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REPORT

ICMC Recertification Summary Audit Report

Wharf Mine, South Dakota, USA

Submitted to:

International Cyanide Management Institute (ICMI)

1400 I Street, NW - Suite 550
Washington, DC 20005
United States of America

Submitted by:

Golder Associates USA Inc.
7245 W Alaska Drive, Suite 200, Lakewood, Colorado, USA 80226

+1 303 980-0540

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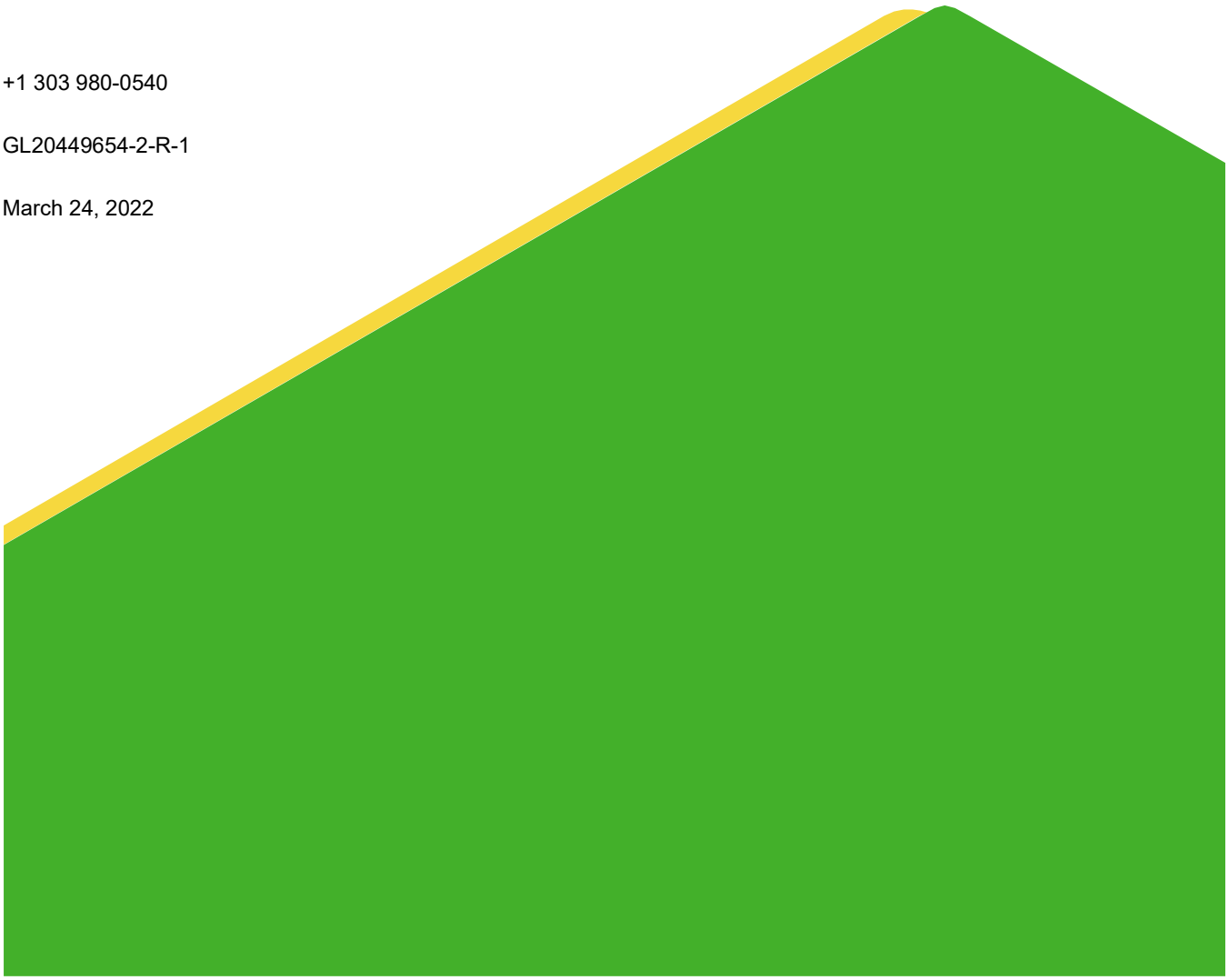

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1.0 SUMMARY AUDIT REPORT FOR GOLD AND SILVER MINING OPERATIONS

Name of Mine:	Wharf Mine
Name of Mine Owner	Coeur Mining, Inc.
Name of Operator:	Wharf Resources (USA), Inc.
Name of Responsible Manager:	Mr. Ken Nelson, Mine General Manager
Address:	Wharf Resources (USA), Inc 10928 Wharf Road Lead, South Dakota 57754
State/Province:	South Dakota
Country:	United States
Telephone:	+1 605-584-1441
E-Mail:	knelson@coeur.com

2.0 LOCATION DETAIL AND DESCRIPTION OF OPERATION

2.1 Mine Location

The Wharf Mine (Wharf) located in the Northern Black Hills of South Dakota; approximately five miles west of the town of Lead in Lawrence County, USA (Figure 1).

Figure 1: Regional Location Map

2.2 Background

As described in the March 11, 2019, detailed audit findings report (the 2019 recertification audit report) prepared by Visus Consulting Group, the Wharf mine is an open-pit, heap leach, gold operation. Coeur Mining, Inc. (Coeur) acquired Wharf from Goldcorp Inc. in February 2015. Wharf Resources (USA), Inc., a subsidiary of Coeur, is the operator of Wharf, which has been under Coeur management over this entire International Cyanide Management Code (ICMC or the Code) audit cycle. The property consists of several areas of adjoining gold mineralization, mined as a series of open pits.

Haul trucks transport run-of-mine ore to the crushing plant where a three-stage crushing circuit reduces the ore to a nominal size of 80%) minus ¾-inch diameter. Granulated lime, added to the ore during crushing, provides control of the pH in the leach solution during processing.

Haul trucks transport crushed ore to one of five on/off heap leach pads for placement in 20-foot high lifts to a maximum height of 150 feet over the pad liner. The five leach pads used for ore processing cover approximately 70 acres with a capacity of nine million tons. The pad design includes double synthetic liners on top of an eight-inch-thick layer of compacted clay, with a leak detection, collection, and recovery system (LDCRS) located between the two synthetic liners. Drip emitters placed on the top of each lift and wobbler-type or Rain Bird®-type

sprinklers on the side slopes distribute a dilute, alkaline sodium cyanide solution (i.e., barren process solution) through the crushed ore. Buried drip lines are the primary solution distribution method, which mitigate potential freezing, reduce evaporation, and minimize ponding. As the solution percolates down through the ore, gold leaches from the ore into solution and the gold bearing (pregnant) process solution gravity flows through pipelines to the Adsorption, Desorption and Refining (ADR) plant (Process Plant). The leaching process is usually complete (i.e., full economic recovery of gold from the ore) within approximately 12 to 18 months after the leach pad is completely loaded with ore.

Following completion of active leaching, the pad enters the neutralization/denitrification stage. Pad neutralization utilizes hydrogen peroxide to destroy the sodium cyanide in the pad effluent to target levels required for denitrification plant influent, which is weak acid dissociable (WAD) cyanide concentrations below 0.5 milligrams per liter (mg/L).

Wharf then utilizes a carbon-in-column (CIC) circuit at the Process Plant to remove metals from the pad effluent to meet surface water quality for discharge. From the CIC circuit, the solution reports to the denitrification circuit for nitrate destruction, comprised of two biological denitrification plants and a heated pond, which acts as a biological reaction cell. The biological denitrification process utilizes bacteria to remove the oxygen from the nitrates and nitrites, chemically reducing them to inert nitrogen gas. Upon completion of nitrate destruction in the solution stream, solution reports back to the leach pads through the same piping network used to convey the original barren process solution. The five-pad system allows the availability of one pad (at minimum) for each phase of the processing cycle at any given time.

Denitrification continues until the spent ore meets the criteria for off-loading. The State of South Dakota and Wharf both sample the pad effluent solution and verify the results through third party analysis. The spent ore is trucked to an approved spent ore storage area (i.e., the mine pits) when approved for removal from the leach pad, which includes WAD cyanide concentrations below 0.5 mg/L in the draindown solution.

Pregnant Leach Solution (PLS), collected in the dams at each leach pad, reports to the PLS Sump located at the Process Plant. From the PLS Sump, the solution reports to the adsorption circuit, which consists of four separate CIC trains (three when neutralization is ongoing) containing activated coconut shell carbon to remove the dissolved metals (primarily gold and silver) from the PLS. Once the metals adsorb onto the carbon, the “loaded” carbon is transferred to the elution circuit where gold and silver are stripped from the loaded carbon using a modified Zadra process. Stripped carbon is then acid washed utilizing concentrated acetic acid, pH adjusted with caustic, reactivated at 1,300 degrees Fahrenheit, and then returned to the CIC process.

The modified Zadra process incorporates a heated sodium hydroxide solution under high pressure, which forces the precious metals back into solution at high concentrations, creating a rich electrolyte solution. The electrolyte solution then passes through a series of electrowinning cells where the precious metals are plated, producing a precious metal sludge. Wharf then ships the sludge to a third-party refinery for further processing. Alternatively, Wharf has the capability to produce doré in the on-site refinery using a furnace to smelt the sludge.

Wharf ships carbon fines off site for precious metals removal. Wharf also ships spent environmental carbon, used for either cyanide or mercury collection, off site for approved disposal.

Over this current audit cycle, Wharf has only purchased liquid sodium cyanide from Cyanco Company, L.L.C. (Cyanco), delivered to the site in tankers mounted on trailer chassis. A full load contains approximately 6,000 gallons of 30% aqueous solution. Thus, the WAD cyanide concentration of the solution delivered to the site

is 300,000 mg/L or parts per million (ppm). Aside from this reagent-grade cyanide, Wharf targets the cyanide concentration of the barren solution to maintain WAD cyanide concentrations in the PLS below 50 mg/L in open waters throughout the process circuit.

A simplified Process Plant flowchart is presented in Figure 2.

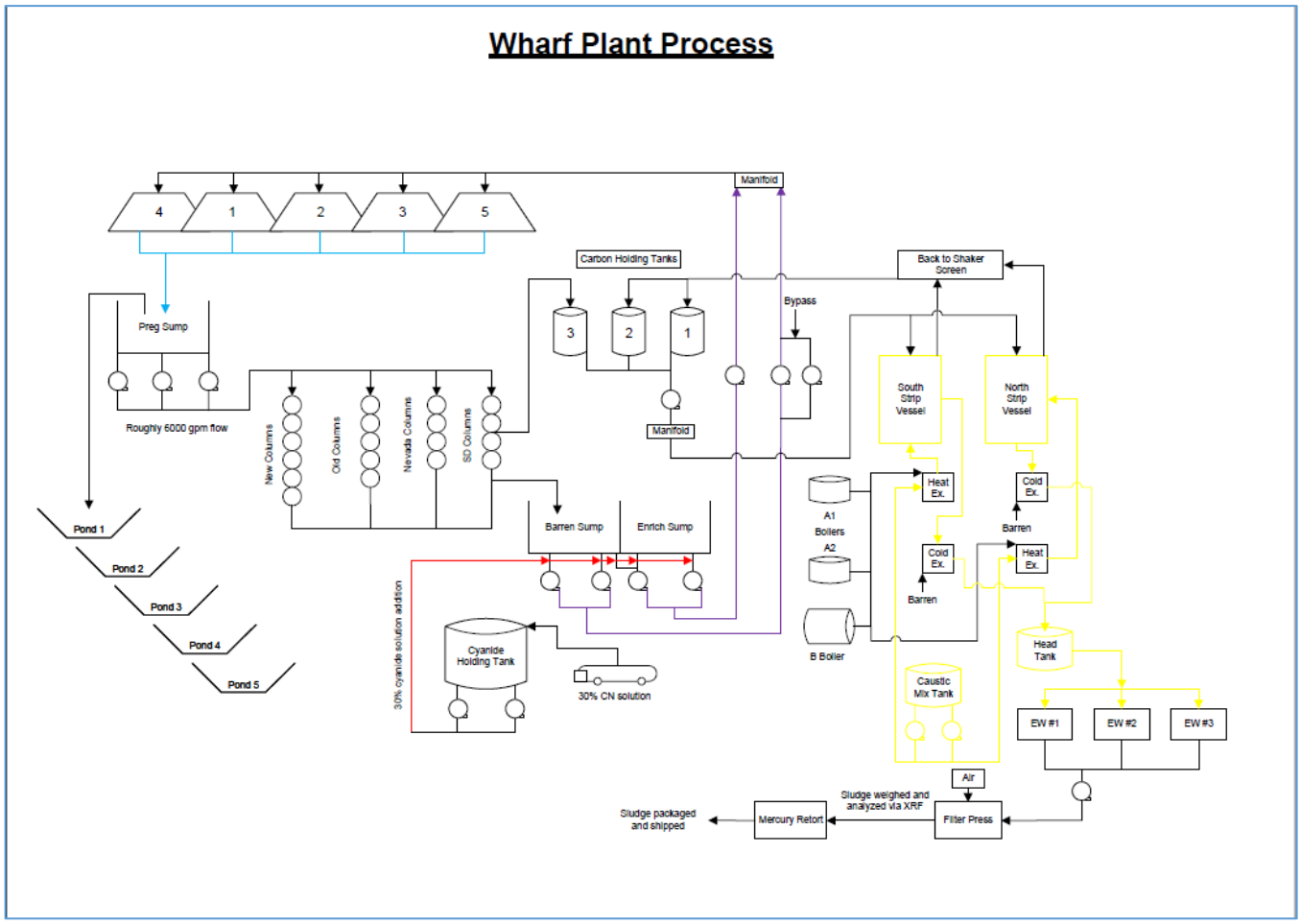

Figure 2: Simplified Process Plant Flowchart

2.3 Cyanide Facilities

The cyanide facilities (as per Code's definition as any facility with solution with a WAD cyanide concentration of 0.5 mg/L or greater) consist of the following:

- Cyanide offloading and storage tank area (cyanide offloading pad, cyanide storage tank and corresponding secondary containment, and their associated pipelines and pumps)
- Process Plant including:
  - Process tanks and sumps
  - CIC Tanks: New Columns (6), Old Columns (5), Nevada Columns (4) and South Dakota Columns (4)

- Associated pumps, piping, valves, supports, transfer and handling systems
- Associated concrete secondary containments (floors, curbs, stem walls, sumps)

- Heap leach facilities including:
  - Pads (1, 2, 3, 4 and 5)
  - Process ponds: Pregnant Pond, Barren Pond, Overflow Pond and Contingency Pond
  - Process solution pipelines and secondary containment channels
  - Associated pumps, piping, and LDCRS
- Cyanide treatment system including the neutralization tank, neutralization pond and associated pumps, piping, concrete secondary containment and LDCRS

The Neutralization Pond, located near the Process Plant is used to denitrify plant influent. Water from the process ponds either reports to the Process Plant or is transferred from the Neutralization Pond (only if WAD cyanide concentration is below 0.5 mg/L) to either the Reliance Pond or Ross Valley Holding Pond (non-cyanide process ponds). Wharf currently operates under the Surface Water Discharge Permit No. SD0025852. Under this permit, there are two allowable discharge points from the Ross Valley Treatment Plant (a non-cyanide facility): Station 006A (Annie Creek downstream of Reliance Pond) and Station 006B (Ross Valley Creek downstream of Ross Valley Pond). Wharf can also discharge treated water via land application under allowance provided by a technical revision to its Large Scale Mining Permit with the South Dakota Department of Environment and Natural Resources (DENR) via the Portland Spray System located at the old Deep Portland Pit.

Laboratories and refineries are two uses of cyanide at gold mines not evaluated under the Code, and therefore they have been excluded from this audit. The electrowinning cells associated with the ADR process are located inside the refinery.

Wharf was initially certified with the Code on January 03, 2013, and last recertified on March 14, 2019. This recertification cycle covers the period from March 2019 to the present.

Wharf has not had any “significant cyanide incidents” subject to the notification requirements of the International Cyanide Management Institute (ICMI) (as per Section VI.A of the Code's Signatory and Certification Process document) during this recertification period. Wharf had three cyanide releases, not considered significant as per Code’s definition, that fell under Standard of Practice 9.2. These cyanide releases have been reported to regulators as per permit requirements as indicated in Standard of Practice 9.2.

SUMMARY AUDIT REPORT

Auditors Findings

Wharf is:	☒ **in full compliance with**	**The International Cyanide Management Code**
	☐ in substantial compliance with	
	☐ not in compliance with	

The operation has not experienced compliance problems during the three-year audit cycle.

Audit Company: Golder Associates USA Inc. (Golder Associates Inc. has recently merged into Golder Associates USA Inc.)

Audit Team Leader: Ivon Aguinaga, Lead Auditor and Mining Technical Specialist

Email: Ivon_Aguinaga@golder.com

Name of Other Auditors

Name, Position	Signature
None	

Dates of Audit

The recertification audit was undertaken over four days, from October 25 to 28, 2021.

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

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

Wharf Mine
Name of Facility

Ivon Aguinaga
Signature of Lead Auditor

March 24, 2022
Date

PRINCIPLE 1 – PRODUCTION

Encourage Responsible Cyanide Manufacturing by Purchasing from Manufacturers that 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.**

☒ **in full compliance with**

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

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with 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.

Over this audit cycle, Wharf has only purchased sodium cyanide manufactured by Cyanco in its production facility in Winnemucca, Nevada. This production facility was initially certified in October 2006 and most recently recertified with the Code in December 2019. The Cyanco transload facility in Cheyenne, Wyoming, was initially certified in February 2017, and most recently recertified in December 2020. The auditor verified compliance through the review of the Cyanco summary audit reports posted on the ICMI website. The auditor also reviewed examples of bills of lading from Cyanco to confirm the cyanide supply chain from the production facility to the mine site.

PRINCIPLE 2 – TRANSPORTATION

Protect Communities and the Environment during Cyanide Transport

Standard of Practice 2.1: **Require that cyanide is safely managed through the entire transportation and delivery process from the production facility to the mine by use of certified transport with clear lines of responsibility for safety, security, release prevention, training, and emergency response.**

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 2.1**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 2.1; require that cyanide is safely managed through the entire transportation and delivery process from the production facility to the mine by use of certified transport with clear lines of responsibility for safety, security, release prevention, training, and emergency response.

Wharf has maintained copies of bills of lading from Cyanco describing the entire cyanide transportation supply chain from their production facility in Winnemucca, Nevada to the mine site. Also, the summary audit reports posted on the ICMI website identify all the elements of the cyanide supply chain.

The Cyanco cyanide transportation supply chain elements include the Cyanco production facility in Winnemucca, Nevada; the Cyanco North American rail and truck supply chain; the Cyanco transload facility in Cheyenne, Wyoming; and transportation to the mine site by TransWood Inc. (TransWood). All are certified with the Code.

Compliance was verified by reviewing the Code summary reports, and examples of bills of lading for the recertification period.

PRINCIPLE 3 – HANDLING AND STORAGE

Protect Workers and the Environment during Cyanide Handling and Storage

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 3.1**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 3.1; design and construct unloading, storage and mixing facilities consistent with sound accepted engineering practices, quality control/quality assurance procedures, spill prevention, and spill containment measures.

As described in the 2019 recertification audit report, Wharf has designed and constructed their cyanide offload and storage facilities in accordance with cyanide producers' guidelines, applicable jurisdictional rules and sound and accepted engineering practices. No physical changes have occurred to the offload and storage facilities over this audit cycle. No physical changes occurred to these facilities over the 2019 audit cycle either. The design of the cyanide offload and storage facilities were evaluated and found fully compliant during the 2013 initial audit and 2016 recertification audit; and remain compliant this audit cycle. The auditor observed the cyanide offload and storage facilities to be in good condition at the time of the site visit.

The cyanide offload and storage facilities are located away from people and surface water bodies. These facilities are also located in a secure area with adequate ventilation to prevent the build-up of hydrogen cyanide (HCN) gas. The cyanide offload area is located outside on the north side of the Process Plant. The cyanide storage tank is also located outside on the west side of the Process Plant. A fixed HCN gas monitor is located inside the pump house shed (a small, prefabricated plastic structure) housing the distribution pumps for the cyanide storage tank. The cyanide storage tank and the distribution pumps are within a chain link fence with a locked gate. During cyanide offload events, Wharf barricades all access points to the cyanide offload and storage facilities. All the cyanide valves of the cyanide offload and storage areas are secured (via locks and blind flanges) to prevent inadvertent opening and potential exposures. There is no public access near the Process Plant and process ponds. Only authorized personnel can enter the cyanide storage tank area. Therefore, the offload and storage areas are secure and away from people.

The cyanide offload pad is a reinforced concrete slab placed over a polystyrene barrier that, in combination, minimizes seepage to the subsurface. The low point of the offload pad contains a drainpipe inside a larger diameter pipe that runs to the adjacent Overflow Pond, thus providing secondary and tertiary containment of any leakage from the tanker. Wharf also installed the cyanide storage tank within a reinforced concrete secondary containment that prevents seepage to the subsurface. A pipe-in-pipe drain, located at the low point of the storage tank secondary containment area, reports to the adjacent Overflow Pond. During the site visit, the auditor observed the offload pad and the cyanide storage tank secondary containment to be in good condition.

Wharf has implemented a method to prevent the overfilling of cyanide storage tank via a telemetry system, which Cyanco monitors remotely to schedule cyanide deliveries and to prevent dispatching deliveries when the cyanide storage tank is too full to accept an entire load. The tank has a level sensor and alarms (both audible alarms and flashing lights). Wharf indicated that Cyanco monitors cyanide consumption and compares the consumption rates to the readings provided by the tank level instrumentation to verify that the instrumentation is functioning properly.

The cyanide storage tank is in an isolated area separate from incompatible materials such as acids, oxidizers, and explosives, as well as separate from foods, animal feeds, and tobacco products.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 3.2**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 3.2; operate unloading storage and mixing facilities using inspections, preventative maintenance, and contingency plans to prevent or contain releases and control and respond to worker exposures.

Wharf has implemented procedures to manage empty tankers and prevent them from being reused. Wharf has only received liquid cyanide in tankers over this audit cycle. The empty tankers are returned to Cyanco immediately after the offload is completed and therefore, no empty cyanide containers require disposal. Once the offload is complete, the TransWood driver rinses off the fittings and with the spotter inspects the tanker to ensure that the offload pad is free of debris and drips, that the tanker is not dented or leaking, that all valves are closed, and caps are back in place.

Wharf has implemented procedures to prevent exposures and releases during cyanide offloading. These procedures address operating valves, timely cleanup of spills, required protective personnel equipment (PPE), and the use of a spotter for safety during the offload. Finally, Wharf receives liquid cyanide with Carmoisine dye added by Cyanco prior to delivery at Wharf. A cyanide offload event was observed during the site visit to verify the implementation of these procedures. The auditor also interviewed process personnel and the Cyanco driver.

PRINCIPLE 4 – OPERATIONS

Manage Cyanide Process Solutions and Waste Streams to Protect Human Health and the Environment

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 4.1**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 4.1; implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventative maintenance procedures.

Wharf has developed and implemented written management and operating plans and procedures for all their cyanide facilities. The list of cyanide facilities (i.e., facilities with concentrations of WAD cyanide greater than or equal to 0.5 mg/L) is unchanged from the previous audit cycle and includes the following:

- Cyanide offloading and storage tank area (cyanide offloading pad, cyanide storage tank and corresponding secondary containment, and their associated pipelines and pumps)
- Process Plant including:
  - Process tanks and sumps
  - CIC Tanks: New Columns, Old Columns, Nevada Columns, and South Dakota Columns
  - Associated pumps, piping, valves, supports, transfer and handling systems
  - Associated concrete secondary containments (floors, curbs, stem walls, sumps)
- Heap leach facilities including:
  - Pads (1, 2, 3, 4 and 5)
  - Process ponds: Pregnant Pond, Barren Pond, Overflow Pond and Contingency Pond
  - Process solution pipelines and secondary containment channels
  - Associated pumps, piping, and LDCRS
- Cyanide treatment system including the neutralization tank, neutralization pond and associated pumps, piping, concrete secondary containment and LDCRS

The Neutralization Pond, located near the Process Plant is used to denitrify plant influent. Water from the process ponds either reports to the Process Plant or is transferred from the Neutralization Pond (only if WAD cyanide concentration is below 0.5 mg/L and a Pond Transfer Permit is approved) to either the Reliance Pond or Ross Valley Holding Pond (non-cyanide process ponds). The auditor reviewed a representative set of Pond Transfer

Permits to verify that WAD cyanide concentrations were less than 0.5 mg/L for the transfers occurred during this recertification period.

Operating procedures cover procedures for the safe operation of the entire cyanide management at Wharf. The procedures include process descriptions, operating tasks, inspections, maintenance, and contingency procedures. Each procedure details task-specific measures and PPE requirements.

Wharf has procedures that identify the assumptions and parameters on which the facility design was based and any applicable regulatory requirements including pond freeboards, pond capacities, action levels for different precipitation events (rain and snow events), monitoring requirements, discharge limits, and others. In addition, Wharf has developed procedures for non-standard operating situations that have the potential for cyanide exposures and releases including actions. These contingency procedures include actions for water balance upset conditions, different scenarios of flow into the LDCRS at the ponds and pads, contaminated surface flow down a dry drainage, contaminated groundwater, contaminated surface water, and others. Wharf has a procedure that provides actions for short-term and long-term temporary shutdown scenarios. The auditor verified compliance by reviewing written procedures and by interviews with process and safety personnel.

Wharf has developed a procedure that describes the measures to ensure that changes are evaluated for potential environmental, safety and health risks, and that appropriate actions are taken to ensure existing performance levels are not compromised. This procedure also addresses the requirements for managing planned and unplanned or emergency changes. The procedure includes a form to be filled out for evaluation of the proposed changes by the proposer with sign-off by supervisors up to the Mine General Manager, based on the level of the change. Wharf provided examples of changes related to the cyanide facilities evaluated during this audit cycle and that were signed by the various department managers including the process, environmental, and safety managers.

Wharf has inspected the cyanide facilities on an established frequency sufficient to assure and document that they are functioning within design parameters. The inspection frequencies are every shift, daily, weekly, monthly, or annually depending on the facility. The inspections cover all cyanide facilities and activities including cyanide offloading and storage areas, the Process Plant, ponds, and the heap leach pads. Wharf conducts inspections of process tanks, pipelines, pumps, valves and secondary containments for physical integrity, the presence of leaks, available capacity for the secondary containments, and others. Wharf also conducts inspections of the LDCRS for the ponds and heap leach pads. In addition, Wharf inspects the ponds for water levels and for wildlife presence and mortality. The heap leach facilities are located on a ridge top that is the headwaters for several drainages. As such, there are no upgradient surface water diversion structures that require inspection. Inspections are documented. The inspection forms include the name of the inspector, date, and observed deficiencies. Corrective actions are documented through work orders. The auditor reviewed completed examples of the inspection forms to verify compliance. During the site visit, the auditor also verified that the facilities were in good condition.

Wharf has implemented a maintenance program to ensure that equipment and devices function as necessary for safe cyanide management. Wharf uses a written procedure for Preventative Maintenance and the Oracle software to manage its maintenance activities, which includes both preventative (scheduled) maintenance and corrective (unscheduled) maintenance. The program includes cyanide facilities in all process areas, including the cyanide offloading and storage areas, Process Plant, ponds, and heap leach pads. The program covers the fixed HCN monitors, tanks, pumps, back-up generators, and others.

Wharf has three backup generators (two 1,750-kilowatt generators and a 600-kilowatt generator) to prevent unintentional releases and exposures. The generators can power the entire solution management system during power outages, as well as both process and administrative operations. Wharf has regularly maintained the backup generators throughout the recertification period, as evidenced by a maintenance schedule and examples of completed maintenance forms.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 4.2**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 4.2; introduce management and operating systems to minimize cyanide use, thereby limiting concentrations of cyanide in mill tailings.

Standard of Practice 4.2 is inapplicable because Wharf does not have a mill or generate tailings.

Standard of Practice 4.3: Implement a comprehensive water management program to protect against unintentional releases.

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 4.3**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 4.3; implement a comprehensive water management program to protect against unintentional releases.

Wharf has developed a comprehensive and probabilistic water balance in 2011. This model was evaluated as part of the 2013 initial certification audit. Wharf has continued to use the water balance model without changes since 2011. Wharf has not constructed any new cyanide facilities or modified the existing cyanide facilities over this audit cycle; therefore, the findings presented in the 2019 Recertification Audit Report remain valid. The model is comprehensive in that it considers the application rate at which solutions are applied to leach pads, an ore loading schedule, on-site measured precipitation data, and the effects of unplanned power outage. The model also incorporates discharges to surface water via the treatment system and considers freezing and thawing via the rain-on-snow event. The mine is located on a ridge and the cyanide facilities do not have uphill run-on areas. The water balance is probabilistic in that it includes extreme events and climate wet cycles. The extreme events include the 100-year, 24-hour storm event of 5 inches and the state-mandated storm event of 19.6 inches (nearly the Probable Maximum Flood of 22.5 inches).

Wharf has designed and operated ponds with adequate freeboard above the maximum design storage capacity. Wharf maintains three feet of freeboard in the Contingency Pond. The process ponds are configured with

spillways such that the Pregnant Pond overflows to the Barren Pond, which in turn overflows to the Overflow Pond, which in turn overflows to the Contingency Pond. Additionally, the Neutralization Pond overflows to the Contingency Pond. Wharf pumps water from the Contingency Pond to the Neutralization Pond after destruction of the cyanide in the Contingency Pond. Therefore, the Contingency Pond is the only process pond with the potential to overtop. Wharf also maintains a target pond capacity of 19.6 inches (nearly the size of the 6-hour Probable Maximum Flood) as required by DENR. Wharf has discharged water via approved permit following proper treatment during periods of 2019, 2020 and 2021 to maintain the target pond capacity of 19.6 inches.

Wharf conducts inspection and monitoring activities to implement the water balance and prevent overtopping of ponds and unplanned discharge of cyanide solutions to the environment. Each process pond is equipped with an automated sensor for monitoring pond levels. Also, pond levels are recorded by the operators during daily inspections. Wharf updates the water balance daily with both precipitation and pond levels specifically to avoid overtopping incidents. The auditor reviewed pond level and capacity data for the recertification period to verify compliance.

Wharf maintains one weather station located at the Process Plant equipped with a rain gauge that records precipitation daily. These records are tracked and used on the daily updates of the water balance, which provides continual comparison of results to design and operating parameters. Wharf has also hired an external consultant in 2019 to review the hydraulic analysis used in the water balance model and confirm that this analysis is still current based on the site precipitation data. The auditor reviewed the recorded precipitation data and an email by the external consultant presenting the results of his evaluation to verify compliance.

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

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 4.4**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 4.4; implement measures to protect birds, other wildlife, and livestock from adverse effects of cyanide process solutions.

Wharf has installed an eight-foot high, wire-mesh game fence surrounding the perimeter of the mine site to restrict access by wildlife. Wharf maintains the fence and inspects it annually as part of the Game/Fence/Gate Inspections. In addition, Wharf maintains the WAD cyanide concentrations in open waters below 50 mg/L as required under the procedure entitled “Maintain WAD in Open Waters below 50 PPM”. Wharf has demonstrated that the WAD cyanide concentrations have been less than 50 mg/L in open waters (i.e., Pregnant Pond, Barren Pond, Overflow Pond, Contingency Pond and Neutralization Pond) without physical restrictions over the recertification period with a few isolated exceptions. The auditor reviewed WAD cyanide data for the ponds over the recertification period to verify compliance.

Wharf has prevented significant wildlife mortality by maintaining WAD cyanide concentrations less than 50 mg/L. Wharf has reported 12 wildlife mortalities. However, none of the mortalities were related to contact with open waters (except for the one that occurred in August 2021 in the Contingency Pond).

Wharf applies cyanide solution to the top surface of the leach pads via aboveground distribution headers and buried drip emitters. This approach inherently limits the potential for ponding and eliminates the overspray from the top surface. Wharf applies process solution to the side slopes of the heaps using spray wobblers located on benches. During summer months, Wharf uses wobblers on the top surfaces of the inactive heaps. Wharf implements the Procedure for Ponding and Secondary Containment to manage ponding on the pads if it occurs. The auditor observed the leach pads that Wharf was actively leaching during the site visit to verify compliance. The auditor did not identify any areas of significant ponding or areas of overspray off the leach pad liner.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 4.5**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 4.5; implement measures to protect fish and wildlife from direct and indirect discharges of cyanide process solutions to surface water.

Wharf currently operates under the Surface Water Discharge Permit No. SD0025852. Under this permit, there are two allowable discharge points from the Ross Valley Treatment Plant (not a cyanide facility): Station 006A (Annie Creek downstream of Reliance Pond) and Station 006B (Ross Valley Creek downstream of Ross Valley Pond). Wharf has only discharged treated water from Station 006A during this audit cycle. Wharf has sampled the discharged water and reported the sample results in monthly Monitoring Reports to DENR. The auditor reviewed WAD cyanide data at Station 006A, which showed all results were below the detection limit of 0.010 mg/L over the recertification period.

Wharf has also discharged treated water via land application under a technical revision to its Large Scale Mining Permit with DENR via the Portland Spray System located at the old Deep Portland Pit. Wharf provided the written reports for land application submitted to DENR for each discharge episode this audit cycle. The reports showed all WAD cyanide results were below the detection limit of 0.010 mg/L over the recertification period.

Surface Water Discharge Permit No. SD0025852 does not include any established mixing zones. The permit includes acute (daily maximum) and chronic (30-day average) surface water standards for WAD cyanide. In accordance with Permit No. SD0025852, surface water is monitored at Stations 001, 002, 003, and 005. These stations are also established to detect indirect discharges to surface water, if any. Station 003 has not had any flowing water during the recertification period, and consequently, there are no data. WAD cyanide data for Stations 001, 002 and 005 showed that all results were below the detection limit of 0.010 mg/L and below the acute and chronic surface water standards for WAD cyanide. Since the free cyanide component in a sample cannot be greater than the WAD cyanide component; the water quality data demonstrate that if any indirect discharge to surface water has occurred, it has not resulted in a free cyanide concentration greater than 0.022 mg/L.

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

☒ **in full compliance with**

The operation is ☐ in substantial compliance with **Standard of Practice 4.6**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 4.6; implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.

Wharf has implemented measures to manage seepage from cyanide facilities to protect the beneficial uses of groundwater. No physical changes to the cyanide facilities have occurred since the 2019 recertification audit. The leach pads are constructed with a double liner and an LDCRS wherein collected solutions are pumped from the underdrain system to the process ponds. Pipes associated with the heap leach pads are contained within high-density polyethylene (HDPE)-lined secondary containment channels that flow back to the process ponds in the event of leakage. The process ponds are triple-lined with an LDCRS consisting of a primary (upper) and secondary (lower) layer. The entire leach pad, channel, and pond areas are an integral liner and LDCRS. The Process Plant and the cyanide offload and storage facilities have concrete secondary containments for tanks and pipelines. The concrete secondary containments all ultimately drain to the process ponds, thus providing tertiary containment and further protection of groundwater. Wharf conducts regular inspections and monitoring of all process facilities to ensure to ensure physical integrity of these protective systems.

Wharf's facilities are located within the Madison aquifer, which has a designated use of drinking water. DENR has established a standard of 0.75 mg/L for WAD cyanide in groundwater. The standard for free cyanide in drinking water at the point of use is 0.2 mg/L. There is no standard established for total cyanide. Wharf monitors groundwater at the cyanide facilities (i.e., the heap leach pads and process ponds) at nine monitoring wells and downgradient of these facilities at three monitoring wells. The auditor reviewed WAD cyanide data that showed results for all the wells were less than the detection limit of 0.010 mg/L during the recertification period.

The question regarding use of mill tailings as underground backfill is inapplicable because the operation does not have mill or underground workings.

Wharf has not caused cyanide concentrations of groundwater to rise above levels protective of beneficial use and therefore is not engaged in groundwater remediation.

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

☒ **in full compliance with**

The operation is ☐ in substantial compliance with **Standard of Practice 4.7**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 4.7; provide spill prevention or containment measures for process tanks and pipelines.

Wharf provides spill prevention or containment measures for all cyanide-related tanks and pipelines. Wharf has not changed these measures since the 2013 initial audit; therefore, the full compliance findings described in the initial audit report and included in the 2019 recertification audit report are still valid.

The cyanide storage tank resides within a reinforced concrete secondary containment. The process tanks located inside the Process Plant building also reside within secondary containment provided by the building's reinforced concrete floor and stem walls. The secondary containment provided for the cyanide offload pad, the cyanide storage tank, and the process solution tanks inside the Process Plant building all ultimately drain by gravity to the Overflow Pond, which acts as a tertiary containment. The secondary containment for the cyanide storage tank has a capacity to approximately hold 138% of the tank volume. The secondary containment provided by Process Plant floors and stem walls was not designed with a specific containment capacity; however, the Overflow Pond, acting as a tertiary containment, provides adequate containment capacity for all of the process tanks. In addition to these containment measures, Wharf implements the Procedure for Ponding and Secondary Containment, which provides measures for characterizing the spilled solution and pumping it back into primary containment. The auditor observed the secondary containment areas to be in good condition during the site visit. The auditor also reviewed the Procedure for Ponding and Secondary Containment and interviewed process personnel to verify compliance.

Wharf has constructed all pipelines with spill prevention or containment measures to collect leaks and prevent releases. All reagent-grade cyanide pipelines are either located over concrete containment or constructed as pipe-in-pipe systems when placed over natural ground. All leach solution pipelines reside within HDPE-lined containment channels that report to the Pregnant Pond. The leach pads, containment channels, and process ponds form an integral liner system without long runs of process pipelines. Additionally, the pipelines running between the Process Plant and leach pads are equipped with spill prevention in the form of high/low flow alarms linked to the Process Plant control room. There are no areas where cyanide pipelines present a risk to surface water that might require special protection needs.

Cyanide tanks and pipelines are constructed of materials compatible with cyanide and high pH conditions. The cyanide tanks and pipelines are stainless steel and HDPE. These materials are compatible with cyanide and high pH conditions. This was confirmed by visual observations during the site visit and interviews with process personnel.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 4.8**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 4.8; implement quality control/quality assurance procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

Construction quality assurance and quality control (QA/QC) programs have been implemented for all the cyanide facilities. Construction QA/QC programs including their content were evaluated and found compliant during the 2013 initial certification audit, and the 2016 and 2019 recertification audits. Qualified personnel have reviewed and approved the QA/QC documentation evaluated during those audits. Wharf has not constructed new cyanide facilities during this recertification period. No physical changes to existing cyanide facilities have occurred either. The auditor observed the cyanide facilities to be in good condition at the time of the site visit.

Wharf has retained QA/QC records for the cyanide facilities by a combination of electronic and hardcopy files. The auditor spot checked the list of evidence from the 2013, 2016, 2019 audits against the hard and electronic copies on site to verify documents were retained.

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

☒ **in full compliance with**

The operation is ☐ in substantial compliance with **Standard of Practice 4.9**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 4.9; implement monitoring programs to evaluate the effects of cyanide use on wildlife, and surface and groundwater quality.

Wharf has developed written procedures for water and wildlife monitoring. Written procedures for water monitoring include collection of groundwater and surface water samples, as well as for preservation, storage, handling, and documentation. Procedures also includes surface water and groundwater sampling techniques, sampling equipment, preparation of field log sheets, decontamination of sampling equipment, identification of monitoring locations, and establishment of frequencies. Written procedures for wildlife monitoring include procedures for wildlife mortality monitoring, retrieval, and reporting. Sampling and analytical protocols been developed by appropriately qualified personnel. Sampling and analytical protocols are also annually audited by the State of South Dakota. The auditor the written procedures to verify compliance.

Wharf has documented sampling conditions and field parameters (such as weather conditions, turbidity, conductivity, pH, water temperature and dissolved oxygen) in a field notebook. Chain of custody forms also include the names of the sampler and the date and time of sampling.

Wharf has conducted monitoring at frequencies adequate to characterize the medium being monitored and to identify changes in a timely manner. LDCRS are inspected daily at the ponds and weekly at the heap leach pads. Discharges and surface water have been monitored biweekly. Groundwater has been monitored monthly to quarterly. Wildlife has been monitored daily. The auditor reviewed monitoring data to verify compliance.

PRINCIPLE 5 – DECOMMISSIONING

Protect Communities and the Environment from Cyanide through Development and Implementation of Decommissioning Plans for Cyanide Facilities

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 5.1**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 5.1; plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife, and livestock.

The Wharf Mine Cyanide Facilities Decommissioning Plan includes written procedures to decommission the cyanide facilities. Section 4.0 of this plan provides decommissioning procedures for the heap leach facilities (leach pads and process ponds), Process Plant (tanks, plant components and piping), cyanide offload and storage facilities, concrete foundations, and structures. The plan describes measures to decontaminate cyanide-related equipment by rinsing until WAD cyanide concentrations are less than 0.5 mg/L. It also describes measures for disposition of residual cyanide, neutralization of process solutions, rinsing of the pad spent ore, and management of heap leach draindown solutions by treatment (i.e., cyanide neutralization, carbon treatment, biological denitrification, and discharge via discharge permits.

The decommissioning plan also includes an implementation schedule for decommissioning activities. Wharf will commence draindown and offload of the heaps and closure of the cyanide offload and storage facilities once ore processing ceases in Year 1 and Year 2 of closure. During Year 3 to Year 5, process solution will be denitrified and discharged. Dismantlement and foundation demolition of the process facility will be completed by Year 6.

Wharf has regularly reviewed and revised its decommissioning procedures for cyanide facilities as per South Dakota bonding program requirements. The October 2018 version of the decommissioning plan was updated in October 2021 during this audit cycle.

The auditor reviewed the 2021 and 2018 versions of the decommissioning plan and interviewed environmental personnel to verify compliance.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 5.2**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 5.2; establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.

Wharf has developed closure costs for fully funding third party implementation of the cyanide-related decommissioning activities. The cost estimate covers the appropriate cyanide facilities. The costs have been calculated using the model “BONDCALC Program”, developed by the State of South Dakota. The model includes third party costs for the closure of all cyanide facilities.

Wharf has reviewed and updated its closure cost estimate annually as part of its annual Asset Retirement Obligation (ARO) process. Also, the closure costs have been reviewed and approved by the State of South Dakota every three years as part of the site reclamation bond obligation. The auditor reviewed the ARO estimates for 2019 and 2020 to verify compliance. The auditor also reviewed the 2020 bond calculations, approved by the State of South Dakota.

Wharf has established a financial mechanism through reclamation bonds, approved and held by the State of South Dakota, to cover the estimated costs for cyanide-related decommissioning activities. Wharf provided copies of seven bond instruments, approved by the State of South Dakota, and covering the reclamation bond obligation.

The auditor reviewed the bond instruments, and the 2020 and 2019 cost estimates to verify compliance.

PRINCIPLE 6 – WORKER SAFETY

Protect Workers' Health and Safety from Exposure to Cyanide

Standard of Practice 6.1: Identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce, and control them.

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 6.1**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 6.1; identify potential cyanide exposure scenarios and take measure as necessary to eliminate, reduce, and control them.

Wharf has developed and implemented procedures that describe the practices to minimize worker exposure during offloading and plant/pad operations, entry into confined spaces, and equipment decontamination. The procedures describe the specific procedures to conduct each task and adequately describe safe work practices. The procedures also detail PPE and inspection requirements. The auditor reviewed the procedures and interviewed the process and safety personnel to verify the implementation of these procedures. The auditor observed signage requiring PPE and workers wearing the appropriate PPE during the site visit.

Wharf has conducted pre-work inspections prior to cyanide offload. These pre-inspections are documented in a checklist and include the verification of the offload pad, confirmation of the cyanide solution concentration and pH, inspection of the tanker, verification of the cyanide storage level before and after offloading, and others. In addition, Wharf has conducted regular inspections of all its cyanide facilities including the cyanide offload and storage facilities, the Process Plant, the pads, and the ponds.

Wharf has solicited and actively considered worker input in developing and evaluating procedures. This is accomplished through direct communication between the operator and the supervisor, weekly safety meetings, and job hazard assessments. During weekly meetings, procedures and safety issues are discussed. Through the job hazard assessments, safety procedures and concerns are evaluated. Identified hazards/concerns are tracked and evaluated with corrective actions developed when applicable.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 6.2**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 6.2; operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.

Wharf has developed procedures that specify the pH for limiting the evolution of HCN gas during cyanide offload and production activities. Procedures and process forms specify a pH rage of 9.5 to 13.2 for cyanide offload and a pH target of 9.5 to 10.5 for production facilities. The auditor reviewed pH data for cyanide offload and production activities showing that the pH was maintained in the specified range.

Wharf has installed fixed HCN monitors in strategic locations and has required workers to wear portable HCN monitors while performing cyanide-related activities. The procedures also require PPE in the areas where the cyanide is being used and during the activities described in the procedures such as cyanide offload, and plant and maintenance activities. Wharf maintains portable HCN monitors in the Process Plant Safety Coordinator's Office and other locations. No modifications to the process or the cyanide facilities have occurred over this audit cycle and therefore the areas and activities with potential exposure to HCN gas previously identified are still valid. The auditor observed the monitors and verified the readouts were functional. The auditor also observed workers wearing the portable HCN monitors. The fixed HCN monitors alarm at 4.7 ppm. The portable monitors alarm at 4.7 ppm and 10 ppm. Both alarm settings trigger a MAYDAY event and require evacuation.

Wharf has maintained, tested, and calibrated HCN gas monitoring equipment at a frequency recommended by the manufacturers. Wharf has calibrated the fixed monitors every 90 days. Portable HCN monitors are bump tested prior to their use and calibrated every 90 days. Wharf has retained the calibration records for at least three years.

Wharf has installed signage around the cyanide offload and storage areas, Process Plant, ponds, and the heap leach pads advising workers that cyanide is present, and that smoking, flames, eating, and drinking are not allowed. In addition, Wharf has labeled cyanide related tanks and piping to alert workers of their contents and the direction of flow. The auditor observed that all other cyanide related pipelines were appropriately labeled.

Wharf has installed safety showers and eyewash stations, and dry powder fire extinguishers in strategic locations throughout the mine. The safety showers, eyewash stations and fire extinguishers are tested, inspected, and maintained on a regular basis. The auditor randomly tested selected safety showers and eyewash stations during the site visit to confirm they were operational and that water pressure in the eyewashes was not too high. Also, the auditor randomly checked selected fire extinguishers to verify they were the correct type.

Safety Data Sheet (SDS) information for on-site chemicals is available to all employees electronically (24 hours per day, via the Wharf intranet). Additionally, hardcopies of the SDSs, and emergency and first aid procedures for cyanide are available in every department and in the Process Plant control room. SDS information is in English, the language of the workforce. The auditor observed the SDSs and procedures to verify compliance.

High strength cyanide solution is dyed for clear identification. Wharf receives liquid cyanide with Carmoisine dye added by Cyanco prior to delivery at Wharf. The auditor reviewed a letter from Cyanco confirming that they have been shipping sodium cyanide with a red dye incorporated into the solution starting the week of April 15, 2018. The Cyanco SDS for Cyanco Sodium Cyanide Solution also indicates the addition of Carmoisine dye to the solution.

Wharf has developed and implemented procedures for investigating and evaluating all incidents, including cyanide exposures and releases, with the intent to determine if the operation's policies and programs to prevent such incidents are adequate or whether they require revision. These procedures are included in the Coeur Wharf Site Emergency Response Plan (ERP). The incident investigation procedures are framed and implemented through the Intelex software (Intelex). This electronic data management program provides a variety of avenues to identify the root cause(s) of incidents,

identify corrective actions, and identify actions to prevent reoccurrence. No cyanide related exposure incidents have occurred during this audit cycle. The auditor reviewed the investigation procedures, Intelex reports, and spill reports submitted to DENR for the three actual cyanide-related spills that occurred during this audit cycle to verify the implementation of the investigation procedures.

Standard of Practice 6.3: **Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.**

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Standard of Practice 6.3**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 6.3; develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

Wharf has its own on-site capability (equipment and trained staff) to provide first aid assistance to workers exposed to cyanide. Wharf has water, medical oxygen, a resuscitator, cyanide antidotes, radio system, telephones, and an alarm system readily available for use at the Process Plant and the administration building. Wharf maintains cyanide antidote kits (Cyanokits and oxygen) at various locations on site. Automated external defibrillators (AEDs) are also available on site. Wharf has an Emergency Response Team (ERT) trained to provide first aid to workers exposed to cyanide. Wharf also has a fully equipped Mine Rescue Truck (Class 3 ambulance) with medical oxygen and AED to facilitate the administration of first aid treatment during cyanide exposure incidents. Wharf has inspected the first aid equipment on a regular basis. The Cyanokits and oxygen are inspected monthly by the safety personnel. The Cyanokit and the oxygen located at the Plant Control Room is also inspected daily. The Mine Rescue Truck is inspected twice a month. The auditor reviewed completed inspection forms to verify compliance and visually observed the Cyanokits and oxygen. The auditor had operators open the oxygen tank valves to verify the tanks were charged. The auditor verified that the Cyanokits were stored at the temperature specified by the manufacturer and were not expired.

Wharf has developed written procedures that describe how to respond to cyanide exposures. These procedures are included in the ERP. The procedures contain sections on cyanide symptoms, first aid for cyanide exposure, decontamination, emergency transportation, and advanced medical attention. The ERP indicates that the Cyanokits are to be administered by a paramedic or professional medical staff only. Wharf has developed procedures to transport workers exposed to cyanide to local hospitals for further treatment, if needed. Wharf relies on outside ambulance services for transport of cyanide exposure victims to local hospitals. Victims will be transported via ground ambulance to the Lead/Deadwood Regional Hospital (located approximately 20 minutes from the mine site) or via air ambulance (Black Hills Life Flight and Medical Air

Rescue) to the Rapid City Regional Hospital. Wharf uses its Mine Rescue Truck (Class 3 ambulance) to transport victims to the on-site helipad or other designated rendezvous location, either on-site or off-site. Wharf will provide a Cyanokit to the ambulance paramedics for transport with the exposure victim. Wharf has made formalized arrangements with three local hospitals, the Rapid City Regional Hospital, the Lead/Deadwood Regional Hospital and the Spearfish Regional. Wharf provided a letter to each of these hospitals demonstrating that the hospitals are aware of the potential, and have the capability to treat, cyanide exposure victims. The auditor reviewed copies of the letters sent by Wharf to the three hospitals and interviewed the Health & Safety Coordinator to verify compliance.

PRINCIPLE 7 – EMERGENCY RESPONSE

Protect Communities and the Environment through the Development of Emergency Response Strategies and Capabilities

Standard of Practice 7.1: Prepare detailed emergency response plans for potential cyanide releases.

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 7.1**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 7.1; prepare detailed emergency response plans for potential cyanide releases.

Wharf has prepared an ERP and other response plans covering all areas of the mine and various types of incidents. The ERP and procedures cover scenarios applicable to the site including HCN gas release; transportation accidents; releases during offloading; releases during fires and explosions; leaks from rupture of tanks, valves, pipes, etc.; pond overtopping; power outages and pump failures; seepage from cyanide facilities; and slope failure at the heap leach pads. Wharf utilizes a hydrogen peroxide system to destruct cyanide at the Contingency Pond and, if necessary, in the Neutralization Pond and uses the neutralized solution to rise the pads. The Procedure for Pond Transfer includes actions for the failure of this system.

Planning for response to transportation emergencies has been addressed by both Wharf and their Code certified cyanide producer/transporter, Cyanco. By contract, Cyanco is responsible for all aspects of the transport of sodium cyanide, including emergency response and cleanup/remediation, up to the delivery point at the mine site. By virtue of the certification of Cyanco's supply chains, factors such as chemical form, transportation method, road/rail conditions, and design of the transport vehicle, have been considered. Procedures for releases during offloading are addressed in the ERP.

The ERP and procedures also include procedures for evacuation of site personnel and neighboring stakeholders, cyanide first aid (including antidote use and personnel decontamination), transport to local hospitals, and management of cyanide spills. Procedures for spills include control of the spills at their source, spill containment, neutralization, cleanup, and monitoring. The auditor reviewed the ERP and procedures to verify compliance.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 7.2**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 7.2; involve site personnel and stakeholders in the planning process.

Wharf has involved its workers, stakeholders, and nearby communities in the cyanide emergency planning process and has engaged in consultation or communication with stakeholders to keep their ERP current.

Wharf has involved its workforce through weekly safety meetings, mock drills, and training. During the weekly safety meetings, cyanide-related topics are discussed. Process staff and ERT members have participated in the 2021 and 2019 mock drills and have received emergency response training.

The primary involvement of outside stakeholders in cyanide-related emergencies is ambulance response and administration of the Cyanokit antidote by trained medical professionals or paramedics. Also, local hospitals will provide medical treatment as needed. The local hazardous materials (Hazmat) team and fire departments would support any emergency response related to evacuation and offsite cyanide transportation incidents as needed. Wharf provided cyanide response training to the local emergency agencies and communities in December 2019.

Wharf attends quarterly Lawrence County Local Emergency Planning Committee (LEPC) meetings. LEPC members include local emergency agency representatives from Lawrence County Emergency Management, Lawrence County Search and Rescue, Spearfish Police Department, Lawrence County Sherriff, South Dakota Highway Patrol, local Fire Departments (Deadwood, Lead, Spearfish and Whitewood), Lead/Deadwood Regional Hospital, Spearfish Regional Hospital, Spearfish Ambulance Service, Black Hills Life Flight, and others. During the LEPC meetings, response planning activities are discussed. Wharf sends a hard copy of their ERP annually to the LEPC (confirmed by interview with the Health & Safety Coordinator).

Wharf also attends annual meetings with the Terry Valley Landowners Association (TVLA), representing the residential community located closest to the mine site (approximately 2.5 miles southeast of the cyanide facilities). During the TVLA meetings, updates regarding the mining operation and questions and/or concerns are discussed.

Wharf has made formalized arrangements with three local hospitals: Rapid City Regional Hospital, Lead/Deadwood Regional Hospital, and Spearfish Regional Hospital. Wharf provided a letter to each of these hospitals demonstrating that the hospitals are aware of the potential, and have the capability to treat, cyanide exposure victims.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 7.3**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 7.3; designate appropriate personnel and commit necessary equipment and resources for emergency response.

The Site Crisis Management Plan outlines membership, roles and responsibilities of the Site Crisis Management Team (SCMT), and details specific actions the SCMT should take during crisis situations to minimize the impact on people, the environment, assets, and reputation. This plan details the primary and alternate SCMT members, and their contact information. Wharf has an ERT Contact List that lists the ERT members per crew and includes their work area and contact information. The ERP provides the procedures for initiating and releasing a MAYDAY.

Training requirements for the ERT are included in the ERT training tracking files. Wharf requires that ERT members complete training on cardiopulmonary resuscitation (CPR)/first aid, Hazmat and spill control, airway and oxygen, patient assessments, self-contained breathing apparatus (SCBA), confined space, life flight, splinting rescue/equipment, and others. Wharf has identified its emergency response equipment in various inspection checklists covering cyanide antidote kits, medical oxygen, the spill response kit, fire extinguishers, SCBAs, shower and eyewash stations, HCN monitors, and the Mine Rescue Truck. Wharf uses the checklists to document inspections of the emergency response equipment.

Wharf has on-site response capability for cyanide first aid, evacuation, and spill control, including the use of SCBAs. Thus, Wharf relies on outside medical services (ambulance and local hospital) for transport and treatment of cyanide exposure victims as indicated in the ERP. Local response agencies for Hazmat and fire response would also provide support in the case of evacuation and offsite transportation emergencies. Wharf has confirmed that external entities identified in the ERP are aware of their involvement through written agreements with local hospitals and cyanide response training to the local emergency agencies. The ERP also provides current contact information for outside responders, medical facilities, agencies, and response consultants.

The auditor reviewed the ERP, the Site Crisis Management Plan, and training and inspection records to verify compliance.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 7.4**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 7.4; develop procedures for internal and external emergency notification and reporting.

Wharf has developed an ERP and a Site Crisis Management Plan that contain procedures and contact information for notifying management, regulatory agencies, and medical facilities. These plans also contain procedures and contact information for notifying nearby communities and for communicating with the media.

Wharf has developed a procedure for notifying ICMI of any significant cyanide incidents as defined in ICMI's Definitions and Acronyms document. At the time of the audit, Wharf had not experienced any significant cyanide incidents. The auditor reviewed the procedure and the reports on cyanide incidents that occurred during the recertification period.

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

☒ **in full compliance with**

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

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 7.5; incorporate remediation measures and monitoring elements into response plans and account for the additional hazards of using cyanide treatment chemicals.

Wharf has developed and implemented specific remediation measures as appropriate for the likely cyanide release scenarios. Wharf's procedures include measures to contain, recover and clean up liquid cyanide spills. Spilled cyanide solutions within the Process Plant will be returned to the process circuit. Emergency containment structures would be constructed, if necessary and possible, to minimize the extent of the release. The spill will be neutralized with sodium hypochlorite (a.k.a., bleach). The procedures describe the steps to mix the bleach solution and states that the endpoint for soil decontamination. The procedures also include actions to manage and/or disposal of spill clean-up debris.

The water supply well used by Wharf is located upgradient of the cyanide facilities. Wharf indicated that there are no other drinking water wells located in the immediate vicinity that could potentially be impacted by a cyanide release. Nonetheless, the ERP discusses the distribution of bottled water, as required, in the event Wharf detects cyanide in water supplies. The supply of bottled water would continue until the well water is deemed fit for human consumption based on chemical sampling and analysis.

The Spill Contingency Plan indicates that sodium hypochlorite (bleach), hydrogen peroxide, ferrous sulfate or any other treatment chemical are not to be used to treat a cyanide release to surface water, and that this also applies to dry drainages.

Wharf has developed procedures that address the potential need for environmental monitoring to identify the extent and effects of a cyanide release. These procedures require monitoring of the affected area after cleanup and describe the final cyanide concentration allowed in residual soil as evidence that the release is adequately remediated. Wharf will consult with DENR regarding the frequency and duration of surface and groundwater monitoring in the event of a spill. Sampling and analysis of water and/or soil will follow proper Environmental Protection Agency protocols as outlined in the Wharf's monitoring procedures.

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

☒ **in full compliance with**

The operation is ☐ in substantial compliance with **Standard of Practice 7.6**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 7.6; periodically evaluate response procedures and capabilities and revise them as needed.

Wharf has reviewed, evaluated, and updated its ERP at least once a year during this audit cycle. The ERP includes a table listing the history of the document (indicating two revisions made in 2019, one in 2020 and two in 2021). For each revision, the table lists the revision number, date revised, person who performed the revision and a description of the changes. The ERP was most recently revised in December 2021. The ERP considers the review of the emergency procedures to prevent future accidents following an accident investigation as needed. This can also be applied after mock drills (per interview with Wharf's Health & Safety Coordinator). Wharf staff stated that such reviews have not been needed during this recertification period. The auditor reviewed the 2021 and 2020 versions of the ERP and interviewed Wharf's Health & Safety Coordinator to verify compliance.

Wharf has conducted drills to test response procedures for cyanide exposures and spills in 2019 and 2021. No drill was conducted in 2020 due to COVID restrictions. Wharf has had three cyanide spills over this audit cycle. During the site's response to these spills, the site has also tested their entire response to cyanide spills including spill containment, cleanup, neutralization, sampling, and reporting to DENR. Each drill was accompanied by a report and an evaluation form that included follow-up actions to improve response planning. Response time was also evaluated. The spill reports also included an evaluation of the spill, as well as corrective actions to prevent a similar spill. Even though Wharf could not conduct a cyanide mock drill in 2020 due to COVID restrictions and reduced personnel on-site, the auditor considers that the site is in full compliance with this question since two mock drill scenarios were conducted in 2021 showing the site's commitment to evaluate emergency response procedures. The auditor reviewed the spill reports, the mock drill reports, and evidence that follow up actions were addressed (e.g., training records) to verify compliance.

PRINCIPLE 8 – TRAINING

Train Workers and Emergency Response Personnel to Manage Cyanide in a Safe and Environmentally Protective Manner

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 8.1**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 8.1; train workers to understand the hazards associated with cyanide use.

Wharf has trained mine personnel and contractors that may encounter cyanide in cyanide safety and emergency response procedures. This was done through a cyanide awareness training and a spill prevention training (provided as part of Mine Safety and Health Administration [MSHA] training). The cyanide awareness training covers cyanide physical characteristics, reactivity, potential hazards, potential health effects, cyanide poisoning, dangers of cyanide salts, PPE, HCN alarms, first aid measures, spill response, and other emergency response. The spill prevention training covers cyanide spill response including spill prevention, control, handling, and reporting for cyanide solutions. Refresher training has been provided annually.

Wharf has retained records of cyanide training that include the names of the employee and the trainer, training dates, topics covered, and test results demonstrating an understanding of the training.

The auditor reviewed training presentations and videos. The auditor also reviewed initial training records for new employees and a contractor, as well as annual refresher training records and completed quizzes to verify compliance.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 8.2**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 8.2; train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community, and the environment.

Wharf has task trained workers involved in offloading, production (Process Plant, process ponds and heap leach pads), and maintenance to work safely with cyanide and prevent cyanide releases using the operating procedures. Workers were trained prior to working with cyanide. Training consists of observing and learning the procedures as well as hands-on performance. Wharf documents the training for each operating procedure on a

task training checklist. Each worker has a unique checklist registering each procedure and documenting the training completion date for each procedure along with the signatures of the instructor and trainee. Wharf has developed these checklists for each operator level and process area. In addition to task specific training, safety specific training for the process areas is provided and documented in the Wharf Plant & Pad Site Specific training forms. The procedures serve as the training materials and include the necessary training elements including the purpose, required PPE, safety considerations and the individual task-specific procedures. The auditor reviewed the task training checklist of process technicians that received cyanide related task training over this audit cycle including their completed quizzes to verify compliance.

Wharf has used qualified staff to task train staff. Senior process personnel such as supervisors, with several years of experience in process activities, have provided the task training. Training personnel indicated that Wharf uses qualified trainers under its approved MSHA Training Plan (e.g., the Training Coordinator and Safety Coordinator) for cyanide first aid and emergency response training.

Wharf has provided refresher task training to ensure that operators continue to perform their tasks in a safe and environmentally protective manner. This refresher training has been provided through safety meetings and annual refresher training for cyanide awareness and spill prevention. Refresher training has also been provided by continuous training and evaluation of the process personnel as part of the process needed to graduate to a higher job classification level. The auditor reviewed the training histories for two process technicians. The auditor also reviewed the cyanide awareness and spill prevention refresher training records and examples of weekly meetings to verify that the required refresher training was provided.

Wharf has evaluated the effectiveness of training by both testing and observation. Wharf administers written quizzes to evaluate the effectiveness of the cyanide awareness training. Additionally, following task-specific training, operators work with a group of experienced personnel for several weeks. Supervisors observe and evaluate job performance prior to training approval. As part of the evaluation, process workers also participate in an interview with Wharf's Tech Review Board and must pass a written exam demonstrating knowledge required for the job classification. Wharf has retained records of cyanide training that include the names of the employee and the trainer, training dates, topics covered, and test results demonstrating an understanding of the training. The auditor reviewed examples of completed quizzes and interviewed the Process Manager and the Training Coordinator to verify compliance.

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

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 8.3**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 8.3; train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

Wharf has trained personnel whose tasks involve cyanide with cyanide first aid and response measures as part of the cyanide awareness training and spill prevention training. Personnel has also received task training in the

Procedure for Cyanide Spill Decontamination, which includes procedures for spill containment, neutralization, decontamination, and cleanup. Operators have been trained to stop and contain the release (if safe to do so), remove and decontaminate the victim (if safe to do so), and administer the oxygen. This has also included practical training. The auditor reviewed the training presentations and videos, and training records, as well as interviewed Wharf's Health & Safety Coordinator to verify compliance.

Wharf has provided training to the ERT members in CPR and cyanide first aid, Hazmat and spill control, airway and oxygen, patient assessments, SCBA, confined space, life flight, splinting rescue/ equipment, and others. In addition, emergency response coordinators and ERT members have received annual training on the procedures in the ERP through the required annual cyanide awareness and spill prevention trainings. Also, training in Basics of Incident Command was provided to the SCMT.

Wharf provides refresher training to operators and ERT members through the annual refresher training on cyanide awareness and spill prevention. The ERT members also receive training monthly on various emergency response topics, and each year the topics are repeated. Wharf has retained records of cyanide training and include the names of the employee and the trainer, training dates, topics covered, and test results demonstrating an understanding of the training.

Wharf has made external responders familiar with the elements of the ERP related to cyanide. The primary involvement of external responders in cyanide-related emergencies is ambulance response and administration of the Cyanokit antidote by trained medical professionals and paramedics. Also, local hospitals will provide medical treatment as needed. The Rapid City Hazmat Team and the local Fire Departments would support any emergency response related to evacuation and offsite cyanide transportation incidents as needed. Wharf has provided cyanide response training to the local emergency agencies in December 2019 including local fire department and local hospitals. In 2021, Wharf also invited the local ambulance service (Monument Health) to participate in the October 2021 mock drill. Wharf attends quarterly Lawrence County LEPC meetings. LEPC members include local emergency agency representatives from Lawrence County Emergency Management, Lawrence County Search and Rescue, Spearfish Police Department, Lawrence County Sherriff, South Dakota Highway Patrol, local Fire Departments, Lead/Deadwood Regional Hospital, Spearfish Regional Hospital, Spearfish Ambulance Service, Black Hills Life Flight, and others. During the LEPC meetings, response planning activities are discussed. Wharf sends a copy of their ERP to the LEPC annually. Wharf has made formalized arrangements with three local hospitals: Rapid City Regional Hospital, Lead/Deadwood Regional Hospital, and Spearfish Regional Hospital.

The auditor reviewed training materials and training records for cyanide awareness and spill prevention. The auditor also reviewed copies of the letters sent to the hospitals, records of training to local emergency response agencies, invitation email to local ambulance to participate in the mock drills, and records of LEPC meetings.

PRINCIPLE 9 – DIALOGUE

Engage in Public Consultation and Disclosure

Standard of Practice 9.1: Promote dialogue with stakeholders regarding cyanide management and responsibly address identified concerns.

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 9.1**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 9.1; promote dialogue with stakeholders regarding cyanide management and responsibly address identified concerns.

Wharf has provided stakeholders with information on its cyanide management practices and engaged with them regarding their concerns. This has been accomplished through meetings and presentations to local communities, DENR Board of Minerals and Environment, and Lawrence County, as well as tours of the mine site.

Wharf provides annual mining update presentations to the DENR Board of Minerals and Environment and to the Lawrence County Commissioners, which are open to the public. During these presentations, Wharf provides an update on their production, projects, reclamation activities, spill information, and Code certification. Also, Wharf attends quarterly Lawrence County LEPC meetings and annual meetings with the TVLA, representing the residential community located closest to the Wharf Mine. During these meetings, response planning activities and operations-related questions and/or concerns are discussed.

In addition, Wharf has offered tours of the mine facilities, including the cyanide facilities in 2019 and 2020. The auditor reviewed meeting and tour records and interviewed environmental personnel to verify compliance.

Standard of Practice 9.2: Make appropriate operational and environmental information regarding cyanide available to stakeholders.

☒ **in full compliance with**

The operation is

☐ in substantial compliance with **Standard of Practice 9.2**

☐ not in compliance with

Summarize the basis for this finding:

The operation is in full compliance with Standard of Practice 9.2; make appropriate operational and environmental information regarding cyanide available to stakeholders.

Wharf has developed written descriptions of how their activities are conducted and how cyanide is managed, and these descriptions have been made available to communities and other stakeholders. These descriptions are available on the Coeur website. Information on the operation has also been included in the presentations to Lawrence County and DENR Board of Minerals and Environment, which are open to the public.

According to the United States Census Bureau, the population in the mine area is largely literate. Nonetheless, Wharf disseminates information in verbal form via a video of the operations (available on Coeur website), open meetings, presentations, and tours.

The auditor reviewed the Coeur website and the annual presentations to Lawrence County and DENR Board of Minerals and Environment to verify compliance.

Wharf makes information publicly available on cyanide exposures and releases. Federal regulations require that Wharf report accidents and fatalities to MSHA within certain time limits depending on the nature of incident, which would include cyanide hospitalizations and fatalities. This information would be available to the public via the MSHA website. Wharf indicated that no cyanide-related exposures requiring hospitalization or fatalities occurred during this audit cycle. Wharf personnel also indicated that DENR requires reporting of process solution outside of containment, regardless of the amount. At the time of the audit, Wharf had experienced three on-site process solution spills outside of containment. Wharf provided the spill reports for these incidents. These reports submitted to DENR became public information. The auditor reviewed the spill reports submitted to DENR and interviewed environmental personnel to verify compliance.

Signature Page

Golder Associates USA Inc.

Ivon Aguinaga
Lead Auditor / Mining Technical Specialist

IA/mb

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