

ICMI International Cyanide Management Code

Summary Audit Report

Kumtor Gold Company

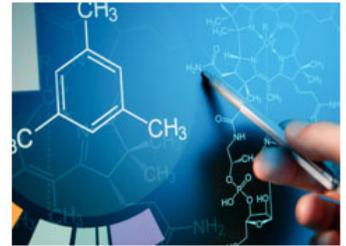
Cyanide Transportation Operation

2018 Re-Certification Audit

centerraGOLD



KUMTOR
KYMTOP



Submitted to:
The International Cyanide Management Institute
1400 I Street, NW – Suite 550
Washington, DC 20005
USA



Kumtor Gold Company

Company Names & Contact Information

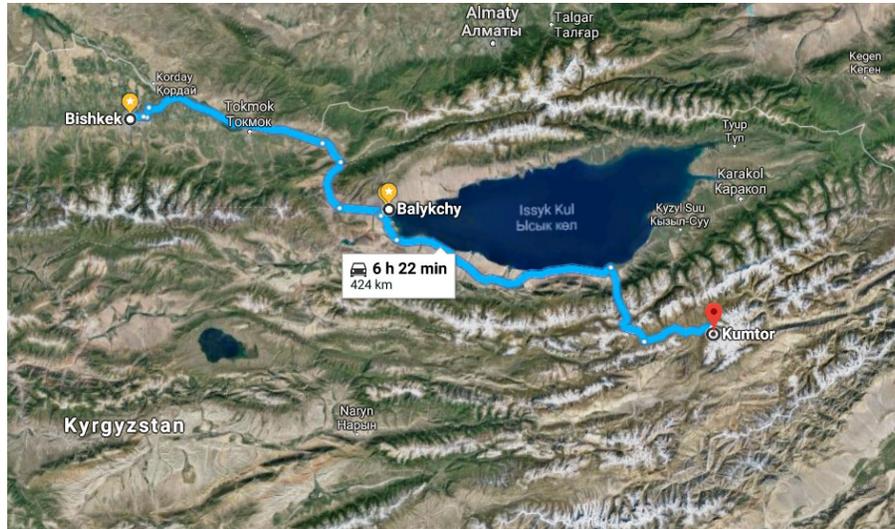
Name and address of Headquarters:	Kumtor Gold Company 24 Ibraimov Street Bishkek, Kyrgyzstan (HQ) and Balykchy Marshalling Yard (BMY)
Name and contact information for Kumtor Gold Company:	Daniel Desjardins, President 24 Ibraimov Street Bishkek, Kyrgyzstan (HQ) Tel. 996-312-90-07-07 Fax. 996-312-59-15-26 daniel_desjardins@Kumtor.com

Operational Overview

The Kumtor Gold Company (KGC) is a subsidiary of Centerra Gold Inc. and owner of the Kumtor Gold Mine in Kyrgyzstan. KGC headquarters are in the capital of Kyrgyzstan, Bishkek. The gold mine has been in operation since 1996 and the Balykchy Marshalling Yard (BMY) facility has been in its current location since 2011. The scope of this ICMC certification audit was the transport of solid sodium cyanide from the KGC interim storage facility in Balykchy, Kyrgyzstan to the Kumtor Gold Mine.

KGC purchases solid sodium cyanide from International Cyanide Management Code (ICMC) certified cyanide producers. The cyanide producers are responsible for transporting the cyanide to the KGC Balykchy Marshalling Yard (BMY). The cyanide is packaged in 350 kg Intermediate Bulk Containers (IBCs) by the Producer and is delivered to KGC in 20-foot intermodal transportation containers. The cargo is blocked, braced, and sealed by the producer and is not opened until it arrives at the Kumtor Gold Mine. One change from the previous 2015 certification cycle is that the cyanide is now only received by truck rather than by truck and rail. The operation, nonetheless, maintains the capability to receive materials by rail.

The KGC Balykchy Marshalling Yard (BMY) is approximately 140 km East-Southeast of Bishkek (reference area map on following page). The cyanide transportation route from BMY to the mine is approximately 250 km long, the first 150 km of which are on public roads.



The mining operation is located on the northwest slope of the Ak-Shyirak mountain range of the Tian-Shan Mountains in northeast Kyrgyzstan. The mine is at an altitude of approximately 4,000 meters above sea level. The weather on the road to the mine is severe due to the altitude and cold weather hazards. There are risks of avalanche, year-round snow, and an average yearly temperature of -8 degrees Celsius.

Audit Implementation

This on-site audit was conducted in accordance with the International Cyanide Management Institute (ICMI) ICMC certification requirements using the ICMC Transportation Protocol. The audit was performed by an independent third-party auditor who is pre-approved by the ICMI as a Lead Auditor for Gold Mining, Transportation, and Production ICMC audits and as a Technical Expert for ICMC audits of cyanide transportation and production operations.

The audit was conducted at the Balykchy Marshalling Yard (BMY) and at the Kumtor Gold Company Headquarters.

Interviews were conducted with KGC Management, Staff, Convoy Leaders, Drivers, Trainers, Emergency Responders, Security, and Medical Personnel. Policies and procedures were reviewed, and records were evaluated.

Cyanide interim storage conditions, loading operations, convoy preparation, training, dispatch, and shipment tracking were all evaluated during the audit. Equipment used for the loading and transport of the cyanide shipment that took place during the audit was evaluated. Extensive shipment, training, maintenance, inspection, and supply chain-related records from the re-certification period (2015-2018) were reviewed.

Auditor's Finding and Attestation

Cyanide management practices for the Kumtor Gold Company (KGC) cyanide transportation operation were evaluated for ICMC compliance using the *ICMI Transportation Protocol*. KGC internal policies, standards, and procedures, regarding the management of the Cyanide Transportation were reviewed. Records from the re-certification period (2015-2018) were also evaluated and found to be very complete and well organized. Safety culture was very strong among all those interviewed during the audit, and awareness of roles, responsibilities, and safety requirements was excellent.

KGC did not have any cyanide-related spill or exposure events during the re-certification period.

The audit was conducted through discussions and interviews with Kumtor personnel. Equipment was physically evaluated. Records regarding shipment tracking, security measures, shipping documentation, community involvement, operational procedures, training, maintenance, and emergency response records were randomly sampled during the audit and were also found to be acceptable. All personnel were very well prepared for the audit. The auditor found that the overall level of preparedness and understanding of ICMC requirements was excellent.

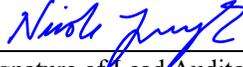
The Kumtor Gold Company sodium cyanide transportation operations were found to be in FULL COMPLIANCE with the ICMI International Cyanide Management Code requirements.

Audit Company:	MSS Code Certification Service www.mss-team.com
Lead / Technical Auditor:	Nicole Jurczyk E-mail: CodeAudits@mss-team.com
Date(s) of Audit:	August 6-8, 2018

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Certification 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 Certification Auditors.

I attest that the Audit Reports accurately describe the findings of the re-certification audit. I further attest that the re-certification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Transportation Operations and using standard and accepted practices for health, safety and environmental audits.

Kumtor Gold Company		September 12, 2018
Name of Operation	Signature of Lead Auditor	Date

Kumtor Gold Company – Transport		September 12, 2018
MSS Lead Auditor: Nicole Jurczyk	Signature of Lead Auditor	Date

Audit Results - Cyanide Transportation Verification Protocol

1. TRANSPORT: Transport cyanide in a manner that minimizes the potential for accidents and releases.

Transport Practice 1.1: Select cyanide transport routes to minimize the potential for accidents and releases.

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.1
 not in compliance with

Summarize the basis for this Finding:

KGC has implemented extensive processes to evaluate the transport route prior to every convoy deployment to minimize the potential for accidents and releases. KGC takes the necessary measures to manage the risks identified on the route that is available for transport to the Kumtor Gold Mine.

The documented route evaluation procedure considers population density, infrastructure, pitch & grade, proximity to water bodies, and the prevalence and/or likelihood of poor weather that could result in poor driving conditions. Special consideration is given to the potential for avalanches. An evaluation is done prior to each convoy deployment and trucks are only dispatched if the team of experts have a very high level of confidence that the cargo can be delivered safely.

The risks for the route have been identified and extensive risk mitigation measures are in place. Risks include poor weather, tourists, animals on the road, dangerous turns or passes, driver fatigue and avalanches. Another risk of this transportation route is that there is little to no assistance available to help with problems along the route. Convoys with police escorts are used to make sure that there are always sufficient resources and personnel with the shipment to manage any unforeseen problems.

The risks associated with having a truck breakdown during the journey are mitigated through the dispatch of a “spare” truck. The trailer can be hooked up to the extra tractor if necessary. Police escort the convoy to manage traffic situations and provide additional security. Two pickup trucks with emergency response equipment are also part of the convoy. The Convoy Leaders are specially qualified and authorized to act in the capacity of Convoy Leader. The Convoy Leader of the one convoy observed was interviewed and was found to be highly skilled and competent for the role.

The route is evaluated before each convoy is deployed. The mine provides BMY with a daily report regarding weather and road conditions. The Convoy Leader has direct contact with the Dispatcher regarding road and driving conditions. Driver feedback is integrated into the review process before the convoy leaves. The route review / training meeting prior to the convoy was observed during the audit. Information was comprehensive and BMY Management and Staff were all in attendance (in addition to the Convoy members). There was an excellent level of “Demonstrated” Leadership regarding safety. Drivers responded well to questions about safety the task at hand. Drivers are encouraged to bring feedback regarding operations and the route to leadership at any time. This information was confirmed through interviews with KGC personnel, including Drivers.

The measures to be taken to address identified risks are clearly documented in the Transportation Permit that is brought by the Drivers on the convoy. Authorities issue the detailed route permit in accordance with Decree No. 198 (Regulations on Dangerous Goods Transportation by Motor Vehicles), dated April 11, 2016. Both the regulation and the transportation permit issued for this specific route are extremely detailed. The permit for the safe transport of sodium cyanide (NaCN) from BMY to the Kumtor mine by motor vehicles was issued in 2016 and is valid for three years. It was issued and signed by the following authorities:

- Road Patrol Service of the Kyrgyz Republic
- State Committee of the Industry, Energy, & Subsoil Use from the Kyrgyzstan Republic (KR) Government
- Kyrgyzstan Republic Health Ministry
- State Agency for Environmental Protection
- Forestry
- Ministry of Emergency Situations

Risk mitigation actions were found to be appropriate for the route driven.

The route is officially approved by the Police every May and November. The most recent approval was made on May 10, 2018. Records were reviewed and showed that there is extensive communication and outreach with communities through which the convoys pass.

The convoy is constructed in such a way that it is self-sufficient. Police, Emergency Responders, Kumtor Security, Medical Doctor, and mechanics are part of the convoy so that any potential problem can be readily addressed. KGC was able to demonstrate through records that extensive outreach and emergency response planning has been done both internally and externally with authorities, medical facilities, and communities.

KGC does not subcontract any portion of their cyanide transportation operation.

Transport Practice 1.2: Ensure that personnel operating cyanide handling and transport equipment can perform their jobs with minimum risk to communities and the environment.

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.2
 not in compliance with

Summarize the basis for this Finding:

KGC only employs drivers who are licensed, trained and qualified. Records were readily available and were found to be complete for all cyanide drivers. All Drivers and equipment operators have Class D driver's licenses, mine driver licenses, Transportation of Dangerous Goods certificate, and permits for driving the tractor and trailer. Medical exams are carried out regularly and a medical check is performed prior to the dispatch of each convoy.

All personnel operating cyanide handling and transport equipment have been trained to perform their jobs in a manner that minimizes the potential for cyanide releases and exposures. Training records were reviewed for the re-certification period and were found to be complete. Refresher training is given to Drivers each time directly before the dispatch of the convoy.

Transport Practice 1.3: Ensure that transport equipment is suitable for the cyanide shipment.

Transport Practice 1.3: Ensure that transport equipment is suitable for the cyanide shipment.

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.3
 not in compliance with

Summarize the basis for this Finding:

KGC only uses equipment designed and maintained to operate within the loads it will be handling. KGC tractors and trailers were sampled and confirmed to have weight capability that well exceeds the weights that are being loaded. Drivers must use a third-party certified scale checking axle and gross weights. Confirmation is made that the axle and gross weights are compliant with requirements and that the equipment can transport the loads prior to being cleared for dispatch. Shipping records and truck scale tickets were sampled from the re-certification period. Record retention and retrievability was excellent. Records showed that truck weights and axle weights were compliant with requirements.

High capacity container moving equipment was in use at the time of the audit. The weight capacity of the equipment in use for all cyanide-related applications at BMY well exceeded the weights of the intermodal containers.

Truck inspections and preventive maintenance actions are performed regularly to ensure that the equipment is safe to operate and that it can continue to carry the loads for which is it designated. BMY maintains defined checklists showing that all necessary maintenance activities are used. Records were available to demonstrate that tractors are checked before every transport.

Drivers must use a third-party certified scale checking axle and gross weights. Confirmation is made that the axle and gross weights are compliant with requirements and that the equipment can transport the loads prior to being cleared for dispatch. Shipping records and truck scale tickets were sampled from the re-certification period. Record retention and retrievability was excellent.

Records were available for review during the audit and confirmation was made that loads have not exceeded regulatory weight limitations or equipment loading capacities. The loads being hauled are standard loads that do not vary greatly in weight. Records were checked against weight capacities and weight limit regulatory information.

Transport Practice 1.4: Develop and implement a safety program for transport of cyanide.

The operation is in full compliance with in substantial compliance with not in compliance with Transport Practice 1.4

Summarize the basis for this Finding:

The cyanide packed into Intermediate Bulk Containers (IBCs) is delivered to KGC in 20-foot intermodal transportation containers. The cargo is blocked, braced, and sealed by the producer and is not opened until it arrives at the Kumtor Gold Mine. The intermodal containers are not opened by KGC transportation personnel. The intermodal containers are only opened by mine personnel after they have arrived at the mine.

Defined processes are in place for securing the intermodal containers to the chassis. Observations were made of the personnel who bolted the containers onto the chassis following the placement of the container on the chassis.

Appropriate placards showing UN 1689 (solid sodium cyanide) are displayed on all four sides of the transport vehicles. The trucks dispatched during the audit were observed as having appropriate placarding. Drivers visually inspect the trailers prior to each transport. This was observed and confirmed through interviews with drivers. Equipment markings were found to

be adequate and conformant to requirements detailed in the transportation regulation and the transportation permit for this route.

Drivers and mechanics conduct a pre-trip inspections prior to departure and a post-trip inspection upon return to the yard. Mechanical defects are called to the attention of the on-site mechanic. Issues that would affect safety and/or legal compliance are resolved prior to the next transport. Records showing that pre-trip inspections are performed were reviewed and found to be acceptable.

KGC maintains a formal preventive maintenance program for all equipment as part of its formal management system. Records were complete and demonstrated that planned maintenance activities are occurring as scheduled. The government Transportation Permit only allows driving during daylight. The journey to the mine is eight hours. There is no opportunity to exceed the governmental limit of ten hours.

Each shipment is bolted down, then straps are applied to ensure that the shipment does not shift. This practice was observed during the audit and was found to be acceptable. Each driver is empowered to tell the Convoy Leader that he is too tired to continue driving or if another reason for stopping the convoy occurs. The Convoy Leader has complete authority to stop the shipment for any unsafe reason.

KGC has an alcohol testing program. Testing is done before any convoy departs. This is part of the general medical check prior to dispatch. This practice was observed and was found to be acceptable. Interviews were held with the Nurse regarding “what if” scenarios. Awareness of the importance of this pre-trip medical check was very high. The KGC managing system is very mature and it has extensive documentation, inspections, and record-keeping requirements. The KGC strong safety culture was evident.

Transport Practice 1.5: Follow international standards for transportation of cyanide by sea and air.

The operation is in full compliance with in substantial compliance with not in compliance with Transport Practice 1.5

Summarize the basis for this Finding:

KGC does not ship cyanide by sea or by air.

Transport Practice 1.6: Track cyanide shipments to prevent losses during transport.

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.6
 not in compliance with

Summarize the basis for this Finding:

KGC uses Global Positioning System (GPS) tracking on all its transport vehicles. Each vehicle also has a radio and a camera. This system is provided by Incomtek. Additionally, the Convoy Leader has a satellite phone. The drivers are in regular contact with each other and the Convoy Leader is in regular contact with the yard and the mine. The functionality of the communication equipment is confirmed during the pre-trip inspections. This was found to be acceptable by the auditor. The radios and satellite phones are also checked regularly by the maintenance department.

There are no black-out areas along the route. This was confirmed by an evaluation of the GPS system. Additionally, the Convoy Leader has a satellite phone. Compliance with speed and time of day restrictions were confirmed for a sample of shipments made during the re-certification period. Real-time data tracking was done, and interviews conducted during the audit to confirm tracking capability. Capability and adherence to requirements was found to be excellent.

The primary chain of custody documentation used by the operation is the way bill. This document shows the gross, tare, and net weights of the shipment. The weight of the product is clearly noted, as is the type of packaging. Records for the re-certification period were readily available for review. They were found to be complete and very well organized. Safety Data Sheets are sent with each convoy. Each driver has an emergency information card. Drivers were interviewed and paperwork in trucks was inspected to confirm the practice.

2. INTERIM STORAGE: Design, construct and operate cyanide trans-shipping depots and interim storage sites to prevent releases and exposures.

Transport Practice 2.1: Store cyanide in a manner that minimizes the potential for accidental releases.

The operation is in full compliance with
 in substantial compliance with Transport Practice 2.1
 not in compliance with

Summarize the basis for this Finding:

Warning signs prohibiting smoking, open flames, eating or drinking are on every door. Personal Protective Equipment (PPE) requirements are noted. Only authorized people have access to the warehouse. The warehouse is kept locked. The warehouse was evaluated during the audit and the Warehouse Supervisor was interviewed. The storage of cyanide is taken very seriously and is managed in a very tightly controlled manner. No other chemicals are stored in the warehouse.

The cyanide is stored inside a warehouse with walls and a roof. There is little to no potential for the intermodal containers to become wet while in storage. The cyanide inside the containers is further sealed in IBCs. The intermodal containers are not opened at BMY. They are only opened after they are delivered to the mine.

The warehouse ventilation is turned on before anyone enters the warehouse. The air in the warehouse is then checked with an air analyzer prior to entry, each time. Additionally, the number of cyanide containers stored in the warehouse was very small. The warehouse structure itself was at least 10 meters high. The area was found to be suitable.

The facility only stores dry sodium. It is stored on a concrete floor. The cyanide inside the containers is further sealed in IBCs. The intermodal containers are not opened at BMY. They are only opened after they are delivered to the mine. The facility was found to be acceptable.

3. EMERGENCY RESPONSE: Protect communities and the environment through the development of emergency response strategies and capabilities.

Transport Practice 3.1: Prepare detailed emergency response plans for potential cyanide releases.

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.1
 not in compliance with

Summarize the basis for this Finding:

KGC maintains a formal Emergency Response Plan (ERP) and several related emergency response procedures for specific types of emergencies such as a potential cyanide exposure and spill. The most recent plan is dated May 2018. The plan is reviewed at least annually by the Safety Coordinator and the BMY Manager.

The ERP covers both storage at the yard and the transport system. The ERP and emergency procedures addressed all relevant potential emergencies at BMY and during transport. The ERP covers solid cyanide. This is the only form of cyanide present. The only mode of transportation is truck loaded with intermodal containers with intermediate bulk containers inside. The ERP was found to be suitable for the method of transportation and the storage at BMY. The different road types such as public, private, and rugged mine site were considered.

The ERP and the emergency procedures include description of response actions if there is an emergency. The roles and responsibilities of the Convoy Leader, Police, Driver, BMY personnel, and mine personnel are described in the emergency procedures. There is a detailed table at the back of the ERP that lists many pages of scenarios and potential emergencies and the very tactical actions that are to be taken. The order in which response steps are to be taken are listed and the responsibilities for each action are also included.

The ERP and the emergency procedures identify the roles of internal responders and the role of the Police who are with each Convoy. The interactions with the medical facilities are managed by the Doctor and Nurse. There is a Doctor sent with each Convoy and there is a Nurse who is either at the site or on call in case there is a problem. The Doctors have close ties with the hospital and would facilitate the treatment of any cyanide exposure victims in the event of a release.

Transport Practice 3.2: Designate appropriate response personnel and commit necessary resources for emergency response.

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.2
 not in compliance with

Summarize the basis for this Finding:

Training on the emergency response plan is given annually. Records from the re-certification period were available and reviewed. Drills are conducted regularly, and they are also used from a training perspective to keep responders up-to-date with their skills. Personnel were interviewed, and awareness of emergency procedures and reference documentation was confirmed.

The ERP and the emergency procedures include description of response actions, roles, and responsibilities if there is an emergency. KGC maintains three separate lists of emergency response equipment: an ERT truck list, a convoy list and a BMY list. Equipment on the convoy trucks, in the BMY emergency truck, and in the emergency equipment storage room was reviewed against the lists. Inspection sheets were available for all the equipment and demonstrated that there is an organized approach to checking equipment at regular intervals.

Pre-trip checklists, auditor observations of the large amount of emergency equipment on the convoy pickup trucks, and personnel interviews were used to confirm that the emergency equipment and PPE requirements of the ERP are being followed.

The pre-trip inspection process includes a confirmation that the emergency equipment and PPE are in the truck. Emergency response equipment kept at the yard is inspected each week. Records of the inspections were reviewed and found to be complete.

Transport Practice 3.3: Develop procedures for internal and external emergency notification and reporting.

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.3
 not in compliance with

Summarize the basis for this Finding:

Notification procedures are described in detail within the ERP. Confirmation was made that telephone numbers and instructions are in place for the notification of BMY, the mine, KGC personnel in Biskek (as necessary), authorities, response providers, medical facilities, and potentially affected communities.

KGC maintains emergency response procedures. The most recent plan is dated May 2018. The plan is reviewed at least annually by the Safety Coordinator and the BMY Manager. Telephone numbers are checked during the annual review.

Transport Practice 3.4: Develop procedures for remediation of releases that recognize the additional hazards of cyanide treatment chemicals.

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.4
 not in compliance with

Summarize the basis for this Finding:

KGC maintains a formal Emergency Response Plan (ERP) and several related emergency response procedures for specific types of emergencies such as a potential cyanide exposure and spill. The most recent plan is dated May 2018. The spill procedures address the potential need to respond to a cyanide spill and the neutralization procedures required. Interviews confirmed that if there were ever a spill of cyanide that the cleaned-up materials would need to be brought to the mine and/or a hazardous waste disposal company for proper disposal.

The ERP addresses the requirement that none of the chemicals such as sodium hypochlorite, ferrous sulfate, or hydrogen peroxide be used to treat a release to surface water. Awareness of this issue was very good.

Transport Practice 3.5: Periodically evaluate response procedures and capabilities and revise them as needed.

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.5
 not in compliance with

Summarize the basis for this Finding:

The Emergency Response Plan (ERP) is reviewed, and updated if needed, annually. The telephone numbers on the call list were reviewed and checked for accuracy annually. At least two drills are conducted each year to train emergency responders and keep emergency response capabilities up-to-date. Drills included the testing of both cyanide storage at BMY and transportation-related scenarios. Extensive drill critique records were available for the re-certification period.

The KGC Emergency Response Plan calls for a review of performance after actual emergencies and after a drill. Changes are to be made to the plan, as needed. Drill critique records were available for review and found to be complete. Improvements deemed necessary following the drills were tracked to closure.