain; see the discussion under Standard of Practice 2.

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

### *Standards of Practice*

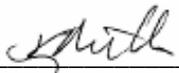
**2.1 Establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters.**

The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of Practice 2.1.

### ***Discuss the basis for the Finding/Deficiencies Identified:***

TMLSA purchases cyanide exclusively from Cyanco's Houston Production Plant under a master cyanide production and delivery (supply) contract; as currently amended, the contract requires that all cyanide be Delivered at Place (DAP) Port of Nouakchott, but does not specifically address responsibilities for handling cyanide between the ocean vessel, the Port of Nouakchott, and the transporter. TMSLA's current contract with Cyanco clearly requires

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

compliance with the ICMC, and review of Cyanco's Global Ocean Supply Chain on the ICMI website indicates that it was certified in September of 2014. At the time of the audit, Cyanco's current Global Ocean Supply Chain certification did not specifically include the Port of Nouakchott. However, the Port was subsequently audited at Cyanco's direction, and an amended supply chain certification was posted on the ICMI website September 30, 2016.

TMSLA has contracted with SOGECO for delivery of cyanide from the Port of Nouakchott to the mine site, and SOGECO responsibilities address all aspects of transport except for the actual unloading at the mine (performed by TMSLA staff). Although SOGECO is currently approved under the ICMC, the current blanket purchase order (PO) with SOGECO viewed at the time of the audit did not explicitly invoke specific requirements for ICMC compliance or applicable responsibilities as listed in ICMC Section 2.1. SOGECO's current ICMC certification assumes that responsibilities for placement of sea containers on SOGECO trailers resides with others (i.e., either the Port of Nouakchott or the ocean carrier). Subsequent to the onsite portion of the audit, the SOGECO PO was modified to include a clause specifically requiring compliance with the ICMC. Also subsequent to the onsite portion of the audit, Cyanco informed TMSLA and ICMI of its intention to add the Port of Nouakchott to its current Global Ocean Supply Chain by completion of a due-diligence report and re-review of its overall supply chain certification. Per ICMI protocols, it is understood that as a transporter holding current global supply chain certification, Cyanco had 9 months from the date of the request to complete the Global Ocean Supply Chain update process. Cyanco's amended certification was posted on the ICMI website September 30, 2016. In the auditors' judgment, TMSLA is considered to be in compliance with this Standard of Practice, given that:

- SOGECO and Cyanco are both currently ICMC-certified transporters;
- SOGECO's services agreement has been modified to clearly invoke ICMC requirements;
- Cyanco is operating within ICMI-established allowances for the addition of a supply chain link for the Port of Nouakchott to its certification;
- Cyanco certified the amended supply chain to include the Port of Nouakchott, approval of which was posted on the ICMI website in September of 2016; and
- TMSLA's cyanide supply contract with Cyanco specifically requires ICMC compliance.

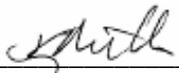
This determination is in keeping with the corresponding section of the *Auditor Guidance for Use of the Gold Mining Operations Verification Protocol*, which permits such acceptance as an alternative to executing a detailed agreement if the mine's transporters are currently certified.

**2.2 Require that cyanide transporters implement appropriate emergency response plans and capabilities, and employ adequate measures for cyanide management.**

The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of Practice 2.2.

***Discuss the basis for the Finding/Deficiencies Identified:***

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

Cyanco's contract specifically requires ICMC compliance; at the time of the audit, SOGECO's contract (blanket PO) did not contain a specific ICMC compliance requirement. Subsequent to the onsite portion of the audit, the SOGECO PO was modified (*Services Agreement No 000762, Amendment 1, dated 1 May 2016*) to include a clause specifically requiring compliance with the ICMC. As noted in 2.1 above, SOGECO and Cyanco are both currently certified transporters. As also noted in 2.1, Cyanco is operating within ICMI-established allowances for the addition of a supply chain link to its existing certification, and as TMSLA's cyanide supply contract specifically requires ICMC compliance, TMSLA is considered to be in compliance with this standard of practice. In the auditors' judgment, his determination is in keeping with Sections 2.1(1) of the *Auditor Guidance for Use of the Gold Mining Operations Verification Protocol* (ICMI, July 2012), which permits such acceptance, as an alternative to executing such a detailed written agreement if the mine's transporters are currently certified. Examination of a sample of chain of custody records (i.e., bills of lading and customs declaration forms for multiple cyanide shipments) indicate that entities certified under the current the Cyanco Global Ocean Supply Chain (plus the Port of Nouakchott) and SOGECO were responsible for all cyanide transportation.

### **3. HANDLING AND STORAGE Protect workers and the environment during cyanide handling and storage.**

#### ***Standards of Practice***

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

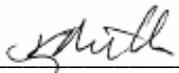
The operation is:      in full compliance  
                                 ■ in substantial compliance  
                                 not in compliance...with Standard of Practice 3.1.

#### ***Discuss the basis for this Finding/Deficiencies Identified:***

Cyanide is purchased exclusively in "bag-in-box" form (i.e., nylon supersacks overpacked with polyethylene-lined plywood pallet boxes), shipped in standard steel intermodal sea-containers. Cyanide is stored in two dedicated, locked, security-fenced and guarded warehouses; one warehouse is located at the main warehousing area near the CIL mixing facility, and the other is several kilometres distant near the ADR facility that services the dump leach part of the operation. The cyanide mixing facility design was sound and generally typical for a bag-in-box operation; both mixing areas have dedicated (one at the CIL, three at the ADR) steel bag-cutting booths with dedicated electric overhead hoists, constructed over steel cutter assemblies and mixing tanks. Mixing and storage tanks all have dedicated sumps and spillage return systems, and concrete-bermed secondary containments. All tanks were fitted with high-level alarms and HCN sensors on the mixing deck. Emergency eyewash/shower arrangements and fire extinguishers were provided at both locations.

The mine site is located in a remote area of the Western Sahara Desert, over 60 km from the nearest village. Security is highly organized and rigorously enforced. The climate at the site

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

is extremely arid, and there are no adjacent surface waters. The ADR and CIL areas are both within guarded security fences, and the ADR and CIL sites themselves are well within multiple concentric security perimeters staffed by a contracted security service, as well as by military patrols established under arrangement with the Mauritanian government.

The cyanide warehouse designs are virtually identical; both warehouses are open-fronted, and constructed on concrete pads with sloped metal roofs and metal-sheathed back and side walls. Cyanide boxes are removed from sea-containers and stacked no more than three high, well back from the edge of the roof and thereby protected in the unusual event that precipitation occurs. Cyanide stocks in both warehouses are rotated so that the oldest received boxes are used first. Both warehouses are dedicated to cyanide storage, and no chemically incompatible materials were stored nearby. All cyanide tanks at both the ADR and CIL mixing areas were fitted with high-level alarms that are also remotely monitored from operations office via electronic control and data acquisition systems.

Bermed concrete containments for the ADR and CIL mixing and storage tanks and associated piping systems were observed to have significant areas of degradation, including spalling, surface cracks, and loss of caulking. Subsequent to the onsite portion of the audit TMSLA initiated a repair campaign to repair degraded concrete surfaces, significant portions of which were completed prior to the submittal of this SAR as noted in photographic evidence provided to the audit team. In addition, inspection checklists for the mixing and storage areas were modified to add visual standards as the basis for requesting future repairs. Affected staff were trained in the requirements of the updated inspection sheets and copies were provided to the auditors. See also the discussion in Section 4.1.

TMSLA updated PM instructions to require routine inspections of the integrity of concrete containments on a biannual basis and provided a copy of the updated PM instruction for audit team review. TMSLA also provided copies of records demonstrating that affected PM technicians are trained in the assessment of containment integrity (e.g., detection of open cracks, identification of excessive spalling) per the updated PM.

**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.**

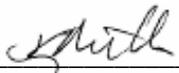
The operation is:     ■ in full compliance  
                              in substantial compliance  
                              not in compliance...with Standard of Practice 3.2.

***Discuss the basis for this Finding/Deficiencies Identified:***

Packaging wastes are periodically removed to a dedicated, posted, fenced, and locked burn pit located in a remote area several kilometres to the southwest of the mine site. Fencing at the burn pit was in good repair, and inspection indicated generally complete combustion and there was no evidence of being used to dispose of any other waste materials.

Procedures *WHS-CN-WIN-001, Cyanide Container Receiving; TAS-ADR-SOP-X.X.X, ADR Plant Cyanide Mixing Procedure; and TAS-ADR-SOP-X.X.X, CIL Plant Cyanide Mixing Procedure*

Tasiast  
Name of Mine

  
Signature of Lead Auditor

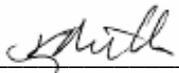
January 3, 2017  
Date

collectively address mixing operations, safe handling, cyanide box staking limits, spill clean-up procedures, and used of PPE and backup operators. Multiple issues were noted with the technical content and implementation of these procedures however, and multiple revisions and clarifications were requested as follows:

- Revise *WHS-CN-WIN-001, Cyanide Container Receiving* to specifically require staging of up to a maximum of 20 boxes (2 rows of 5, stacked 2 high) along the northern edge of the mixing area; this will allow the safe placement of one box at a time by the articulated forklift.
- Revise *TAS CIL SOP X.X.X, CIL Plant Mixing Procedure* as follows:
  - require Mandatory used of hard hats by mix operators due to the overhead hazards;
  - cite specific respirator make and cartridge to be used;
  - note requirement for use of radios to maintain contact with operations center;
  - add special crossbar bag lifting cradle to equipment list;
  - provide a picture to show appropriate wearing of hard hat, raingear on outside of gloves and boots;
  - add instructions to ensure that the forklift places only one box at a time centered under the crane; use forklift tines to carefully pry sides of box open on two sides (as per practice observed during ADR mix), and prohibit the use of crowbars and hammers to pry open boxes;
  - require operator to place bag loops into hooks at the outboard ends of the lifting cradle, to prevent loops from slipping towards center;
  - prohibit any manual shaking of the bag (using jog function on hoist wand control to shake bag);
  - require triple rinse of bag by raising and lowering the cut bag three times with the cabinet closed; and
  - require post-mix washdown of mixing deck
- Revise *TAS CIL SOP X.X.X ADR Plant Mixing Procedure* as per the requests for the CIL version as noted above, and as follows:
  - Prohibit removing the bag from the lifting cradle on the mixing deck and throwing the bag into the empty box; the cut and rinsed bag should be lowered directly into the empty box using the overhead crane
- Replace Perspex viewport on mix cabinets with one with one made of tempered wire-reinforced glass
- Conduct risk assessment and establish defined cartridge replacement guidelines; incorporate in updated SOPs

All requested procedures modifications were completed prior to the submittal of this SAR, along with replacement of the viewport and the defined respirator cartridge guidelines; copies of updated SOPs, training records, and photographic evidence of physical repairs were provided for auditor verification purposes.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

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

***Standards of Practice***

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

The operation is:   ■ in full compliance  
                          in substantial compliance  
                          not in compliance...with Standard of Practice 4.1.

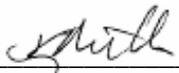
***Discuss the basis for the Finding/Deficiencies Identified:***

Cyanide facilities at TMSLA consist of 1) a dedicated remote cyanide warehouse, a dedicated cyanide mixing and storage facility, an ADR plant, a dump leach facility, and associated barren and pregnant solution pipelines; and 2) a dedicated cyanide warehouse, a dedicated cyanide mixing and storage facility, a CIL plant, an active tailings storage facility (TSF-3), and interconnecting tailings and reclaim water pipelines. A secure burn area for disposal of cyanide packaging residues from both the ADR and CIL operations is also provided. Two other tailings facilities (TSF-1 and TSF-2) are in closure, with (for TSF-2 only) actively pumped collection wells that return seepage back to the CIL process.

TMSLA is developing a comprehensive suite of management plans and procedures for the operation of these facilities; at the time of the audit the primary active cyanide management plans and procedures included the following:

- *TAS-ADR-SOP-X.X.X, ADR Plant Cyanide Mixing Procedure*
- *TAS-CIL-SOP-X.X.X, CIL Plant Cyanide Mixing Procedure*
- **New ADR Plant Operating Procedures**
  - *8.3.1, Carbon Adsorption: Complete/Standby Shutdown*
  - *8.3.2, Carbon Adsorption: Emergency Shutdown*
  - *8.3.3, Power Failure*
  - *8.2.1, Start-Up from Complete/Standby Shutdown*
  - *8.2.2, Start-Up from Emergency Shutdown*
  - *8.2.3, Start-Up from Power Failure*
- **Existing CIL Plant Operational Procedures**
  - *8.3.1, Carbon-in-Leach: Complete/Standby Shutdown*
  - *8.3.2, Emergency Shutdown*
  - *8.3.3, Power Failure*
  - *8.2.1 Start-Up from Complete/Standby Shutdown*
  - *8.2.2 Start-Up from Emergency Shutdown*
  - *8.2.3 Start-Up from Power Failure*
- **Existing CIL Plant Operational Procedures (Tailings)**
  - *8.3.1, (Tailings) Complete/Standby Shutdown*
  - *8.3.2, (Tailings) Emergency Shutdown*

Tasiast  
Name of Mine

  
Signature of Lead Auditor

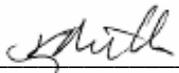
January 3, 2017  
Date

- 8.3.3, (Tailings) Power Failure
- 8.2.1 (Tailings) Start-Up from Complete/Standby Shutdown
- 8.2.2 (Tailings) Start-Up from Emergency Shutdown
- 8.2.3 (Tailings) Start-Up from Power Failure
- Dump Leaching (Operating Procedures)
  - 8.3.1.2 Emergency Shutdown
  - 8.3.1.3 Power Failure
  - 8.2.1.2 Start-Up from Emergency Shutdown
  - 8.2.1.3 Start-Up from Power Failure
  - 8.3.1 Piment Dump Leaching
    - 8.3.1.1 Complete/Standby Shutdown
    - 8.2.1.1 Start-Up from Complete/Standby Shutdown
- TAS-OPS-PRO-00001, Management of Change
- TAS-ENV-PRO-014, Monitoring Plan
- TAS ENV-PRO-004, Hydrocarbon and Chemical Spill Incident Procedure
- TAS-ENV-WIN-026, Environmental Monitoring Borehole Sampling
- TAS-ENV-WIN-026, TSF3 Monitoring Plan
- TAS-ENV-WIN-028, Packaging & Shipping of Environmental Samples
- TAS-ENV-PRO-016, The Development, maintenance, and Use of the Tasiast Site-Wide Water Balance Model
- TAS-PR-INS-000000028, Tailings Routine Inspection

At the time of the audit TMSLA has also developed and implemented initial drafts of the following additional procedures:

- TAS-PR-CHE-000000003, ADR Plant Cyanide mixing task observation
- TAS-PR-CHE-000000004, CIL Plant Cyanide mixing task observation
- TAS-PR-FA-000000002, CIL plant cyanide pre-mix checks field assessment
- TAS-PR-INS-000000007, Carbon In Leach routine inspection
- TAS-PR-INS-000000013, Elution Routine Inspection
- TAS-PR-INS-000000015, TSF3 inspection
- TAS-PR-INS-000000029, Sodium Cyanide Routine Inspection
- TAS-PR-INS-000000065, Piment Dump Leaching Routine Inspection
- TAS-PR-INS-000000066, West Branch Dump Leaching Routine Inspection
- TAS-PR-INS-000000068, Carbon Adsorption Routine Inspection
- TAS-PR-INS-000000070, ADR Acid Wash Routine Inspection
- TAS-PR-INS-000000072, ADR Elution Routine Inspection
- TAS-PR-INS-000000099, CIL reagent area inspection
- TAS-PR-OLS-000000001, CIL Logsheet revised
- TAS-PR-SOP-000000057, Cyanide Titration,
- TAS-PR-SOP-000000065, CIL Circuit Housekeeping,
- TAS-PR-SOP-000000067, CIL Bypassing a Tank for Inspection,
- TAS-PR-SOP-000000077, CIL Plant Cyanide mixing,
- TAS-PR-SOP-000000078, Ripping and levelling leach pads,
- TAS-PR-SOP-000000429, ADR cyanide mixing,
- TAS-PR-SOP-000000431, Ripping and levelling DL
- TAS-PR-SOP-000000432, Response to ponding on DL
- TAS-PR-SP-000000001, Task response to Cyanide spil

Tasiast  
Name of Mine

  
Signature of Lead Auditor

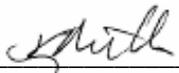
January 3, 2017  
Date

- *TAS-PR-SP-0000000002, Response to cyanide spill*
- *TAS-PR-TRN-0000000006, Acid wash Elution*
- *TAS-PR-TRN-0000000008, Reagents*
- *TAS-PR-TRN-0000000010, CIL*
- *TAS-PR-TRN-0000000011, Acid Wash-Elution*
- *TAS-PR-WIN-0000000001, Cyanide mixing chart*
- *TAS-PR-SP-0000000004, Decontaminated Equipment Form*
- *TAS-PR-SP-0000000003, Decontamination of Cyanide Facilities*

It is understood that the latter were essentially complete and are issued on the TMLSA intranet. An additional group of cyanide management procedures was also noted to be in planning or development; these include:

- *TAS-PR-DEF-0000000945, CIL Plant HCN monitoring system*
- *TAS-PR-INS-0000000005, Ferrous S- Preoperational inspection*
- *TAS-PR-INS-0000000006, Carbon In Leach preoperational inspection*
- *TAS-PR-INS-0000000010, Acid wash preoperational inspection*
- *TAS-PR-INS-0000000011, Acid wash routine inspection*
- *TAS-PR-INS-0000000012, Elution Preoperational Inspection*
- *TAS-PR-INS-0000000017, Leaching Preoperational Inspection*
- *TAS-PR-INS-0000000027, Tailings Preoperational Inspection*
- *TAS-PR-INS-0000000030, Caustic Preoperational Inspection*
- *TAS-PR-INS-0000000038, Ferrous Sulfate Preoperational Inspection*
- *TAS-PR-INS-0000000062, Piment Dump Leaching Preoperational Inspection*
- *TAS-PR-INS-0000000063, West Branch Dump Leaching Preoperational Inspection,*
- *TAS-PR-INS-0000000078, ADR Cyanide Mixing and Distribution Preoperational Inspection*
- *TAS-PR-SOP-0000000058, CIL Start up from complete standby shut down*
- *TAS-PR-SOP-0000000059, CIL Start Up from Emergency Shutdown*
- *TAS-PR-SOP-0000000060, CIL Start Up from Power Failure*
- *TAS-PR-SOP-0000000061, CIL Complete Standby Shutdown*
- *TAS-PR-SOP-0000000062, CIL Emergency Shutdown*
- *TAS-PR-SOP-0000000063, CIL Power Failure*
- *TAS-PR-SOP-0000000064, CIL Operator Duties*
- *TAS-PR-SOP-0000000068, CIL Removal and Cleaning of CIL Screens*
- *TAS-PR-SOP-0000000069, CIL Carbon Concentration and Forwarding*
- *TAS-PR-SOP-0000000073, CIL Using a Density Scale, 0.5*
- *TAS-PR-SOP-0000000088, ILR Pregnant Solution Sampling, 0.5*
- *TAS-PR-SOP-0000000089, ILR Cyanide Titration, 0.5*
- *TAS-PR-SOP-0000000118, Tailings Start Up from Emergency Shutdown*
- *TAS-PR-SOP-0000000119, Tailings Start Up from Power Failure*
- *TAS-PR-SOP-0000000120, Tailings Complete Standby Shutdown 5*
- *TAS-PR-SOP-0000000121, Tailings Emergency Shutdown*
- *TAS-PR-SOP-0000000122, Tailings Power Failure*
- *TAS-PR-SOP-0000000124, Tailings Dam Management*
- *TAS-PR-SOP-0000000125, Changing Over Tailings Pump*
- *TAS-PR-SOP-0000000126, Tailings Using a Density Scale*
- *TAS-PR-SOP-0000000127, Tailings Dam Water Recovery*

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

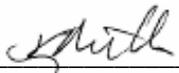
- *TAS-PR-SOP-0000000128, Tailings Start Up From Complete Standby Shutdown*
- *TAS-PR-SOP-0000000129, Sodium Cyanide Start Up*
- *TAS-PR-SOP-0000000131, Sodium Cyanide Shutdown*
- *TAS-PR-SOP-0000000132, Sodium Cyanide Preparing a Batch of Sodium Cyanide Solution*
- *TAS-PR-SOP-0000000144, Ferrous Sulfate Start Up*
- *TAS-PR-SOP-0000000145, Ferrous Sulfate Shutdown*
- *TAS-PR-SOP-0000000146, Ferrous Sulfate Preparing a Batch of Ferrous Sulfate*
- *TAS-PR-SOP-0000000163, Dump Leach Start Up from Emergency Shutdown*
- *TAS-PR-SOP-0000000164, Dump Leach Start Up from Power Failure*
- *TAS-PR-SOP-0000000165, Piment Complete Standby Shutdown*
- *TAS-PR-SOP-0000000166, Dump Leach Emergency Shutdown*
- *TAS-PR-SOP-0000000167, Cleaning the Leach Solution Strainers*
- *TAS-PR-SOP-0000000168, Dump Leach Power Failure*
- *TAS-PR-SOP-0000000208, ADR Gold Room Start Up from Emergency Shutdown*
- *TAS-PR-SOP-0000000221, ADR Cyanide Mixing and Distribution Start-Up*
- *TAS-PR-SOP-0000000222, ADR Cyanide Mixing and Distribution Shutdown*
- *TAS-PR-SOP-0000000223, ADR Cyanide Mixing and Distribution Preparing a Batch of Cyanide Solution for the DL*
- *TAS-PR-SOP-0000000224, ADR Cyanide Mixing and Distribution Preparing a Batch of Cyanide Solution for Elution*
- *TAS-PR-SOP-0000000225, ADR Caustic Mixing and Distribution Start-Up*
- *TAS-PR-SOP-0000000226, ADR Caustic Mixing and Distribution Shutdown*
- *TAS-PR-SOP-0000000433, Piment Start Up from Complete Standby Shutdown*

As noted previously, mining and mineral processing operations were halted and the site was placed on care and maintenance until the August 2 restart. During most of this period (May 24th - July 26th), virtually all Tasiast employees and contractors were evacuated from the site. When site operations resumed and project staff began to return (and new staff hired), in order to ensure safe operations, TMSLA training protocols required all workers to undergo re-induction and refresher training, including training on the storage, handling, and use of cyanide. Discussions with TMSLA management indicate that from July 27 till mid-December, a total of 3,964 retraining hours were delivered to 774 workers (210 Kinross and 564 contractors). Two iterations of a standard training planning requirements/delivery tracking matrix and examples of training records were also provided as objective evidence that retraining is proceeding in an organized and systematic manner.

Cyanide facility design parameters are documented in a series of design reports and management plans, including:

- *Tasiast Tailings Disposal Project Process Control Philosophy (Lycopodium, 2012);*
- *Tasiast Mauritanie Ltd SA, Dump Leach Project, Tasiast Mine Site - Process Design Criteria (Lycopodium, December 2011);* this report documents design criteria for the as-built West Branch and Piment Dump Leach Facility and ADR plant.
- *Tasiast Gold Mine Dump Leach Facility – Design and Construction Report (FINAL Complete) URS/Scott Wilson, January 2011.*

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

Corresponding or analogous design reports were not located for the CIL facility; however, TMSLA completed an independent engineering review of the CIL after the August restart. Please see Section 4.8 for a detailed discussion.

In addition to the key plans and procedures for cyanide facility operation listed above, TMSL also has established a series of monitoring and inspection procedures:

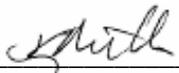
- *TAS-ALL-SOP-009, Fire Extinguisher Inspection*
- *TAS-ENV-PRO-014, Monitoring Plan*
- *TAS-ENV-WIN-026, Environmental Monitoring Borehole Sampling*
- *TAS-ENV-WIN-026, TSF3 Monitoring Plan*
- *TAS-ENV-WIN-028, Packaging & Shipping of Environmental Samples*
- *TAS-PR-INS-000000028, Tailings Routine Inspection*

A computerized PM system (JD Edwards) has also been installed in keeping with Kinross corporate standards.

During the onsite portion of the audit, multiple leaks in tailings and reclaim water pipelines were noted in a sample of readily accessible sections of the HDPE-lined pipeline trench system connecting the CIL facility to TSF-3. Associated inspection records for the previous week and the day in question did not note any pipeline leaks. It was also observed that inspections records were not legible when scanned and entered into the online records management system. Records review also indicated that several different iterations of applicable pipeline inspection forms were being used. However, corrective action to repair the noted leaks was immediately initiated on the day observed; also, prior to the submittal of this SAR, TMSLA updated the solution pipeline inspection SOP to emphasize adequacy and completeness of tailings pipeline trench inspections and the accuracy of associated inspection records; associated checklists were updated to provide greater detail, including buyoffs for specific sections of the pipeline in order to increase assurance that daily checks are routinely conducted on all sections of pipeline. A copy of the updated SOP (*TAS-PR-INS-000000028, Tailings Routine Inspection*) and associated inspection form was provided for auditor review, along with records of retraining of all affected staff emphasizing the importance of rigorous compliance with the SOP, requirements for legibility in records, and requirements for the use of a single approved inspection form. TMSLA was also requested to develop an SOP (or modify an existing SOP) for identification and removal of cyanide salt deposits where leakage is detected and corrected on valves and flanges throughout the solution distribution system. This request was based on observations at the West Branch intermediate/barren pipeline connection near the collection boxes. The condition at West Branch occurs when supply to the dump leach is changed between intermediate and barren. This problem will be corrected when the planned "Y" junction/valve is installed at these locations. Removal of salts is required to ensure resolution of leaks and to minimize hazards to field personnel; clean-up of the noted areas was completed subsequent to the onsite portion of the audit and photographic evidence provided for auditor review, along with a copy of the updated SOP and associated training records.

TMSLA had prepared procedure *TAS-OPS-PRO-00001, Management of Change*, but the procedure had not been fully implemented at the time of audit; an interim Management of Change (MOC) procedure specific to CIL operations was noted to have been drafted by a contractor, but had not been formally issued as a TMSLA procedure. Prior to the submittal date of this SAR, however, *TAS-OPS-PRO-00001* was simplified and issued for use on the

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

TMSLA intranet. Retraining of affected staff is proceeding as part of the retraining program described in 4.1(1).

TMSLA has also established a suite of procedures specifically designed to manage the ADR, dump leach, CIL and tailings storage facilities in non-emergency and emergency shutdown scenarios, as well as the controlled startup after any such event. These include:

New ADR Plant Operating Procedures:

- 8.3.1, Carbon Adsorption: Complete/Standby Shutdown
- 8.3.2, Carbon Adsorption: Emergency Shutdown
- 8.3.3, Power Failure
- 8.2.1, Start-Up from Complete/Standby Shutdown
- 8.2.2, Start-Up from Emergency Shutdown
- 8.2.3, Start-Up from Power Failure

Existing CIL Plant Operational Procedures:

- 8.3.1, Carbon-in-Leach: Complete/Standby Shutdown
- 8.3.2, Emergency Shutdown
- 8.3.3, Power Failure
- 8.2.1 Start-Up from Complete/Standby Shutdown
- 8.2.2 Start-Up from Emergency Shutdown
- 8.2.3 Start-Up from Power Failure

Existing CIL Plant Operational Procedures (Tailings):

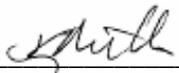
- 8.3.1, (Tailings) Complete/Standby Shutdown
- 8.3.2, (Tailings) Emergency Shutdown
- 8.3.3, (Tailings) Power Failure
- 8.2.1 (Tailings) Start-Up from Complete/Standby Shutdown
- 8.2.2 (Tailings) Start-Up from Emergency Shutdown
- 8.2.3 (Tailings) Start-Up from Power Failure

Dump Leaching (Operating Procedures)

- 8.3.1.2 Emergency Shutdown
- 8.3.1.3 Power Failure
- 8.2.1.2 Start-Up from Emergency Shutdown
- 8.2.1.3 Start-Up from Power Failure
- 8.3.1 Piment Dump Leaching
  - 8.3.1.1 Complete/Standby Shutdown
  - 8.2.1.1 Start-Up From Complete/Standby Shutdown

As evidenced by field observation, review of records, and discussion with TMSLA management, the routine inspection and reporting program by process operators was not functioning effectively. Inspections are not being undertaken at the required frequency (see 6.3), or inspections forms are not being completed correctly [e.g., daily fire extinguisher inspections (see section 6.2)] and weekly tailing and reclaim line leak inspections), or records were not properly maintained. TMSLA will need to develop and implement an effective inspection and inspection records retention program, update affected SOPs as required, and train workers to comply with the program. Prior to the submittal of this report, TMSLA updated the

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

tailings/reclaim pipeline inspection SOP and inspection sheets, strengthened requirements for retention of legible inspection records, and retrained affected staff. Copies of the updated SOP, inspection forms, and training records were provided for auditor verification.

As noted above, TMSLA has prepared (or is in the process of preparing or updating) a wide range of procedures for unloading, storage, mixing, and processing cyanide; inspection-related procedures include:

a) for tanks holding cyanide solutions:

- *TAS-PR-FA-000000002, CIL plant cyanide pre-mix checks field assessment*
- *TAS-PR-INS-000000007, Carbon In Leach routine inspection*
- *TAS-PR-INS-000000013, Elution Routine Inspection*
- *TAS-PR-INS-000000029, Sodium Cyanide Routine Inspection*
- *TAS-PR-INS-000000068, Carbon Adsorption Routine Inspection*
- *TAS-PR-INS-000000070, ADR Acid Wash Routine Inspection*
- *TAS-PR-INS-000000072, ADR Elution Routine Inspection*
- *TAS-PR-SOP-000000067, CIL Bypassing a Tank for Inspection*

b) secondary containments for their integrity, the presence of fluids and their available capacity:

- *TAS-PR-INS-000000028, Tailings Routine Inspection*
- *TAS-PR-INS-000000007, Carbon In Leach routine inspection*
- *TAS-PR-INS-000000068, Carbon Adsorption Routine Inspection*
- *c) Leak detection/seepage collection systems at leach pads and ponds:*
- *TAS-PR-INS-000000065, Piment Dump Leaching Routine Inspection*
- *TAS-PR-INS-000000066, West Branch Dump Leaching Routine Inspection*

d) pipelines, pumps and valves for deterioration and leakage:

- *TAS-PR-INS-000000028, Tailings Routine Inspection*
- *TAS-PR-INS-000000068, Carbon Adsorption Routine Inspection*
- *TAS-PR-INS-000000070, ADR Acid Wash Routine Inspection*
- *TAS-PR-INS-000000072, ADR Elution Routine Inspection*

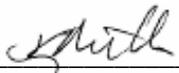
e) ponds and impoundments for the parameters critical to their containment of cyanide and solutions and maintenance of the water balance

- *TAS-ENV-PRO-016, The Development, Maintenance, and Use of the Tasiast Site-Wide Water Balance Model*
- *TAS-PR-INS-000000015, TSF3 inspection*
- *TAS-PR-INS-000000065, Piment Dump Leaching Routine Inspection*
- *TAS-PR-INS-000000066, West Branch Dump Leaching Routine Inspection*

The JD Edwards PM system also tracks and prompts routine inspection/maintenance actions for major tanks, pumps, valves, HCN monitors, the TAS 1000 analyzer, and other equipment with cyanide management-related functions.

It should be noted that, as evidenced by field observation, review of records, and discussion with TMSLA management during the onsite portion of the audit, the routine inspection

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

program was not observed to functioning effectively. For example, some inspections were not being undertaken at the required frequency; in some cases, inspections forms were not being completed correctly, and records were not properly maintained. TMSLA was requested to develop and implement an effective inspection and inspection records retention program, update affected SOPs as required, and train workers to comply with the program. Prior to the submittal of this report, TMSLA updated the tailings/reclaim pipeline inspection SOP and inspection sheets, strengthened requirements for retention of legible inspection records, and retrained affected staff. Copies of the updated SOP, inspection forms, and training records were provided for auditor verification.

The PM system encompasses all major equipment items in the mill, CIL, ADR, TSF-3, the West Branch and Piment DLFs, and ancillary facilities. Summary-level PM instructions are incorporated for each equipment item entered into the system. Routine PM schedules are automatically established for each item and associated work orders are generated. The PM system is also designed to respond to specific work order requests on a prioritized basis, with cyanide-related issues or equipment being assigned the highest priority.

All electricity is generated on site; discussions with TMSLA management and review of records indicates that TMSLA has installed three 2.7MW heavy fuel oil generator sets, and has eight 1MW diesel generators available as backup. Smaller portable generator sets are available to support specific project activities (e.g., sampling of water quality wells using submersible pumps). All emergency generators are subject to monthly run tests per *TAS TRE-WIN-XXX, Test Run Emergency Generators – Work Instruction*, scheduling of which is generated by the JD Edwards PM system. Run test records are documented on *TAS-TRE-FRM-XXX, Test Run Emergency Generators – Inspection Form*. A dedicated emergency generator has also been installed for operation of the decant and seepage pumps at TSF-3.

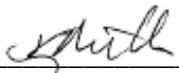
**4.2 Introduce management and operating systems to minimize cyanide use, thereby limiting concentrations of cyanide in mill tailings.**

The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of Practice 4.2.

***Discuss the basis for this Finding/Deficiencies Identified:***

TMSLA has installed TAC 1000 automated online cyanide monitors and controllers, which are designed to regulate, and if possible minimize the use of cyanide at the CIL plant. The controller monitors operational parameters at the CIL plant as well as actual automatically titrated cyanide values, in order to determine the amount of cyanide that should be added relative to set points established by the chief metallurgist. Manual titrations are still conducted as backups to the automated titrations performed by the controllers.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

**4.3 Implement a comprehensive water management program to protect against unintentional releases.**

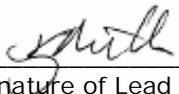
The operation is: ■ in full compliance  
                          in substantial compliance  
                          not in compliance...with Standard of Practice 4.3.

***Discuss the basis for the Finding/Deficiencies Identified:***

Records review and discussions with TMSLA staff indicate that TMSLA contracted with Schlumberger Water Services (SWS) in 2013 to develop a site-wide probabilistic water balance using the GoldSim™ software platform. The water balance was originally documented in SWS report 52466R1, *Tasiast Side-Wide Water Balance (December 2013)* and, per Section 1.1.1, "International Cyanide Management Code Requirements", is designed specifically to address the minimum requirements of this Standard of Practice. SWS provides quarterly calibration reports in response to data inputs provided by Tasiast staff, which are governed by procedure *TAS-ENV-PRO-016, The Development, Maintenance, and Use of the Tasiast Site-Wide Water Balance Model*. The latter is designed to comply with a Kinross corporate standard (*Kinross Environmental Standard 10.06, Water Management*) and this ICMC Standard of Practice. Review of the current water balance report indicated the following:

- The model incorporates total volumes and flow rates of tailings deposition TSF 3 and barren solution application at the Piment and West Branch DLFs; these data are reported to SWS on a quarterly basis using an Excel spreadsheet (Tasiast Water Balance Transfer Record).
- The current water balance report does not specifically define a design storm event, but does undertake a detailed analysis of precipitation data to assess the potential for flooding based on realistic site-specific climate data. SWS conducted a detailed evaluation of site-specific precipitation conductions in a technical memorandum attached to the (December 2013) report. These data were used to develop a stochastic precipitation model, which was then compared against historical records to determine if the mean and extreme precipitation values generated by the model were representative of actual observed conditions. The evaluation concludes that the historic precipitation and stochastically generated precipitation values had similar probabilities that suggest the model appropriately simulates mean and extreme values of precipitation. The assessment also notes that due to the natural climate of the region, daily and monthly rain events, although low frequency, may be very intense and are the most likely to cause flood events. Historically it is not uncommon for a daily precipitation value at the mine site to be near the monthly or even annual total.
- Four regional meteorological stations in the vicinity of the mine were evaluated by SWS in the development of the water balance model; this included the stations at Akjoujt, F-Derik, Nouadhibou, and Zouerate. In addition, three stations were installed at the site's power station, the TSF-3 starter cell, and the airport. SWS's evaluation is documented in a technical memorandum appended to the SWS water balance report.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

- TSF-3 and the Piment and West Branch DLAs are built on flat, low-relief terrain; there are no upgradient sources of run-on apart from precipitation to the beach areas of TSF-3 that might report as sheet flow to the decant pond. The model accounts for the infiltration of precipitation to the surface of the DLAs and the beach areas of TSF-3.

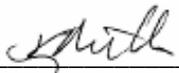
The site is located in a remote, arid region of the western edge of the Sahara Desert, and there are no freezing or thawing effects that must be accounted for. The model accounts for evaporation and solution losses to the decant pond, the drainage and reclaim systems, and seepage to the subsurface. There are no discharges in normal operating conditions and there are no surface water features that would be impacted by upset conditions. The water balance model can simulate a major power outage or similar unforeseen downtime event at the mine. The occurrence and duration of an outage is controlled by a stochastic event element in the model. At the DLAs, in the event of a major outage with no backup generation capabilities, pumping would cease, and the outflow from the leach pads would increase the levels of solution in the ponds. If the barren pond were to overflow, excess water would report to the pregnant solution pond. If the pregnant pond were to then overflow, excess water would go to the intermediate pond. If the intermediate pond were to overflow, excess water would flow to the surrounding environment; however, as previously noted no surface water features exist that would be potentially impacted by such overflows. Backup generation capabilities are provided for the site and can be accounted for by the model in the prediction of actual conditions.

There are no surface water features at the Tasiast site; TSF-3 and the West Branch and Piment dump leach facilities are operated as closed systems. However, the model is capable of evaluating the possibility of upset conditions that would result in loss of containment and alerts the user if any such event would occur in a predicted upset scenario. In addition to be able to simulate a major power outage, the model is also capable of simulating the effects of an unforeseen downtime event at the mine and supporting decisions on how best to manage tailings and decant water in TSF-3 and the process solution in the DLFs and associated solution ponds.

*TAS-ENV-PRO-016, The Development, Maintenance, and Use of the Tasiast Site-Wide Water Balance Model* requires specific monitoring data inputs to be provided by Tasiast staff; data are reported to SWS on a quarterly basis using the *Tasiast Water Balance Transfer Record* (an Excel spreadsheet). In addition, TSF-3 and the West Brand/Piment DLFs and associated solution ponds are subject to daily inspections in accordance with *TAS-PR-INS-0000000015, TSF3 inspection*; *TAS-PR-INS-0000000065, Piment Dump Leaching Routine Inspection*; and *TAS-PR-INS-0000000066, West Branch Dump Leaching Routine Inspection*.

TSF-3 was designed with an additional 1m of freeboard, which is reflected in the *Tasiast Gold Mine Tailings Storage Facility No. 3 Starter Cell Operation, Maintenance and Surveillance Manual* (Klohn Crippen Berger, November 2012). *Tasiast Tailings Disposal Project Process Control Philosophy* (Lycopodium, 2012) establishes basic process control parameters that requires maximising the recovery of TSF-3 decant water, which is routed to the barren solution collection ponds at the DLF. The TSF-3 decant pond is therefore kept as pumped down as possible; this practice maximizes available freeboard while minimizing makeup water needs at the DLFs.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

SWS provides quarterly calibration reports in response to data inputs provided by Tasiast staff, which are governed by procedure *TAS-ENV-PRO-016, The Development, Maintenance, and Use of the Tasiast Site-Wide Water Balance Model* and specifically include updated precipitation data. The calibration reports provided by SWS summarize operational changes that have occurred in the reporting interval, updated data, results of model calibration, forward projections of the updated model, and conclusions which include specific suggestions for revisions of operating practices and considerations for future planning efforts (e.g., development of appropriate closure plans for the DLFs). SWS is also directly responsible for periodic updates to *TAS-ENV-PRO-016* if calibration results indicate that procedural modifications are required.

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

The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of Practice 4.4.

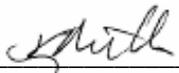
***Discuss the basis for the Finding/Deficiencies Identified:***

Review of daily cyanide concentrations in TSF-3 for March, 2016 indicates that concentrations in as-deposited tailings (measured at the spigot) ranged from 1.63 to 8.06 mg/L WAD cyanide averaging 3.18 mg/L. Pregnant, intermediate and barren solution collection ponds have been constructed at the West Branch and Piment DLF solution collection ponds. WAD cyanide concentrations are reportedly >50 mg/L in the pregnant and barren ponds, and full fencing and bird netting was observed to have been provided for exclusion of wildlife from those ponds. The intermediate ponds reportedly have <50 mg/L WAD cyanide, which may permit removal of bird netting, and one new intermediate pond was also observed to be under construction at the West Branch DLF. TMSLA was requested to assemble recent summaries of monitoring data for all ponds to confirm those for which bird netting/fencing will be required, as well as the QA/QC data package for the newly constructed pond (see Standard of Practice 4.8), and confirmatory photographs demonstrating installation of bird nets, fencing, and appropriate warning signage at all ponds with measured WAD cyanide values >50 mg/L. The requested data and photographs demonstrating satisfactory bird netting installations were provided for audit team verification prior to the submittal of this report.

Observations of wildlife are rare at the site, as are wildlife mortalities. Records indicated 52 mortalities in all species (several species of birds, fennec foxes, and 2 species of snakes) since September 2012; of these, only 10 involved cyanide facilities (primarily in the TSF-2 seepage collection channels) and none of the deaths appear to be attributable to the presence of cyanide. Migratory bird mortalities do occasionally occur; the most significant appear to involve mostly juvenile storks who have blown inland from coastal flyways.

Occasional areas of ponding were observed in initial observations made on top of the West Branch DLF. However, evaporation rates are high and subsequent inspections indicated that ponding conditions can be readily managed by reducing the solution application rate; the surface of the pad can be drained in less than one workday. TMSLA modified the pad operation/inspection SOPs to require adjustment of flow rate to minimize ponding effects, and

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

to include a photographic standard as a visual reference for what constitutes an unacceptable level of ponding. Prior to the submittal of this SAR, a copy of *TAS-TRE-PRO-0010, Response to Ponding on Leach Pad* was provided for review, as well as associated training records.

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

The operation is: ■ in full compliance  
in substantial compliance  
not in compliance...with Standard of Practice 4.5.

***Discuss the basis for the Finding/Deficiencies Identified:***

This Standard of Practice does not apply as TMLSA operates as a closed system and there are no direct discharges to surface water. TMLSA is located in a dry desert region of the African Sahara and there are no surface water bodies located near to the property that could be impacted by indirect discharge.

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

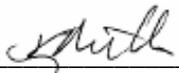
The operation is: ■ in full compliance  
in substantial compliance  
not in compliance...with Standard of Practice 4.6.

***Discuss the basis for the Finding/Deficiencies Identified:***

Under the 1991 (amended 2006) Mauritanian Constitution the regulation of water is governed by the Ministry of Water and Sanitation who are responsible for protection of water resources and abstraction; Ministry of Environment and Sustainable Development for pollution control and environmental emergencies; and Ministry of Petroleum, Energy and Mines for regulating the mineral industry and associated environmental management. The primary environmental legislation governing water quality are the Environment Code No. 2000-045 (26 July 2000) and the Water Code No. 2005-030 (2 February 2005). These documents however do not provide specific standards relevant to assessing substances in groundwater. As a result, international standards and guidelines with regard to groundwater protection are referenced for applicable standards for protection of beneficial use of groundwater.

Because of the absence of surface water the protection of aquatic life is not an issue. Groundwater analytical data collected from the site shows it to be saline with total dissolved solids (TDS) ranges between 20 and 50 g/L. Groundwater with TDS levels of greater than 10 g/L is considered non-beneficial as it is unsuitable for potable water and cannot be used for irrigation or as feed for livestock. The groundwater beneath the site is considered to have no beneficial use. Mill tailings are not used as underground backfill. Nevertheless, TMLSA has

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

protective measures in place, included secondary containment for process tanks and pipelines, and HDPL lined dump pads, ponds, and operating tailings facility, to protect groundwater from contaminant releases. A groundwater monitoring program is also in place. When significant levels of cyanide were detected in monitoring well MBH1 during scheduled quarterly groundwater monitoring in 2011, TMLSA voluntarily implemented remedial measures to prevent further degradation and reduce potential risk to workers and ecological receptors. This contamination was determined to be the result of seepage beneath TSF2 which had been constructed prior to Kinross's ownership of the site. The TSF2 was not constructed with a basal liner and condemnation boreholes within the footprint had not been fully abandoned prior to facility construction. SRK Consulting (SRK) was commissioned to design a perimeter groundwater extraction system and this was installed and operation by November 2012. The extraction system comprised six wells that pumped 24-hrs a day. TMLSA ceased use of TSF2 in December 2012. The results of groundwater monitoring showed that cyanide concentrations peaked in July 2013 with total cyanide of 30.4 mg/L in Extraction Well GW01 located at the north perimeter of TSF2. SRK determined that the majority of the cyanide was associated with ferricyanide complexes and therefore relatively stable. As of September 2013 SRK reported that the abstraction system had removed 184,292m<sup>3</sup> of water, which equated to the removal of approximately 1,579kg of cyanide from the groundwater. Typical cyanide concentrations were reported to be 10.7 mg/L total cyanide, 1.9 mg/L WAD cyanide and 1.6 mg/L free cyanide.

SRK was also commissioned to conduct a risk assessment to assess the potential long term risk to workers and ecological receptors. The assessment modelled the migration of a contaminant plume over time and took into account the reduction of groundwater mound within TSF2, the reduction in efficiency and limited life of the extraction system as the groundwater table lowers, and influence of providing a cap over TSF2. The plume pathway would be toward the West Branch and Piment pits. The migration of cyanide from the TSF in groundwater was assessed using the predictive groundwater model. The model was extended beyond the projected operational period (2025) until 2150 to simulate how the rebound of the pits and formation of the pit lakes may affect the groundwater regime. SRK concluded that future cyanide concentrations at the pit and pit lake are not likely to exceed receptor screening criteria, therefore the risks to pit lake receptors is very low, and no mitigation measures are required to reduce risk to receptors at the pit lakes. The abstraction wells were remove a moderate amount of cyanide in the short term but have negligible beneficial effects over the long term, and operation of these wells is not required to protect receptors.

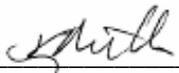
**4.7 Provide spill prevention or containment measures for process tanks and pipelines.**

The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of Practice 4.7.

***Discuss the basis for the Finding/Deficiencies Identified:***

Bunded concrete impoundments have been constructed for the cyanide mixing and high-strength solution storage tanks and associated piping system components, at both the ADR

Tasiast  
 Name of Mine

  
 Signature of Lead Auditor

January 3, 2017  
 Date

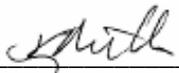
and CIL plants. As noted in Section 3.1, bermed concrete containments for ADR and CIL mixing and storage facilities were observed to have significant areas of degradation, including spalling, surface cracks, and loss of caulking. At the ADR, it was also noted that the concrete containment receives vigorous overflow of barren solution on at least a daily basis; the barren solution tank was observed to overflow when Piment dump leach facility (DLF) flow was added to flow from the West Branch DLF. Discussions with TMSLA staff indicated that the speed set point for the pump cannot handle the additional flow. The overflow was observed to stop after 15 to 20 minutes; sump pumps return the overflow solution back to the process and the system recovers. However, repetitive scouring action from the overflows appears to be degrading the integrity of containment.

Subsequent to the audit TMSLA provided an update to procedure *TAS-PR-SOP-000000069, Carbon Adsorption Start Up from Complete Shutdown Procedure* in order to better manage the flow through the ADR barren solution pumps and prevent chronic overflows into the bunded containment. Training records for affected operators were also provided. TMSLA also initiated a repair campaign to repair degraded concrete surfaces, portions of which were completed prior to the submittal of this SAR as noted in photographic evidence provided to the audit team. In addition, inspection checklists for the mixing and storage areas were modified to add visual standards as the basis for requesting future repairs. Affected staff were trained in the requirements of the updated inspection sheets and copies provided to the auditors. However, the repair campaign was not fully completed at the point operations were suspended. Repairs resumed in concert with the resolution of requested corrective actions resulting from the independent engineering review conducted under Section 4.8. TMSLA updated PM instructions to require routine inspections of the integrity of concrete containments on at least a biannual basis and provided a copy of the updated PM instruction for audit team review. Training is proceeding systematically as part of the general retraining programs required after the August 2015 restart; see Section 4.1(1) for additional discussion.

TMSLA was also requested to survey all bunded concrete containments at the ADR and CIL facilities and to complete documented volume calculations for each containment to ensure they meet a nominal 110 % of the largest contained tank, plus potential flowback, plus contribution of design storm event volume capacity; volume reductions from tank plinths, pump bases, and other structures will also be taken into account. Where the current containment may not provide the suggested capacity, it should be modified as required. A containment survey was completed prior to the submittal date of this SAR. Repairs were completed and a copy of the survey and completion photographs were provided for audit team verification, prior to the submittal of this report.

All of the concrete impoundments in the ADR, CIL, and associated cyanide mixing and storage facilities are constructed with collection sumps fitted with dedicated pumps designed to return spillage or other cyanide-contaminated water directly to the process. There are no specific surface water protection needs, as the mine is located in an extremely arid desert setting, and there are no surface water features near the ADR, CIL, dump leach, or tailings storage facility.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

Cyanide tanks and pipelines are constructed of carbon steel, with some valves, flowmeters, and other piping system components constructed of stainless steel. Solution pipelines are typically constructed of carbon steel or HDPE.

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

The operation is:      in full compliance  
                                 ■ in substantial compliance  
                                 not in compliance...with Standard of Practice 4.8.

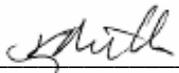
***Describe the basis for the Finding/Deficiencies Identified:***

The records for the Piment and West Branch Dump leach facilities, the ADR and associated cyanide mixing and storage area, TSF-3, and the lined trench with seepage collection, tailings, and reclaim water pipelines connecting the CIL facility to TSF-3 include signature buyoffs on as-built drawings indicative of the application of appropriate quality assurance /quality control (QA/QC) programs to the design and construction of the noted facilities; see 4.8(3) below. However, corresponding or analogous QA/QC program records were not located for the CIL facility. TMSLA has commissioned an independent engineering review per Standard of Practice 4.8(5). The as-built records for the Piment and West Branch Dump leach facilities, the ADR and associated cyanide mixing and storage area, TSF-3, and the lined trench with seepage collection, tailings, and reclaim water pipelines connecting the CIL facility to TSF-3 address the noted details; see 4.8(3) below. Aat the time of the audit, corresponding or analogous QA/QC program records were not located for the CIL facility of for areas of the mill that may use reclaim water with WAD cyanide concentrations >0.5 mg/L. Hoiwever, TMSLA had commissioned an independent engineering review per Standard of Practice 4.8(5), to be conducted by GBM Minerals Engineering Consultants Ltd (GBM). After the August 2 facility restart occurred, GBM completed the review in two phases, results of which were documented in two reports:

- Tasiast Gold Project - Engineering Evaluation of Cyanide Storage and Preparation Areas, Report 0546-RPT-001 (GBM, October 7, 2016); and
- Tasiast Gold Project - Tasiast CIL Plant Engineering Review, (GBM, November 13, 2016).

Each report contained a series of recommended repairs and improvements; as of the submittal date of this report, TMSLA has provided photographs and objective evidence of completion of the recommended corrections in the cyanide storage and preparation area, and has scheduled the necessary projects to resolve all recommendations in the CIL plant report. Review of the requested corrective actions (documented in Table 6-1 Report 0547-RPT-001), the project schedule, and completion photographs and tracking information provided by TMSLA indicates that as of the submittal date of this report, all requested repairs have been completed. In the auditor's judgment, none of the conditions for which action was requested by the independent

Tasiast  
Name of Mine

  
\_\_\_\_\_  
Signature of Lead Auditor

January 3, 2017  
Date

engineer represent a significant environmental or occupational health and safety risk, and the objective evidence provided indicates that TMSLA has engaged in a good faith effort not only in commissioning a thoughtful independent engineering review by a qualified firm (GBM), but in systematically resolving both the mandatory corrective actions and suggested recommendations made by the GBM reports.

As-built certifications indicated the completion of QA/QC inspection processes have been provided for the Piment and West Branch Dump leach facilities, the ADR and associated cyanide mixing and storage area, TSF-3, and the HDPE-lined trench with seepage collection, tailings, and reclaim water pipelines connecting the CIL to TSF-3; acceptance by licensed professional engineers is documented.

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

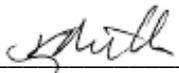
The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of Practice 4.9.

*Describe the basis for the Finding/Deficiencies Identified:*

An *Environmental Monitoring Plan* (TAS-ENV-PRO-014) was developed for the site in 2010 by the Scott Wilson Group. This Plan provides the framework to maintain compliance with Mauritanian Law, international environmental standards and environmental commitments and obligations required at the Tasiast mine. The monitoring program objectives, design, sampling and analytical protocols, quality control and assurance, schedule, and reporting procedures for all environmental monitoring are documented in the Plan. The Environmental Department reviews and updates the Plan as required or at least annually to ensure that the program is up-to-date and appropriately designed. The Plan was last updated 29 June 2015. The Plan is supported by a number of written procedures that include *TAS-ENV-WIN-028 - Packaging and Sampling of Environmental Samples*; *TAS-ENV-WIN-026 – Environmental Monitoring Borehole Sampling*; and *TAS-ENV-WIN-032 - TSF3 Sampling*. *Environmental Monitoring Plan (TAS-ENV-PRO-014)* was developed initially for the site in 2010 by environmental specialists within the Scott Wilson Group. The Plan was designed to meet the requirements set out in the Environmental Impact Study (EIS) that formed an integral part of the development permit and approval for the mine under Mining Environmental Degree No. 2004-054. Subsequently the Plan and associated procedures have been reviewed and updated by senior environmental staff at TMLSA. The auditors reviewed the qualifications of environmental staff responsible for reviewing, updating and approving the sampling and analytical protocols for the surface and ground water monitoring programs. These professionals have university degrees in the environmental engineering, hydrogeology or fisheries/aquaculture disciplines and continue to be involved in ongoing education and training.

The *Environmental Monitoring Plan* includes a map showing the locations of all groundwater monitoring wells and an annual schedule for the sampling and monitoring program. A monitoring and sampling schedule is prepared at the beginning of each year that follows the schedule presented in Appendix A of the Plan. Sampling protocols are presented in standard

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

operating procedures. Procedure *TAS-ENV-WIN-026 – Environmental Monitoring Borehole Sampling* provides detailed instruction on groundwater well purging and sampling and specifies PPE requirements, pump operation, sampling bottle preparation, and sampling bailer operation. The procedure also details the specifications of each well (location sampling frequency, pump depth setting, depth and diameter of borehole and appropriate sampling method); lists sampling equipment; and provides procedures for measurement of static water levels, setting up and use of groundwater sampling bailers and pumps, sample container preparation, and sample handling and preservation. Procedure *TAS-ENV-WIN-028 - Packaging and Sampling of Environmental Samples*, provides details of sampling packing and shipping including completion of shipping documents and chain-of-custody forms.

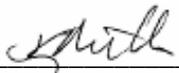
Sampling logs are completed that document the name of the field sampler, date and location of sampling, equipment used, sample number, groundwater purge information (oxygen, conductivity and temperature) and any additional comments on conditions that may influence the quality of the sample. The data is transferred to an online database when the sampler returns from the field and the field logs are filed with the Environmental Department.

There are no discharges to surface water and no surface water bodies within or near the mine property. Groundwater is monitored on a quarterly basis via a series of environmental monitoring boreholes that are strategically located near mine processing infrastructure so that any potential impacts to the environment are captured. As of 2015 there are a total of 18 environmental monitoring boreholes that are sampled to monitor background and downgradient water quality, including Total and WAD cyanide levels.

In addition, there are six operating groundwater extraction wells located around former tailings facility TSF2 that were installed in 2012 after elevated levels of cyanide (peaking at 30.4 mg/L total cyanide) were identified monitoring borehole MBH1 located at the northeast corner of TSF2. These wells are also monitored for cyanide (see Standard of Practice 4.6.

All workers are instructed to report wildlife mortalities or significant encounters (usually snakes or stressed migratory birds) as part of environmental training. Wildlife monitoring is also included as part of documented daily operator inspections for the TSF3 and the return seepage pond, the dump pads, and the West Branch and Piment ponds. In addition, Environmental Department staff conduct wildlife monitoring as part of their daily monitoring and sampling activities. Wildlife encounters or mortalities are reported directly or through security to the Environmental Department. TMLSA operates an environmental incident notification procedure, whereby the causes of the incident are examined, remediation and mitigation measures are implemented, and lessons learned shared between different departments. Wildlife encounters or mortalities are investigated by the Environmental Department using this procedure and *TAS-ENV-FRM-004B, Environmental Incident Investigation and Follow-up Report Form*. The Environmental Department also keeps a spreadsheet of all wildlife sighting. Mortalities are reported annually as part of the *Tasiast Gold Mine Annual Environmental Declaration Report* to the Mauritanian Government. TMLSA monitors groundwater on a quarterly schedule to characterize groundwater quality. The schedule is reviewed annually to determine if changes to the monitoring schedule are necessary and the revised schedule is included the annually updated Environmental Monitoring Plan. Where groundwater quality changes have been noted or incidents have occurred that could impact groundwater quality the schedule has been modified and where needed additional monitoring wells have been installed. This is evidenced in the investigation and

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

monitoring program that was implemented in 2012 after elevated levels of cyanide were detected in monitoring well MBH1. Based on the review of groundwater records, the response record by TMLSA to groundwater protection and the deep groundwater and lack of beneficial use to groundwater within the influence of the mine property due to its high saline nature, the current groundwater monitoring frequency is considered appropriate for the site.

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

**Standards of Practice**

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

The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of 5.1.

**Describe the basis for the Finding/Deficiencies Identified:**

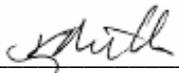
An initial Preliminary Rehabilitation and Closure Plan (PRCP) was prepared for the site in 2009 [*Tasiast Gold Project Environmental Impact Study Addendum IV of IV, Preliminary Rehabilitation and Closure Plan (Scott Wilson, 2008)*]. Under Mauritanian law, the overarching PRCP must be updated and finalized with actionable detail at least two years prior to the cessation of mining. However, the original PRCP has also been reviewed and applied to the conceptual closure needs associated with subsequent project modifications as part of the Environmental Impact Assessment (EIA) process also required under Mauritanian law. This process is documented in phase-specific Rehabilitation and Closure Plans (RCPs), which are focused on the closure issues associated with the noted modifications. Conceptual procedures for cyanide facility closure are included in the PRCP as well as the phase-specific PRCPs. It is understood that final RCPs and cost estimates for the pending closure of TSF-1 and -2 have been submitted for governmental review and approval, and that the review has been ongoing for many months. The PRCP and the modification-specific RCPs discussed in the noted EIA sections contain conceptual implementation schedules. It is understood that these will be finalized when the overarching PRCP is updated at the end of mine life.

**5.2 Establish an assurance mechanism capable of fully funding cyanide-related decommissioning activities.**

The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of Practice 5.2.

**Describe the basis for this Finding/Deficiencies Identified:**

Tasiast  
Name of Mine

  
Signature of Lead Auditor

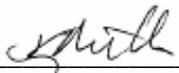
January 3, 2017  
Date

TMLSA prepares annual "Kinross Decommissioning Liability" (KDL) estimates in accordance with Kinross corporate Policy, which forms that basis for the cost estimates included each of the PRCP and RCP documents noted in 5.1 above. Review of the current KDL spreadsheet confirms that estimated costs assume labour rates appropriate for a local third-party contractor. TMLSA prepares KDL estimates at least annually in accordance with Kinross corporate policy.

Mauritanian law requires a financial guarantee for mine site rehabilitation. However, the government has not specified the nature of an acceptable financial mechanism. Absent specific direction, TMLSA has arranged a Letter of Credit (LOC) to address costs, considering mine development in approximately 6-year increments; it has been proposed that the LOC be reviewed for adequacy on an annual basis and adjusted, subject to governmental approval. Where new phases of operation may require an EIA under Mauritanian Law, LOC estimates are included in the EIA. Review of governmental presentations indicates that LOC coverage has been arranged through 2020. However, these efforts notwithstanding, the government has not yet accepted the proposed financial mechanism, nor as of the date of the audit has it provided further guidance on what may be considered an acceptable financial mechanism. TMLSA's proposal has been under review for many months. In the meantime, TMLSA has separately established its own financial assurance mechanism for the Tasiast.

As the government has neither accepted TMLSA's proposed mechanism or provided further guidance on what type of mechanism would be considered to be acceptable, in the auditors' judgment, the requirements of 5.2(5) of the ICMC may be interpreted to apply until such time as the government accepts TMSLA's proposed financial mechanism or provides clarification on what would be considered acceptable. The Kinross "*Internal Code for Self-Insurance of Decommissioning and Closure Liabilities*" was created specifically in response to this ICMC requirement in mine locations in which host nations have not fully developed requirements for a financial assurance mechanism for funding decommissioning and closure of cyanide facilities. The internal code requires that the mine have appropriate ratios of net worth to liabilities (meeting at least two of three acceptable options); net worth at least six times the sum of all cyanide-related decommissioning activities; net worth equal or greater to an established minimum value; and assets worth at least six times the cost of all cyanide-related decommissioning activities, as determined by Kinross's decommissioning liability/asset retirement obligation reports. The "*Internal Code for Self-Insurance of Decommissioning and Closure Liabilities*" was independently verified for its adequacy as a financial assurance. The internal code requires that the audit be conducted in accordance with Section 9100 of the Canadian Institute of Chartered Accountants Handbook). Discussions with TMLSA management and review of correspondence indicates that these reports confirm that the method used for calculating financial assurance reserves was determined to be acceptable. KPMG LLP's professional certification status was confirmed by verification of its membership in the Institute of Chartered Accountants of Ontario; the latter organization is authorized by Canadian statute to act as a regulating body for charter accountancies.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

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

**Standards of Practice**

**6.1 Identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.**

The operation is:            in full compliance  
                                  ■ in substantial compliance  
                                  not in compliance...with Standard of Practice 6.1.

**Describe the basis for the Finding/Deficiencies Identified:**

In addition to many task operating procedures that cover routine work tasks in the CIL, ADR and leach pad process areas [see 4.1 above], TMLSA has the following specific procedures that address safe work practices during cyanide unloading and mixing, cyanide plant operations, and decontamination of cyanide equipment:

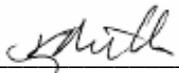
- TAS-CIL-SOP-XXX, CIL Plant Cyanide Mixing
- TAS-ADR-SOP-XXX, ADR Plant Cyanide Mixing
- TAS-CIL-SOP-XXX, CIL Plant Cyanide Handling Procedure
- TAS-TRE-WIN-XXX, Decontamination of Cyanide Facilities
- TAS-TRE-PRO-XXX, Management of Sodium Cyanide Solutions and Slurries Procedure
- WHS-CN-SOP-SOP-000, Supply Chain Cyanide Handling Process

For entry into confined spaces the following procedure is in place to minimize worker exposure: *PTW-FRM-003, Confined Space Entry.*

At the time of the field component of the certification audit TMLSA was in the process of updating and standardizing their operating procedures. As soon as site conditions permit a return to normal staffing and mine operations, TMLSA was requested finalize all written operating procedures associated with cyanide related tasks and complete operator training in these procedures. A site-side retraining program was initiated after the restart and is proceeding systematically as noted in Section 4.1(1).

The use of appropriate PPE is a workplace requirement for all employees and contractors. A hardhat, steel toed boots, reflective vest and safety glasses are required to be worn everywhere at the mine site except for a few designated areas that include the administrative offices and the camp. There is also a requirement for workers to wear additional personal protection such as rubber gloves, coveralls and appropriate respirators when undertaking specific tasks or when working in specific areas where there is a risk of exposure to cyanide. The requirements for PPE are addressed in training programs. Signs are also posted in those areas of the plant where additional PPE is required to be worn. Written procedures detail the particular safety and PPE requirements when undertaking specific tasks. Procedures also detail requirements for carrying portable HCN monitors when conducting certain tasks. The ADR and CIL mix procedures include requirements to complete pre-start checklist prior to undertaking a cyanide mix.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

TMSLA had prepared procedure *TAS-OPS-PRO-00001, Management of Change*, but the procedure had not been fully implemented at the time of audit; an interim Management of Change (MOC) procedure specific to CIL operations was noted to have been drafted by a contractor, but had not been formally issued as a TMSLA procedure. Prior to the submittal date of this SAR, however, *TAS-OPS-PRO-00001* was simplified and issued for use on the TMSLA intranet. Retraining of affected staff began after the resumption of operations in August 2016; see Section 4.1.

TMSLA actively solicits and considers worker input through the Safe Watch program, worker health and safety meetings and tool box meetings. The Safe Watch program involves work safety observations of personnel to evaluate work place risks based on appropriate PPE use, housekeeping, chemical handling, and compliance to procedures and permits. These observations are undertaken by work leads, supervisors, and superintendents at frequencies varying from once a week to quarterly depending on pay grade. The Safe Watch observation checklist includes space for commenting on safe and poor work practices and on actions to be taken to mitigate risk. Safety meetings are conducted once a week. These forums provide workers an opportunity to discuss and provide input on health and safety issues. The meetings include power point presentations on a health and safety topics and open discussion is encouraged. Records of these meetings are maintained that include sign-off sheets of attendees. Tool box meetings are undertaken at the start of each shift and are usually 5 to 10 minutes long. These meetings are used to discuss the work schedule for the shift and safety hazards associated with the proposed work.

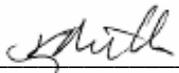
**6.2 Operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.**

The operation is:                      in full compliance  
  ■ in substantial compliance  
  not in compliance...with Standard of Practice 6.2.

*Describe the basis for the Finding/Deficiencies Identified:*

TMSLA has established that process solutions must be maintained at a pH greater than 10 to prevent the generation of HCN and to maximize use of cyanide in the lixiviation process. The TMSLA document entitled "*Reagents*" states that it is absolutely necessary to maintain a high pH to prevent the formation of hydrogen cyanide gas and that in weak cyanide solutions, the pH should be at a minimum of 10.5 and in strong cyanide solutions (such as in cyanide makeup), the pH should be at a minimum of 12.5. In operating procedure "*Preparing a Batch of Sodium Cyanide Solution*" there is a requirement to check that pH is greater than 12.5 before beginning a cyanide mix. Mix procedures for the CIL (*TAS-CIL-SOP-XXX*) and ADR (*TAS-ADR-SOP-X.X.X*) plants also require that the pH is alkaline and the caustic solution pump is operational prior to a mix. Operators monitor the pH in CIL Tanks TK1 (Leach Tank) and TK7 every three hours. There is also a pH meter on Leach Tank TK1 that reports to the control room. Lime is added to Leach Tank TK1 as required to maintain the pH above 10. Review of process plant daily reports show that the operation was maintaining pH between 10.3 and 10.7 in Leach Tank TK1.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

TMLSA has installed fixed HCN Polytron 7000 monitors in areas of the CIL and ADR plants where the potential for HCN gas generation has been determined to be the highest. The fixed HCN meters installed at each of the ball mills were no longer required as cyanide solution is no longer added to the ball mills. The fixed meters will alarm if HCN exceeds 4.7 ppm and a continuous audible alarm if HCN exceeds 10 ppm. In situations where the intermittent 4.7 ppm alarm activates, the supervisor will barricade the area with yellow caution tape and workers will not be allowed to work in the affected area for more than eight consecutive hours. The tag on the yellow caution tape will inform workers to check in with the control room before entering the zone and to check out when leaving the barricaded zone. In situations where the HCN concentration exceeds 10 ppm and the HCN alarm sounds continuously, all workers are required to evacuate the area immediately and go to a place across and upwind of the HCN source. The supervisor will assess the situation and decide if the Cyanide Emergency Response Plan (CN ERP) will be initiated or if the situation can be safely resolved "in house."

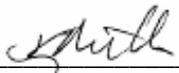
During the site inspection, the audits observed that the two fixed HCN meters located at the ADR mix plant were not positioned to best monitor HCN in the immediate area of the deck where the mix operator works. The auditors recommended that the meters be relocated to more effectively monitor the work area. Subsequent to the field component of the verification audit TMLSA provided photographic evidence showing that the meters had been relocated to better monitor HCN in the operator work area on the upper deck. The wiring on one of the monitors was also observed to be exposed as a result of a broken connector. Photographs were also provided to show that the wiring had been repaired. In addition to the fixed HCN meters TMLSA has recently purchased 20 Draeger portable HCN monitors for use by plant operators. The portable monitors have a beeping alarm at if HCN reaches 5 ppm and a continuous alarm at when HCN reached 10 ppm.

Procedures require that HCN gas concentrations at Leach Tank TK1 and CIL Tank TK6 are monitored each shift. The readings are recorded on the Shift Operator Log and also compared with those reading reporting to the SCADA system from the fixed HCN meters. Procedures also specify which tasks require a portable HCN monitor to be used.

The use of appropriate PPE is a workplace requirement for all employees and contractors. There is a requirement that hardhat, steel toed boots, reflective vests and safety glasses are donned everywhere at the mine site except for a few designated areas that include the administrative offices and the camp. TMLSA has identified those areas and specific tasks where there is a risk of exposure to cyanide. Workers are required to wear additional PPE such as rubber gloves, coveralls and appropriate respirators when working in these areas or undertaking specific tasks where there is a potential for cyanide exposure. The requirements for PPE are addressed in training programs. Signs are posted showing additional PPE requirements in those areas of the plant where additional PPE needs to be worn. Written procedures detail the particular safety and PPE requirements when undertaking specific tasks. Procedures also detail requirements for carrying portable HCN monitors when conducting certain tasks or entering special areas of the site.

TMLSA has a formal annual respirator fit testing and training program which is managed by the H&S Department. The program requires those workers that may need to wear respirators be clean shaven. Those workers who for cultural or religious reasons wish to keep their beards are provided alternative work where the donning of a respirator is not required.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

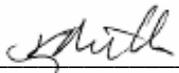
Workers are provided with a Fit Testing Card that details the type of respirator, date of fit testing and the due date for retesting. Discussion with a cyanide mix operator on his use of the full-face respirator and inspection of the respirator cartridges being used revealed that the operator was not aware of the 7 day change out requirements for the chemical cartridge as specified in *TAS-CIL-SOP-XXX, CIL Plant Cyanide Mixing*, or the requirement to date newly fitted cartridges as required. If the cartridges are not changed out on a periodic basis there is a potential for chemical breakthrough rendering the cartridge non-protective. The auditors recommended that the mix procedure be updated to clarify the importance of dating and changing out cartridges and retraining operators in the updated procedure. In addition, the auditors suggested that the cartridges be stored in plastic bags when not in use to restrict the potential adsorbing potential background concentrations of gases that would reduce the life of the cartridge. Subsequent to the field component of the audit TMLSA provided the auditors with copies of the updated procedure, recorded of operator training, and photographs showing the revised respirator storage procedure.

TMLSA recently purchased 20 Draeger portable HCN monitors and were in the process of phasing out older GasAlert monitors. The fixed HCN meters and portable HCN monitors are calibrated as part of TMLSA's preventative maintenance program. The monitors are calibrated on a six-month schedule as recommended by Draeger, the manufacturer. The records are maintained by the H&S Department. Draeger trained 10 people at the site to calibrate these monitors although calibration is predominately undertaken by one person in the H&S Department. The Fire Department also have equipment and gas for calibration of HCN monitors that are dedicated to the department.

Warning signage is prominently posted in areas where cyanide is present. Signage includes cyanide hazard warning signs on security gates/fencing to the ADR plant site, cyanide storage compounds and cyanide waste burn area; on the approach road to the tailings storage facility, and on cyanide mix and storage tanks at the CIL and ADR plants. In addition, "No drinking or eating" signs and signs displaying required PPE are also posted in these areas. Colour coding and labelling is also used on pipelines to identify solutions conveyed in pipelines. However, at the time of the site audit signage was observed to be absent on the tailings line and on newly installed solution pipelines at the Piment and West Branch dump leach facility and ponds. Signage at the burn pit also was severely faded. Subsequent to the field component of the audit TMLSA confirmed that signage had been placed on the newly installed piping and provided photographic evidence of the new signage placed at the ADR. Prior to the submittal of this DAFR, photographic evidence was provided to the audit team verifying that additional cyanide signage had been installed on tailings line at accessible locations near road crossings; on solution pipelines around ponds and solution collection areas at the West Branch; highly visible replacement signage was also installed at the cyanide packaging waste burn pit.

With the exception of the top deck of the CIL above Leach Tank TK1 where cyanide is added to the leach process, safety showers with eyewash stations were observed to be strategically located within easy access around process areas in the event of an emergency. The shower/eyewash stations are inspected each shift to ensure they are accessible and operational. The stations located in the ADR and CIL mix plants are also tested prior to each cyanide mix. Subsequent to the field component of the audit TMLSA installed a

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

shower/eyewash station on the top deck of the CIL above Leach Tank TK1. Photographic evidence was provided to the auditors to show the new installation.

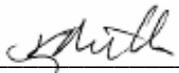
Non-acid powder fire extinguishers are located in strategic locations throughout the process areas. With few exceptions extinguishers were in good condition. Exceptions included a few units in the ADR in which labels and tags were not legible and/or were missing covers and exposed to grime and dust. TMLSA was in the process of installing labels and painting extinguisher stations to aid identification, and is in the process of providing protective covers for all portable extinguishers. Extinguishers are required to be checked for presence and accessibility by operators during daily shift operator inspections, and monthly for charge and condition. Monthly inspection records for 2016 were reviewed. These records were incomplete for the CIL and no records were available for the ADR. Fire extinguishers are maintained on a quarterly schedule by Mauritania Lutte D'incendie, contracted by TMLSA. Subsequent to the field component of the audit TMLSA updated procedure *TAS-ALL-SOP-009 – Fire Extinguisher Inspection* and retrained ADR operators in the procedure. TMLSA provided the auditors with a copy of the updated procedure and photographs showing the newly installed covers for protection of fire extinguishers; copies of training records for the updated fire extinguisher inspection procedures were provided for audit team review prior to the submittal date of this report.

Material Safety Data Sheets (MSDSs) are posted at prominent areas at the CIL and ADR cyanide storage warehouses. MSDS are also located in the CIL control rooms. The MSDS are posted in French and English. MSDS are also accessible on the Kinross intranet site and for employees without ready access to a computer these may be retrieved through a request made to their immediate supervisor.

Accident investigations are controlled primarily through procedure *TAS-HS-PRO-013 "Incident Reporting and Investigation"*. This procedure sets out the process for reporting and investigating all health and safety incidents, including those that involve cyanide. All incidents classified as low to moderate are required to be investigated by supervisor using form *TAS-ALL-HS-FORM-013A "Incident Investigation"*. Significant and High potential incidents are required to be investigated through appointment of an investigation team selected by an investigation team leader and using a Loss Causation technique. The procedure describes the investigation steps involved including: selection of the people and equipment resources needed to gather information; the logistics required for the investigation; inspection of the incident scene; assessment of property and environmental damage; required corrective actions and corrective action plan. The Safety Manager /Officer may facilitate the Loss Causation investigation process. Corrective actions are tracked to completion by the safety department on a corrective action register. The findings, final actions, lessons learnt and effectiveness of actions from investigations are communicated through management meetings, H&S Committee Meetings and toolbox meetings.

TMLSA reported that there have been no cyanide exposure incidents at the site. However, the incident reporting and investigation procedure was used on three occasions (11 November 2015, 26 December, 2015 and 14 January 2016) for potential cyanide related release incidents. On each of these occasions the emergency response team was called out to respond to a report of white powder found inside a shipping container loaded with cyanide was

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

the container was opened. A sample of the powder was collected and analyzed and determined not to be cyanide.

**6.3 Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.**

The operation is: ■ in full compliance  
                          in substantial compliance  
                          not in compliance...with Standard of Practice 6.3.

*Describe the basis for this Finding/Deficiencies Identified:*

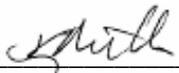
Emergency response equipment and supplies are readily available to respond to cyanide exposure emergencies in the cyanide mix and process areas. Radios and/or telephones are carried by operators to call in emergencies and an alarm system and evacuation procedures are in place. Safety showers with eyewash stations are strategically located around process areas in the event of an emergency. These stations are inspected daily to ensure they are accessible and operational. Oxyviva (medical oxygen and resuscitator) kits are located in the ADR clinic, titration room at the CIL, and at the CIL mix plant. Oxyviva and medical oxygen are also located at the medical clinic, and in the ambulances and ERT fire truck. The clinic has equipment for charging the oxygen bottles and conducts annual maintenance.

The clinic also orders and maintains a supply of cyanide antidote for the site. The antidote used is Cyanokit (hydroxocobalamin). Two Cyanokits are stored in the clinic, one Cyanokit is stored in the ambulance and one Cyanokit is stored in the ADR medical kit.

Shower/eyewash stations are inspected daily by process personnel as part of area inspections. H&S officers also check the operation of these stations during weekly H&S inspections. Shower/eyewash stations are also checked prior to conducting a cyanide mix. Process personnel are also required to check the Oxyviva kits on a monthly schedule. During review of inspection records for 2016, some inspection records for the Oxiviva at the CIL mix plant were missing. Also, no records were available for inspections of the Oxiviva located in the CIL titration room. The monthly inspection program for Oxiviva was therefore in need of review. Subsequent to the field component of the audit TMLSA retrained operators at the CIL plant in conducting monthly Oxyviva inspections. TMLSA provided the auditors with Oxyviva Inspection training records for CIL workers and a completed inspection form for April 2016. The clinic is responsible for maintaining and replenishing the Cyanokits. The expiry date on kits at the clinic and ambulance were October 2016. The expiry date on the Cyanokit at the ADR was April 2017. The clinic conducts monthly inspections of medical equipment and drugs monthly and records were available for review. Cyanokit replacement orders are submitted several months before their expiry date.

TMLSA has implemented a *Cyanide Emergency Response Procedure (CERP)* that is an integral part of the *Tasiast Emergency Response Plan (TERP)* which is the overarching document for emergency preparedness and response at Tasiast. Appendix B of the CERP contains procedure *TAS-HS-HCN-SOP-002 – First Aid Treatment of Cyanide Poisoning*. This procedure describes

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

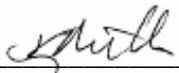
the symptoms of cyanide poisoning, first aid treatment, and roles and responsibilities emergency responders. The procedure also lists the location and quantity of first aid equipment and supplies available at the plants and medical clinic.

TMLSA has an onsite clinic located in the camp compound that is operated under contract by ISOS International. The ISOS contract runs for 4 years and comes up for renewal on 31 December 2017. The clinic is located less than 5 minutes' drive from the CIL process plant and about 15 minutes' drive from the ADR plant and dump leach ponds. The clinic is staffed at all times by a doctor, three nurses and a driver. The clinic always has two doctors on site plus two of either a senior medical officer, paramedic and/or chief medical officer; as well as four nurses, and one head nurse. The clinic is equipped with 3 ambulances, one of which is used as the main medical response vehicle. The clinic is on-call 24/7. The medical personnel at the clinic are the primary responders in the event of a cyanide exposure emergency. Detailed documented cyanide exposure emergency response training materials used to train clinic staff are maintained at the clinic. Because of the distance of the ADR from the clinic a nurse is located at the ADR plant during cyanide mixes. The ERT are also available to conduct medical first aid if required in situations where an exposed person cannot be quickly removed from the designated hot zone during an emergency.

ISOS has provided TMLSA with a letter dated 14 January 2014 regarding treatment of cyanide exposure victims, confirming that ISOS clinic personnel and the Paris ISOS Assistance Centre will render medical care required as per the *Tasiast Medical Emergency Response Plan (MERP)*. In accordance with the MERP patients will be transported to the appropriate clinics with medical escort. In the case of locals the destination would be Clinique Kissi in Nouakchott, Mauritania. In the case of expats, the receiving hospital is Hospital de Gran Canaria in Grand Canary. The ISOS clinic has arrangements to airlift patients to Nouakchott and/or Grand Canary as necessary. ISOS's international connectivity through its Paris office allows it to provide whatever medical expertise and assistance is needed for the patient.

TMLSA periodically conducts mock emergency drills to test the effectiveness of emergency response. A total of four mock drills were undertaken in 2015 and one in 2016 that involved cyanide. These drills included two scenarios (8 March 2015 and 19 April 2015) involving cyanide exposure at the ADR plant, one scenario (11 August 2015) involving cyanide exposure at the CIL plant, one scenario (29 September 2015) involving a solid cyanide spill at the CIL warehouse, and a scenario (8 May 2016) involving a truck carrying a cyanide container. The 8 May 2016 scenario was conducted in association with SOGECO the current cyanide transportation contractor. Each mock drill was documented to record response times and reactions, and a debriefing was conducted following the drill to review positive response actions as well as areas in need of improvement. A corrective action plan was developed and implemented based on lessons learned during the drill. Review of records for each of the mock drills showed evidence of improved response performance over the one-year period.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

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

**Standards of Practice**

**7.1 Prepare detailed emergency response plans for potential cyanide releases.**

The operation is: ■ in full compliance  
in substantial compliance  
not in compliance...with Standard of Practice 7.1.

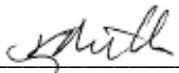
**Describe the basis for the Finding/Deficiencies Identified:**

TMLSA has implemented a *Cyanide Emergency Response Procedure (CERP)* that is an integral part of the *Tasiast Emergency Response Plan (TERP)* which is the overarching document for emergency preparedness and response at Tasiast. The TERP is aligned with the *Kinross Crisis Management Plan (KCMP)* and associated *Kinross Crisis Management System (KCMS)* which is based on the online tool EMQnet. Based on the severity of the emergency the KCMP defines the types of emergency that can be handled by the site crisis management team (SCMT), regional crisis management team (RCMT) and corporate crisis management team (CCMT). The CERP compliments the TERP and KCMP and provides for all staff with respect to emergency response for cyanide related incidents.

The TERP was developed to provide general guidance for preparedness and response to emergency situations including, but not limited to, minor and major injuries, entrapment, minor and major accidents, overtopping/leak/failure of the tailing impoundment, natural disasters, unplanned ignition or explosion, security emergencies, releases/spills of hazardous materials, fires, and natural disasters. These potential emergency situations were identified based on a risk assessment conducted by TMLSA on activities associated with TMLSA's operations at the Tasiast Mine Site, Sondage (water supply area), exploration and project areas within Imkebdene and Tmeimichat, and the access routes between them. The TERP includes procedures for each of the various emergency scenarios that outline roles and responsibilities of the various members of the response team. The CERP provides guidance on additional considerations in the event that the emergency involving cyanide. Cyanide related emergencies have been classified into three categories: Stage 1: Sodium Cyanide – Solids, no water or fire involved; Stage 2: Sodium Cyanide – water, chemicals involved with no fire; and Stage 3: Sodium Cyanide, fire involved. For each category, the CERP provides guidance on ERT requirements, PPE and equipment needs; the appropriateness being determined by the incident commander and available fire personnel.

TMLSA is only responsible for cyanide transport once it has entered the main security gate at the mine site. Nevertheless, TMLSA will provide emergency response assistance to the cyanide transporter if a transportation accident occurs off-site within the region of the mine. The TERP and CERP consider the physical and chemical form of cyanide (solid briquette), road conditions and form of transport (shipping container on truck).

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

On 8 May 2016 TMLSA conducted a mock drill in association with SOGECO the current cyanide transportation contractor than involved a cyanide transport accident outside the secure area of the mine site. The CERP requires that a mock drill is conducted in associated with the transport company at least once annually. Evacuation procedures are provided to all employees, contractors and visitors as a part of site induction training. Evacuation procedures and muster stations are also located throughout the site. Personnel in process areas are trained to evacuate crosswind or upwind of any cyanide release. Windssocks are located at strategic points around the plants to provide guidance of wind direction. The incident commander is responsible for evacuation of residents/personnel of the area surrounding the emergency scene in the event that this becomes necessary. Because the remoteness of the mine site, lack of flowing surface water that would act as a conduit for cyanide migration, absence of potable groundwater, and a sparse population in proximity of the site, it is extremely improbable that an emergency could affect the surrounded land users/community.

**7.2 Involve site personnel and stakeholders in the planning process.**

The operation is: ■ in full compliance  
                          in substantial compliance  
                          not in compliance...with Standard of Practice 7.2.

***Describe the basis for the Finding/Deficiencies Identified:***

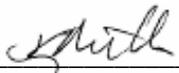
The TERP and CERP were produced through the collaborate effort of the following TMLSA departments:

- Health and Safety for provision of advice on occupational health and safety issues and incident management;
- Environment for provision of advice on environmental impacts and incidents;
- Site Services for provision of information for the Emergency Response Firefighters;
- Security for provision of information on security and incident management, and
- ISOS (Medical Clinic Operator) for provision of health and first aid advice.

There are opportunities for emergency responders to provide input to improve emergency response planning through the post incident and mock exercise critique process.

The mine is located in an isolated dry desert region of western Mauritania where population is low and mostly transient or nomadic, and emergency response capability is subsequently limited. TMLSA has therefore developed internal emergency response capability to handle all probable emergency scenarios associated with the mining operation. Because the mine is located in a remote dry desert region in which the population is low and comprised mostly of transient herders of camels and small ruminants, the only potential risk to communities is from a cyanide release resulting from a transport accident. Nevertheless, TMLSA retained SAHEL Consulting in October 2013 to undertake a cyanide awareness campaign to inform neighbouring communities along the road between Nouakchott and the turn-off to Tasiast about the security measures in the import, transport, storage and use of cyanide in the mine. Meetings were held with authorities and key persons in the Hakem prefect and Department of Chami, and plenary sessions were held with men, women and mixed groups covering 11 communities located along the Nouakchott road and within a radius of 30 km of the mine. These community meetings, together with information disseminated to communities by the

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

local workers employed at the mine, have provided the local community with an awareness of cyanide and the measures to take in the event of a traffic accident and cyanide release.

Because of the isolated location of the mine TMLSA's emergency response capability is all in-house. There are no outside emergency response entities involved in the emergency response plan. In the event that a casualty needs to be transported or airlifted out of mine, these arrangements will be made by the ISOS clinic. ISOS has provided TMLSA with a letter dated 14 January 2014 regarding treatment of cyanide exposure victims, confirming that ISOS clinic personnel and the Paris ISOS Assistance Centre will render medical care required. Arrangements have been made for Nationals to be evacuated to a hospital in Nouakchott and for expats to be airlifted to Grand Canary.

The mine is located in an isolated dry desert region of western Mauritania where population is low and mostly transient or nomadic, and emergency response capability is therefore limited. TMLSA has consequently developed internal emergency response capability to handle all probable emergency scenarios associated with the mining operation. As the mine does not delegate any specific response actions to outside response agencies communication with outside responders is not undertaken or required to keep the Plan current.

**7.3 Designate appropriate personnel and commit necessary equipment and resources for emergency response.**

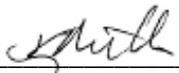
The operation is: ■ in full compliance  
                          in substantial compliance  
                          not in compliance...with Standard of Practice 7.3.

*Describe the basis for the Finding/Deficiencies Identified:*

The roles and responsibilities of emergency response coordinators are set out in the CERP. An Emergency Contact list is included that provides the primary and alternate contacts in the event of an emergency. The Emergency Response Team members are listed in the TERP. The information includes each team members name, job title level and date of training, contact phone number, crew, rotation pattern and shift pattern.

The TERP details required training for emergency response. All staff and long term contractors are required to complete training modules designed to minimize the likelihood of an emergency situation and enable staff to deal with an emergency situation should it occur. All staff that work in areas where there is a potential for contact with cyanide are also required to complete cyanide awareness and annual refresher training. The emergency response team comprises three experienced expat firefighters with each between 8 and 24 years of experience that have been trained according to the South African Emergency Services Institute and International Fire Services Training Association. The remaining ERT members are Mauritanian Nationals with over 1.5 years of experience as ERT members at Tasiast. They are in the process of completing their training which is aligned to South African National Fire Protection Association (NFPA) standards but with a focus on Kinross requirements and site conditions at the Tasiast Mine. TMLSA has contracted with ISOS that provides medical

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

emergency response capability (clinic with doctors, paramedics and nurses) at the site and has made arrangements for emergency medical evacuation as needed.

The TERP details emergency response and communication procedures. All emergencies are called into the Security Operations Centre that is manned 24/7. The Security Operations Centre will coordinate with the ERT and notify other relevant personnel as necessary. The specific duties and responsibilities of the coordinators and team members in cyanide emergencies are described in the CERP. The TERP also links with the KCMP which includes roles and responsibilities of senior management at TMLSA and Kinross Corporate as well as contacts with outside emergency response agencies as required depending on the severity of the emergency as defined in the KCMP. The TEMP includes equipment inventories and checklists for emergency equipment stored on each of the fire hall vehicles, a list of each fire extinguisher and its location, ISOS emergency medical supplies stored at the ADR and Clinic, as well schedules for conducting equipment/supply inspections. The location of Oxiviva are presented in the Cyanide First Aid Procedure that forms part of the CERP.

Because of the isolated location of the mine TMLSA's emergency response capability is all in-house. There are no outside emergency response entities involved in the emergency response plan. In the event that a casualty needs to be transported or airlifted out of mine, these arrangements will be made by the ISOS clinic. Arrangements have been made for nationals to be evacuated to a hospital in Nouakchott and for expatriates to be airlifted to Grand Canary.

**7.4 Develop procedures for internal and external emergency notification and reporting.**

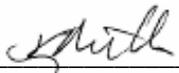
The operation is:  in full compliance  
 in substantial compliance  
 not in compliance...with Standard of Practice 7.4.

***Describe the basis for the Finding/Deficiencies Identified:***

The TERP details emergency response and communication procedures. All emergencies are called into the Security Operations Centre that is manned 24/7. The Security Operations Centre will coordinate with the ERT and notify other relevant personnel and agencies as necessary in alignment with the KCMP. The roles and responsibilities for communication with government agencies, security forces, casualty families and new media, and is set out in the KCMP.

Because the mine is located in a remote dry desert region in which the population is low and comprises mostly of transient herders (of camels and small ruminants) the only potential risk to communities is from a cyanide release resulting from a transport accident. Emergency response and reporting of transport accidents outside of the security gates of the mine would be the responsibility of the cyanide transport company. Nevertheless, TMLSA would provide assistance as required. Incidents that occur on mine property are reported to the on-site Government Representative by the TMLSA Government Relations team. In the event of a significant or prolonged event communication procedures are set out in the TERP and associated KCMP. These procedures include communications through the External Relations Coordinator for coordinating with government agencies and reporting to the media.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

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

The operation is: ■ in full compliance  
                          in substantial compliance  
                          not in compliance...with Standard of Practice 7.5.

*Describe the basis for the Finding/Deficiencies Identified:*

The CERP addresses safe work procedures for handling cyanide spills. Handling procedures include:

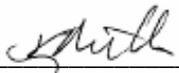
- General procedure for handling cyanide spills
- Handling dry solid cyanide spills inside banded areas
- Handling dry cyanide spills outside a banded area
- Handling liquid or wet cyanide spills outside a banded area
- Handling liquid or wet cyanide spills inside a banded area.

In general, the procedures call for dilution of cyanide with plenty of water within banded areas and pumping back the dilute back into the process. For spills outside of banded areas the procedures call for containing the spill as necessary using earth bunds, neutralizing the spill with dilute sodium hypochlorite and then scooping up contaminated ground and placing it into the process. Procedure *ID291 – Cyanide Decontamination*, provides instruction on preparation of dilute sodium hypochlorite.

The Environmental Department have responsibility for advising and overseeing clean-up/ remediation activities. Procedure *TAS-ENV-WIN-036 – Environmental Soil Sampling Procedure* provides instruction on sampling and analysis, and clean-up criteria requirements to confirm completion of a spill clean-up. Groundwater in the region of the mine site is highly saline and not suitable for potable water supply. The nearest fresh water supply is the Sondage well field located approximately 50 km west of the mine site and there is no known hydrogeological connection between the Sondage supply aquifer and groundwater beneath the mine operation. As the drinking water supply for the mine is bottled water, the provision of an alternative supply is not warranted in the event of a cyanide spill that might impact groundwater underlying the site. There are no surface water bodies in proximity of the site that might be impacted by the use of treatment chemicals for neutralization of cyanide releases.

Procedure *TAS-ENV-WIN-036 – Environmental Soil Sampling Procedure* provides instruction on collecting and analysing soil samples with a particular focus on post incident sampling. The main aim of the sampling program is to confirm that contamination resulting from a spill has been adequately remediated and to advise on further actions. The procedure specifies the type of analyses and selection of clean-up criteria for cyanide spills. For cyanide spills the level of clean-up will be discussed and agreed upon with the government. The procedure describes the method of sample collection as well as sample handling and shipment. Because there are no surface water bodies or water courses in the region of the mine property, procedures for monitoring surface water quality in the event of a spill are not required at Tasiast. The *Environmental Monitoring Plan* includes provisions for updating the

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date



rules for site safety, site security, PPE requirements, emergency response, signage, hazard recognition and alarms. In addition, specific plant area training is required prior for those persons entering the CIL or ADR process areas. Cyanide awareness training is also required prior to persons being permitted to enter areas where cyanide may be present. The site induction training is provided by the Training Department and includes recognition of cyanide; toxicity of cyanide, cyanide exposure pathways; PPE, symptoms of cyanide exposure and poisoning, and emergency response. The training is provided by experienced trainers. Workers that perform cyanide related tasks are also required to complete specific training on operating procedures that relate to specific cyanide management tasks before assumption of duty. The TMLSA training policy was updated in early 2016 to now require that all employees, whether working around cyanide or not, complete cyanide awareness training.

The Training Department currently has four trainers trained by the Training Coordinator. The Training Coordinator is an experienced trainer with a diploma in environmental engineering, bachelor's degree in technical management, a master's degree in communication and diploma in vocational education. He has completed train-the-trainer courses and is an ongoing coach for training and assessment at the Western Sydney Institute, Australia, for the Workplace Assessor – Certification IV certification program for Work Health and Safety BSB41415. The Training Coordinator has designed the induction and safety training materials for TMLSA and is an active trainer.

Cyanide awareness refresher training is required annually. It is usually scheduled when employees return from annual leave or on the anniversary of employment. Every employee carries a HSE Training Passport card "Zcard" that portrays the mandatory training modules or specific training modules for certain work functions. A new "Zcard" is issued annually and is stamped by the training department on completion of each training module. Employees are not permitted to undertake certain job functions or enter certain areas of the site if their training passport is not appropriately stamped to show completion of the required modules. One such module is the cyanide awareness training.

TMLSA retains all training records. Completed cyanide awareness and other mandatory training is tracked on the Kinross Connected – Talent Mine: Learning Management System (LMS) database. Electronic copies are made of the sign-off sheets for each training session and these are also stored in LMS. The original signed copies are retained by the Training Department and filed by training session date. The training records for individuals may be searched by employee ID number and/or date of training.

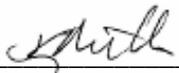
**8.2 Train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.**

- The operation is:
- in full compliance
  - in substantial compliance
  - not in compliance...with Standard of Practice 8.2.

***Describe the basis for the Finding/Deficiencies Identified:***

Task training is undertaken by experienced operators (two shift supervisors and a training process engineer). The training is conducted by a combination of classroom and on the job

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

training. New employees are assigned a "buddy" until they are considered competent to undertake the task unsupervised. TMLSA have developed an operator development plan; an advancement program where, based on experience and competence, the employees may be transferred and trained to work in more technical operations as positions become available. A new unexperienced employee would start as a trainee (pay scale M1) and advance by gaining work experience in the various areas of the operation with opportunities to become a Control Room Operator (M5) and Leading Hand (M6) based on proven ability. This path would take several years of training and on the job experience to achieve.

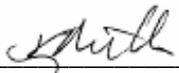
TMLSA recently developed a documented program for tracking task training and, at the time of the onsite component of the audit, was in the process of implementing the program. In addition to mandatory health and safety training which requires annual refresher training, each employee must complete training on specific procedures applicable to his or her job function. Training is tracked by the process training department.

Task specific training is undertaken by the shift supervisors and process training supervisor through training in each element/step of the specific operating procedure. The specific training elements (operating procedures) required for a work area are summarized on the trainer tracking matrix which is maintained by the process training department. Training is currently undertaken through classroom and on the job training. TMLSA is in the process of developing online training modules. At the time of the onsite component of the certification audit task specific SOPs were being updated and rewritten into a standard format and workers were being trained on the new procedures. In addition, on-line training modules were being developed to assist with the task training program. The SOP update and worker retraining program was approximately 60% complete at the time of the audit, and the ongoing training process was interrupted by the site shutdown. As noted previously, mining and mineral processing operations were halted and the site was placed on care and maintenance until the August 2 restart. During most of this period (May 24th - July 26th), virtually all Tasiast employees and contractors were evacuated from the site. After site operations resumed and project staff began to return (and new staff hired), in order to ensure safe operations, TMSLA training protocols required all workers to undergo re-induction and refresher training, including training on the storage, handling, and use of cyanide. Discussions with TMSLA management indicate that from July 27 till mid-December, a total of 3,964 retraining hours were delivered to 774 workers (210 Kinross and 564 contractors). Two iterations of a standard training planning requirements/delivery tracking matrix and examples of training records were also provided as objective evidence that retraining is proceeding in an organized and systematic manner.

Training is provided by shift supervisors and a process training supervisor who are qualified on the basis of experience with the process elements that they are responsible for. Safety training, including cyanide awareness and response, is provided by the TMLSA Training Department.

All employees that work in areas where cyanide may be present are required to complete cyanide awareness training. This training includes recognition of cyanide; toxicity of cyanide, cyanide exposure pathways; PPE, symptoms of cyanide exposure and poisoning, and

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

emergency response. The training is provided by experienced trainers. Workers that perform cyanide related tasks are also required to complete induction training in the areas they work and on operating procedures that relate to specific tasks they undertake in the work place before assumption of duty. The TMLSA training policy was updated in early 2016 to now requires that all employees, whether working around cyanide or not, to complete cyanide awareness training.

The effectiveness of cyanide awareness training is tested through use of written exams. The exam records are maintained by the Training Department. During task training trainees are monitored and not permitted to work alone until the supervisor is confident that the trainee is competent in undertaking his job function.

TMLSA also has a work area observation program known as "Safe Watch" in which supervisors are required to conduct a minimum of eight observations a month. The program focuses on safety in the workplace and includes reporting on work environment, PPE, machinery and equipment, chemical handling, adherence to procedures and permits, and safety. At the time of the field component of the certification audit TMSLA was in the process of implementing a formal task observation program focused on monitoring worker conformance to specific operating procedures. Subsequent to the field component of the audit TMSLA provided evidence including the Task Observation procedure, training records in use of the procedures and sample of a completed task observation to demonstrate that the formal task observation program had been fully implemented.

Training records are retained throughout an individual's employment. Records are in the form of signoff sheets; that include the training topic(s), trainers name and signature; date of training, sign-off by each attendee, and records of the written exam. The course materials are either PowerPoint presentations, as in the case of induction training and cyanide hazard and refresher training, or the actual standard operating procedures in the case of task training. More recently TMLSA has been making electronic copies of training records and posting them in the Kinross Connected – Tasiast Mine LMS. Training is tracked using a training matrix of employee versus training requirements.

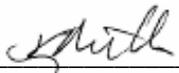
**8.3 Train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.**

**The operation is:**             **in full compliance**  
    **in substantial compliance**  
    **not in compliance...with Standard of Practice 8.3.**

**Describe the basis for the Finding/Deficiencies Identified:**

Cyanide unloading, mixing, production and maintenance personnel are trained in the requirements of operational procedures as well as relevant cyanide management procedures, including emergency response procedures. All employees that work with cyanide complete cyanide awareness training and annual refresher training. The annual refresher training is usually scheduled on return of a worker to site following annual leave. This training includes

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

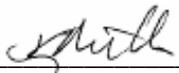
emergency response procedures in the event of a cyanide release. Workers are trained on recognition of the symptoms of cyanide poisoning and the initial first aid measures including decontamination. Process operators participate in mock drills.

All employees that work with cyanide complete cyanide awareness training and annual refresher training. The annual refresher training is usually scheduled on return of a worker to site following annual leave. This training includes emergency response procedures in the event of a cyanide release. Workers are trained to call Channel 1 or telephone 2200911 or 1530 in the event of an emergency and give the location and description of the emergency. Workers are trained to isolate and abandon the area, warn others to do the same and go to the designated muster station in the event of an emergency. They are trained in cyanide exposure recognition and only attempt to provide first aid if safe to do so, otherwise wait for the emergency response assistance. If a HCN alarm is triggered, workers are trained to evacuate the area to the designated muster station. Wind socks are posted to indicate wind direction and workers are trained to evacuation in a cross-wind or upwind direction. Nineteen plant supervisors have been trained in the use of medical oxygen (Oxyviva) and nine in use of Self Contained Breathing Apparatus (SCBA). One or more supervisors will always be on call for first response and, if appropriate, to move an exposed person to a safe area and apply initial first aid while awaiting arrival of ERT and medical clinic personnel.

Members of the dedicated ERT have received ongoing emergency response training since taking their positions on the team about 1.5 years ago. The team were being led and trained by three experienced fire fighters/trainers hired from the UK. However, just prior to the field component of the ICMC verification audit these fire fighters/trainers were replaced by three experienced fire fighters/trainers hired from South Africa. Unfortunately, during this change over most of the ERT training records were misplaced and therefore unavailable for review. Based on discussion with the recently hired Emergency Response Commander, the ERT have received basic fire fighter and hazmat response training and will continue their emergency response training following a program aligned to South African National Fire Protection Association (NFPA) standards but with a focus on Kinross requirements and site conditions at the Tasiast Mine. The roles and responsibilities of emergency coordinators are defined in the TERP and CERP, however, training records for the coordinators were not provided prior to preparation of this draft report. To be fully compliant with this section of the Code, as soon as site conditions permit resumption of operations and appropriate staffing levels, TMLSA needs to provide training records to confirm that the ERT have the minimum training required to competently perform their roles and responsibilities as defined in the TERP and CERP and that coordinators are familiar with the TERP and CERP and are aware of their roles and responsibilities in the plans. Subsequent to the field component of the audit and prior to submission of this report TMLSA provided training records showing that all emergency coordinators and response team members are familiar with the CERP and TERP and are aware of their roles and responsibilities.

Due to the remoteness of the mine the emergency response teams are self-sufficient and have the equipment and personnel needed to address most emergencies at the site. The site maintains seven ERT members plus three expat fire-fighters contracted from Emergency Training Solutions (ETS) Africa. Based on crew rotation there are always four ERT members and two expat fire-fighters on site at all times. The emergency response team is equipped

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

with a Zetros Fire truck, two rescue support vehicles, chemical suits, SCBA, jaws of life and all manner of emergency support equipment, decontamination equipment and PPE to be a self-contained emergency response unit.

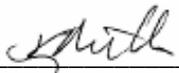
The ISOS staffed clinic is equipped with laboratory, pharmacy, x-ray and three beds for observation. Two doctors plus two of either a senior medical officer, paramedic and/or chief medical officer; as well as five nurses including a head nurse are always onsite. The clinic is equipped with three ambulances, one of which is used as the main medical response vehicle. The clinic is on-call 24/7. The medical personnel at the clinic are the primary responders in the event of a cyanide exposure emergency. The onsite ISOS clinic, together with the ISOS centre in Paris, will render the medical care and accompany patients to hospitals in Nouakchott or Grand Canary if needed. Medical air evacuation arrangements have been made to evacuate patients 24/7.

All employees that work with cyanide complete cyanide awareness training and annual refresher training. The annual refresher training is usually scheduled on return of a worker to site following annual leave. This training includes emergency response procedures in the event of a cyanide release. Workers are trained on recognition of the symptoms of cyanide poisoning and the initial first aid measures including decontamination.

TMLSA also periodically conducts mock emergency drills to test the effectiveness of emergency response. As discussed in Section 6.3 a total of four mock drills were undertaken in 2015 and one in 2016 that involved cyanide. Review of mock drill records indicate that drill responses are evaluated and performance critiqued by the participants and facilitators following the drill. Based on the critique, recommendations for improvement are identified and action items are assigned. Where response skills are found inadequate, further training is recommended. The records of mock drills conducted in 2015 were reviewed. In general there appeared to be a general improvement in response between the first and last drill conducted in 2015, however, although the mock drill records document the persons responsible for addressing a corrective action and a due date was established for completion of the action, no records could be provided to confirm that the actions had been completed. Prior to the submittal of this report, TMLSA updated the procedure as requested, conducted a mock drill using the modified procedure, and provided the audit team objective evidence of completion of post-drill corrective actions as well as records of training for affected staff.

Records of cyanide awareness training and refresher training are maintained by the Training Department. Completion of refresher training is also tracked by the Training Department. Records include the names of the employee, date of training, the name of the trainer, topics covered and exam records to demonstrate an understanding of the training materials. It is understood that the ERT members have been undertaking onsite fire-fighter and emergency response training since August 2015 within a program led by three expat fire-fighters and trainers from the United Kingdom. These expats were substituted in February 2016 by three expat fire-fighters contracted from ETS Africa who have also been tasked with ERT training. At the time of the field component of the certification audit TMLSA could not provide records of training that the ERT had undertaken to date. Subsequent to the field component of the verification audit the CERP was updated to provide clear roles and

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

responsibilities for tracking training and maintaining training records for emergency response training and ERT training.

**9. DIALOGUE Engage in public consultation and disclosure.**

***Standards of Practice***

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

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 9.1.

***Describe the basis for the Finding/Deficiencies Identified:***

TMSLA has established a community/government relations office in Nouakchott in order to provide immediate access to and by regulatory officials and other key project stakeholders. TMSLA's Vice President, Government Relations is based in the Nouakchott office, and is supported by a Director of External Relations at the mine site, as well as internal and regional communications specialists. Regulatory authorities maintain an onsite office located near the mill and CIL area of the mine. Periodic community outreach campaigns have been conducted that involve several small nomadic or seminomadic communities located outside the security perimeter of the concession; comments and questions are routinely solicited as part of these activities. There have been at least two formal cyanide awareness campaigns conducted by the TMSLA community relations department with the assistance of a consultancy (Sahel Consulting); the latest of these campaigns was conducted in October 2013. In addition, TMSLA maintains a French-language Mauritanian website (<http://www.kinross.tasiast.mr>) with a clearly identified contact/inquiry response feature that can be used by any stakeholder with computer access.

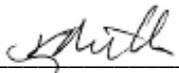
**9.2 Initiate dialogue describing cyanide management procedures and responsively address identified concerns.**

The operation is:                   ■ in full compliance  
  in substantial compliance  
  not in compliance...with Standard of Practice 9.2.

***Describe the basis for the Finding/Deficiencies Identified:***

In keeping with Kinross corporate policy, TMSLA evaluates requests for information or potential grievances related to the use of cyanide or any other mining issue on a case-by-case basis. This practice applies whether or a comment or questions is received in a public meeting or other written or verbal communication. Although as noted in Section 5 of this SAR TMSLA are in ongoing negotiations with the government over plans to close TSF-1 and -2, both of

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date

which have historical residual cyanide contamination issues that must be addressed as part of the closure design, TMSLA management confirms that there have been no specific complaints over the ongoing use of cyanide *per se* in currently active parts of the mineral separation process. Per the CERP, TMSLA policy also requires reporting of all cyanide incidents, regardless of the amount or concentration of cyanide involved, which provides prompts that the government may use to make further enquiries or require other action; see section 9.3(3) below.

There have been at least two formal cyanide awareness campaigns conducted by the TMSLA community relations department with the assistance of a consultancy (Sahel Consulting); the latest of these campaigns was conducted in October 2013. These campaigns provided the opportunity to directly interact with stakeholders and address their questions and concerns. TMSLA also maintains a French-language Mauritanian website ([http://www.kinross\\_tasiast.mr](http://www.kinross_tasiast.mr)) that provides general information about the mine, including clearly rendered, well-explained schematic representations of the use of cyanide in mineral processing, as well as Kinross and TMSLA commitments to the ICMC. Other general discussions of cyanide use are also provided in the Corporate Social Responsibility (CSR) reports posted on the Kinross corporate website (see <http://www.kinross.com/corporate-responsibility/default.aspx> ).

### **9.3 Make appropriate operational and environmental information regarding cyanide available to stakeholders.**

The operation is:   ■ in full compliance  
                          in substantial compliance  
                          not in compliance...with Standard of Practice 9.3.

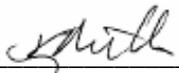
*Describe the basis for the Finding/Deficiencies Identified:*

TMSLA also maintains a French-language Mauritanian website that provides a clearly rendered, well-explained schematic representations of the use of cyanide in mineral processing, along with associated written text. Similar materials are included in PowerPoint-based and other written presentations used in outreach discussions held in Nouakchott as well as several small communities near the security perimeter of the site. Other general written discussions of cyanide use are also provided in the Corporate Social Responsibility (CSR) reports that may be accessed via the Kinross corporate website.

Literacy issues are sometimes encountered in public outreach efforts, hence verbal presentations and open discussion sessions are emphasized over the dissemination of written materials. Outreach meetings are reportedly conducted in French and the local Berber dialect in order to ensure broad understanding of the information provided.

There have been at least two formal cyanide awareness campaigns conducted by the TMSLA community relations department with the assistance of a consultancy (Sahel Consulting); the latest of these campaigns was conducted in October 2013. Video presentations were made as part of this effort, which also provided the opportunity for the operation to directly interact with stakeholders and verbally address their questions and concerns.

Tasiast  
Name of Mine

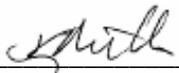
  
Signature of Lead Auditor

January 3, 2017  
Date

Per Section 6.3 of the CERP, TMSLA policy is to immediately report all cyanide incidents to the onsite government representative, regardless of quantity or concentration of cyanide involved. Any such incidents are also routinely documented in quarterly environmental reports. The External Relations Department in Nouakchott is responsible for presenting the latter to the Ministry of Petroleum, Energy and Mines; Ministry of Environment and Sustainable Development; and Director of Operations Monitoring and Control, for their review and potential further investigation or action. Summaries of any such incidents would also typically be made public as part of corporate CSR reports, which are openly accessible through the Kinross corporate website.

Discussions with TMSLA management indicate that no offsite releases have occurred in the life of the mine, nor would such releases even be physically possible given the lack of surface water features, the mine's remote location, and the central location of all cyanide facilities and process areas within the boundaries of the concession. However, as a matter of policy TMSLA reports all cyanide incidents.

Tasiast  
Name of Mine

  
Signature of Lead Auditor

January 3, 2017  
Date