



Lahontan Regional Water Quality Control Board

March 1, 2021

WDID No. 6B159708001

TO: ATTACHED MAILING LIST

Revised Waste Discharge Requirements for Golden Queen Mining Company, LLC and the U.S. Department of the Interior, Bureau of Land Management, Soledad Mountain Project, Kern County

Enclosed are tentative Revised Waste Discharge Requirements for the subject line facility, located in Kern County. The Lahontan Regional Water Quality Control Board (Water Board) requests that you review the enclosed documents and provide us with your written comments no later than **April 2, 2021**. Please send your comments to the Water Board's email address at Lahontan@waterboards.ca.gov and include **Golden Queen Mining Company, LLC, Soledad Mountain Project WDID No. 6B159708001 Comments** in the subject line text. If you do not have access to the internet, you may mail your comments to the Water Board's Victorville office at the address shown on this letter to the attention of Christina Guerra.

The Water Board will consider adopting the Revised Waste Discharge Requirements at its regular meeting scheduled for May 12, 2021 in Bishop, California (virtual). As required by the California Code of Regulations, title 27, section 21730, notice of the meeting and the enclosed documents are being circulated not less than 45 days before the scheduled meeting. You can view the Water Board's meeting agenda 10 days before the meeting on our web site at: www.waterboards.ca.gov/lahontan (click on Agenda). If you need further information regarding this meeting, please contact our office at (760) 241-6583.

If you need further information regarding this agenda item, please contact Christina Guerra at (760) 241-7333 or at christina.guerra@waterboards.ca.gov or Jan Zimmerman at (760) 241-7376 or jan.zimmerman@waterboards.ca.gov.

Angelica Soto
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Enc: Tentative Revised Waste Discharge Requirements and Monitoring and Reporting Program for the Golden Queen Mining Company, LLC, Soledad Mountain Project

PETER C. PUMPHREY, CHAIR | MICHAEL R. PLAZIAK, EXECUTIVE OFFICER

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION**

**BOARD ORDER NO. R6V-2021-TENTATIVE
WDID NO. 6B159708001**

REVISED WASTE DISCHARGE REQUIREMENTS

FOR

**GOLDEN QUEEN MINING COMPANY, LLC. AND
THE U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT
SOLEDAD MOUNTAIN PROJECT**

Kern County

The California Regional Water Quality Control Board, Lahontan Region (Water Board) finds:

1. Discharger

Golden Queen Mining Co., LLC. (Golden Queen [Owner, Landowner, and Operator]), and the U.S. Department of the Interior, Bureau of Land Management BLM (BLM [Landowner]) are collectively referred to as the "Discharger. The Soledad Mountain Project (Facility) is located on private land (fee land and patented lode mining claims and millsites) and federal land (unpatented lode mining claims and millsites) administered by the BLM, as shown on Attachment A of this Board Order (Order).

2. Location

The Facility is located approximately two miles west of State Highway 14 on the south side of Silver Queen Road, and five miles south of the town of Mojave, in Kern County within: (1) Sections 31 and 32, Township (T) 11 North (N), Range (R) 12 West (W), San Bernardino Base and Meridian (SBB&M); (2) Sections 5, 6, 7, 8, and 18, T10N, R12W, SBB&M; and, (3) Sections 1 and 12, T10N, R13W, SBB&M. Attachment A of this Order shows the Facility location.

3. Facility

The Soledad Mountain Project is a gold and silver mine that consists of open pits, a pad for the location of the aggregate production facilities and a stockpile of quality waste rock, ore stockpiles, a crushing and screening plant, heap leach facility, precious metals recovery plant, stormwater management facilities, ancillary facilities (e.g., workshop, warehouse, offices, assay laboratory, fuel storage, and utilities infrastructure), and growth media stockpiles. The heap leach facility consists of the facilities that receive ore for leaching with dilute sodium cyanide (NaCN) solution, which include two heap leach pads (Phase 1 pad and Phase 2 pad), and the facilities that convey and receive NaCN solution, which include the drainage collection channels and two surface impoundments. For the

purposes of this Order, the Soledad Mountain Project is referred to as the "Facility." Attachment B of this Order presents the general site layout.

4. Reason for Action

This Order is being issued to update and revise the Waste Discharge Requirement (WDRs) to reflect existing Facility conditions, require the installation of additional groundwater monitoring wells to establish an adequate groundwater monitoring network, general updates to the Order and Monitoring and Reporting Program (MRP), and to be consistent with California Code of Regulations, title 27.

5. Order History

- a. On March 5, 1998, the Water Board adopted Board Order No. 6-98-009, establishing WDRs for construction and operation of the Facility. Although the WDRs were issued, Golden Queen did not construct or operate the mine.
- b. On July 14, 2010, the Water Board adopted Board Order No. R6V-2010-0031, establishing revised WDRs for the construction and operation of the Facility and rescinding Board Order No. 6-98-009.

6. Land Uses

Within the proximity of the Facility, other land uses include undeveloped public land owned by the BLM with remnants of historical precious metal mining operations, industrial including renewable energy facilities, and residential. Several single-family homes located adjacent to the Facility are owned by the Discharger and used for office space and employee housing.

7. Site Topography

Soledad Mountain, a volcanic peak approximately three miles in diameter, is a major topographic landmark in the area with steep slopes and minimal soil cover at the middle and upper elevations. Alluvium and colluvium cover the lower slopes, which grade down towards the valley floor. Elevations range from 4,190 feet above mean sea level (MSL) at the summit of Soledad Mountain to approximately 2,700 feet above MSL along Silver Queen Road.

8. Climate

The area typically has hot summers, with temperatures higher than 100 degrees Fahrenheit (°F), and mild winters, with temperatures ranging from 30 to 60°F. The mean annual precipitation rate is 6.33 inches, and the mean annual evaporation rate is approximately, 80 inches. The maximum expected 100-year, 24-hour storm precipitation is 4 inches.

9. Site Geology

The site is in the Western Mojave Geomorphic Province of Southern California and is of Middle to Late Miocene in age. The Mojave Desert is a wedge-shaped fault block, which is separated from the Sierra Nevada Mountains to the north by the Garlock Fault Zone and from the Transverse Ranges and central coastal areas to the southwest by the San Andreas Fault Zone. The rock types of the western Mojave Desert have been grouped into three main divisions (Dibblee, 1967) as the pre-Tertiary age crystalline rocks, the Tertiary age sedimentary and volcanic rocks, and the Quaternary age sediments and local basalt flows.

Soledad Mountain is an eroded silicic volcanic center of Middle to Late Miocene age (21.5 million to 16.9 million years). The volcanic rocks consist of felsic flows, tuffs, and breccias of the Gem Hill formation with rock types ranging from quartz latite to rhyolite. The flanks of Soledad Mountain are mantled by Quaternary alluvium deposits consisting of sandstones and conglomerates. High-grade precious metals mineralization is associated with steeply dipping, epithermal veins occupying faults and fracture zones that crosscut rock units and generally trend towards the northwest. Surrounding these zones are siliceous envelopes that contain lower grade material that forms the bulk of the mineral resource.

Soils are comprised of interbedded alluvial fan deposits of sand, sandy gravel, silty sand, and clayey sand. The uppermost geologic unit at this location is a Quaternary colluvium with an upper layer of Arizo soil. The Arizo soil is a sandy loam with 40 percent gravel and 50 percent gravel and cobbles with depth. It varies in thickness from less than one inch to 24 inches in the area of the heap leach pad. The depth to bedrock ranges from 100 feet in the upslope area of the heap leach pad to approximately 260 feet at the toe of the heap leach pad.

10. Site Hydrology and Hydrogeology

The Facility is located in the Antelope Hydrologic Unit. There are no surface waters in the immediate vicinity of the Facility. The nearest intermittent stream is located approximately three miles to the west of Soledad Mountain and there are no springs or perennial streams within one mile of the Facility.

The Facility is located within the Fremont Valley groundwater basin. Groundwater recharge is primarily from the San Gabriel and Tehachapi mountains. The dominant regional flow of groundwater in the basin north and east of Soledad Mountain is easterly. The groundwater flow direction west and south of Soledad Mountain is southerly. Groundwater flow paths bifurcate around the low-permeability mass of Soledad Mountain. East of Soledad Mountain, groundwater flows toward Koehn Lake. As groundwater flows from west to east, faults and bedrock outcrops act as barriers to groundwater flow, contributing to the irregularly shaped groundwater basin and sub-basin boundaries.

The groundwater gradient is generally flat and at the Facility is about 0.002 feet per foot in a northwesterly direction. Depth to groundwater ranges from 200 to 250 feet in wells located around the Facility.

11. Groundwater Quality

Groundwater samples representative of background water quality were collected by the Discharger from groundwater monitoring well MW-6 in January 2019, October 2019, and July 9, 2020. Selected results are presented in Table 1, Groundwater Quality Results.

Table 1. Groundwater Quality Results

Constituent	Units	Monitoring Well MW-06 Sample Concentration	Date Sampled	Maximum Contaminate Level (MCL)
Arsenic	mg/L	0.011	7/9/2020	0.01
Chloride	mg/L	8.2	1/22/2019	250 ¹
Copper	mg/L	<0.0050	10/15/2019	1.3
Electrical Conductivity	µmhos/cm	0.533	7/9/2020	900 ¹
Iron	mg/L	<0.030	10/15/2019	0.3 ¹
Lead	mg/L	<0.0010	10/15/2019	15
Mercury	mg/L	<0.00020	10/15/2019	NE
Nitrate as Nitrogen	mg/L	0.62	1/22/2019	10
Total Cyanide	mg/L	<0.0050	7/9/2020	150
pH	pH units	8.24	7/9/2020	6.5-8.5
Sulfate	mg/L	120	1/22/2019	NE
Total Dissolved Solids	mg/L	360	7/9/2020	500 ¹
WAD Cyanide	mg/L	<0.010	7/9/2020	NE

Notes:

¹Secondary MCL

MCL = maximum contaminant level

µmhos/cm = micromhos per centimeter

WAD = weak acid dissociable

mg/L = milligrams per

MW = monitoring well

µg/L = micrograms per liter

NE = not established

12. Water Sources

On-site production wells PW-1 and PW-4 owned by the Discharger provide the water used at the Facility. Selected results from groundwater samples collected by the Discharger from supply well PW-1 in February 2017, February 2018, and September 2020; and supply well PW-4 in February 2017, September 2018, and September 2020 are shown in Table 2.

Table 2. Water Supply Quality Results

Supply Well	Constituent	Units	Concentration	Date Sampled	MCL
PW-1	Arsenic	mg/L	0.066	9/9/2020	0.01
	Chloride	mg/L	11	2/28/2017	250 ¹
	Fluoride	mg/L	0.23	2/7/2018	2
	MBAS	mg/L	ND	2/28/2017	500 ¹
	Mercury	µg/L	<0.20	2/7/2018	2
	Nitrate as Nitrogen	mg/L	.64	2/5/2020	10
	pH	pH units	7.30	2/28/2017	6.5-8.5
	Specific Conductance	µmhos/cm	535	2/28/2017	900 ¹
	Sulfate	mg/L	140	2/28/2017	250 ¹
	Total Cyanide	µg/L	ND	2/28/2017	150
	Total Dissolved Solids	mg/L	380	2/28/2017	500 ¹
	WAD Cyanide	mg/L	ND	2/28/2017	NE
PW-4	Arsenic	mg/L	0.0037	9/14/2020	0.01
	Chloride	mg/L	29	2/28/2017	250 ¹
	Fluoride	mg/L	0.18	9/5/2018	2
	MBAS	mg/L	ND	2/28/2017	500 ¹
	Mercury	µg/L	<0.20	9/5/2018	2
	Nitrate as Nitrogen	mg/L	2.9	9/14/2020	10
	pH	pH units	7.19	2/28/2017	6.5-8.5
	Specific Conductance	µmhos/cm	636	2/28/2017	900 ¹
	Sulfate	mg/L	65	2/28/2017	250 ¹
	Total Cyanide	µg/L	ND	2/28/2017	150
	Total Dissolved Solids	mg/L	420	2/28/2017	500 ¹
	WAD Cyanide	mg/L	ND	2/28/2017	NE

Notes:

¹ = Secondary MCL

WAD = weak acid dissociable

MCL = maximum contaminant level

µg/L = micrograms per liter

MBAS = methylene blue active substances

µmhos/cm = micromhos per centimeter

mg/L = milligrams per liter

ND = not detected

NE = not established

13. Waste Generating Processes

The current Life-of-Mine design incorporates three primary general open pit targets within the overall open pit boundary. The open pit targets are the Northwest Pit, the Main Pit, and the East Pit. Excavation is expected to continue until approximately 2031, or a total period of approximately 15 years. The current projections for Life-of-Mine excavation include producing approximately 59 million tons of gold and silver ore and 264 million tons of overburden and interburden material (20 million tons of saleable aggregate material, and 244 million tons of surplus material). Up to 4.7 million tons of ore and 19 million

tons of surplus overburden and interburden are expected to be produced annually. It is expected that overburden and interburden material and/or leached and rinsed residues will be sold as aggregate and construction materials over a 40-year period ending in 2061; any remaining materials on site will be managed during closure and post-closure.

Heap leaching is the primary methodology used to treat the processed ore. The heap leaching operation consists of the facilities that receive and store ore for leaching with diluted NaCN solution, including the heap leach pads, the solution conveyance channel, the concrete pump box, and the overflow ponds. The Phase 1 and Phase 2 (not yet constructed) heap leach pads are designed to contain approximately 51.2 million tons and 25 million tons of ore, respectively, with a projected heap height of 200 feet.

A NaCN solution (barren process solution) with cyanide concentrations ranging from 150 to 500 mg/L and pH values between 10 and 11 are applied to the ore via drip emitters at the design flow rate of approximately 6,000 gallons per minute (gpm) and an application rate of 0.004 to 0.005 gpm per square foot. The barren process solution percolates through the ore on the heap to dissolve the precious metals. The pregnant solution (gold and silver in solution) is collected at the base of the heap in the solution collection pipes and drains to the toe of the heap. Pregnant solution flows to the pump box and then into the Merrill-Crowe plant or West Overflow Pond section in one of the two pipes contained within the double-lined solution conveyance channel. The quality of the wastewater in the pregnant solution and barren solution is shown in Attachment C, Waste Characterization Sample Results.

The metals in the pregnant solution are then recovered by precipitation with zinc or adsorption on activated carbon. The zinc precipitation process, referred to as the Merrill-Crowe process, is used to recover gold and silver when the silver to gold ratio is greater than 10 to 1, which is the case for the Facility.

The Merrill-Crowe process precipitates the suspended solids and dissolved oxygen from the pregnant solution in order to make the zinc precipitation more efficient. Gold and silver are precipitated as micron-sized particles of metallic gold and silver. Following the precipitation process, all subsequent processing takes place in the refinery.

In the refinery, the pregnant solution is pumped through plate and frame filters to remove the gold and silver particles, at which point the solution is termed "barren." The barren solution flows to the barren tank and is returned to the heap leach pad. The precipitate is removed manually and stored in pans.

The ore contains nominal concentrations of mercury. Therefore, any mercury leached from the ore is precipitated with the gold and silver. A mercury retort is used to remove it from the precipitate sludge by heating to volatilization. Water

vapor and mercury are condensed and collected in the retort condensing system and the mercury is drained from the system and stored in flasks for eventual offsite removal and/or disposal.

14. Waste Management Unit and Authorized Disposal Sites

The heap leach pads, two surface impoundments (East Overflow Pond and the West Overflow Pond), and overburden waste piles are the waste management units (WMUs) for the treatment, storage, and disposal of mining waste, as defined in California Code of Regulations (CCR), title 27, section 22470.

The heap leach pads and surface impoundments are the only authorized disposal sites for the collection of process solution (wastewater) within the Facility boundary.

15. Waste Classification

The mining waste is classified pursuant to CCR, title 27, section 22480. The crushed ore on the heap leach pad and the process solution are both classified as Group B mining wastes; the waste rock is classified as a Group C mining waste.

Group B mining waste is defined in CCR, title 27, section 22480, subsection (2)(B) as mining wastes that consist of or contain nonhazardous soluble pollutants of concentrations that exceed water quality objectives or could cause degradation of waters of the state. Group C mining waste is defined in CCR, title 27, section 22480, subsection (2)(3) as wastes from which any discharge would be in compliance with the applicable water quality control plan, including water quality objectives other than turbidity.

16. Description of Waste Management Units

a. Heap Leach Pads

The Phase 1 heap leach pad is approximately 165 acres (with the three stages constructed) and consists of a single composite liner (i.e., a geomembrane in direct contact with an underlying soil liner) and was constructed with the following engineered alternative liner system, from bottom to top:

1. Prepared subgrade, reworked and compacted in place;
2. A 12-inch thick soil liner constructed from historical tailings and native soils amended with bentonite, historical tailings amended with native clayey soils, or suitable native or imported clayey soils which also may be amended with bentonite if required, with a permeability of 1×10^{-6} centimeters per second (cm/sec);

3. 80-mil thick liner, low-density polyethylene (LDPE) geomembrane with wick drains that acts as the Leachate Collection and Recovery System (LCRS); and
4. Process solution collection drainage layer, consisting of competent ore or waste rock crushed to minus 1.5-inch, is provided as a cushion to protect the underlying geomembrane from damage when crushed ore is stockpiled on the pads and to augment solution collection.

The hydraulic head above the liner is minimized via internal solution collection pipes placed on the geomembrane and within the drainage layer, and by site grading; both designed to encourage positive drainage. Additionally, the liner design incorporates a leak detection and collection system and vadose zone monitoring system along the downgradient toe of the heap leach pad.

The Phase 2 heap leach pad is not yet constructed and is planned to be constructed similarly to Phase 1. The design of Phase 2 must comply with the requirements specified in this Order. A detailed design report/plan will be submitted to the Water Board **a minimum of 120 days** prior to start of construction, as specified in this Order, Section IV.G.

b. Solution Collection Channel

A double-lined solution collection and conveyance channel runs along the northern edge of the Phase 1 heap leach pad. Process solutions collected in the leach pad pipe network are conveyed to the pump box by gravity flow in 18-inch diameter high-density polyethylene (HDPE) pipes that lie in the lined channel. The lined channel therefore provides a second level of containment. The solution conveyance channel liner system consists of the following components, from bottom to top:

1. 12-inch thick soil liner with a maximum permeability of 1×10^{-6} cm/sec;
2. 60-mil HDPE secondary geomembrane;
3. Geonet, the LCRS drainage later; and
4. 80-mil HDPE primary geomembrane.

c. Surface Impoundments and Pump Box

The surface impoundments consist of the East and West Overflow Ponds and pump box, and is a connected system. The East and West Overflow Ponds are divided with a central berm. The primary operating pond is the

West Overflow Pond and the East Overflow Pond is the excess flow pond to allow for operational efficiency. The pump box collects solutions from the heap leach pad via gravity. Any overflow from the pump box is routed to the West Overflow Pond. The pump box is a concrete box structure divided into two compartments via a low internal wall and set in a lined sump. One compartment receives solution from the pad and the other serves as the location of the pumps moving solution to the precious-metal recovery facility (Merrill-Crowe Plant). The total capacity of the pump box is approximately 60,000 gallons.

The liner system for the pump box area consists of the following components, from the bottom to top:

1. 12-inch thick concrete;
2. 60-mil HDPE geomembrane;
3. Geonet; and
4. 60-mil HDPE geomembrane.

The composite liner design for the East and West Overflow Ponds consists of a double synthetic liner with an integrated LCRS (LD-6 and LD-7). The pond liner system consists of the following components from the bottom to top:

1. 12-inch thick soil liner with a maximum permeability of 1×10^{-6} cm/sec;
2. 60-mil HDPE lower secondary geomembrane;
3. Highly transmissive HDPE geonet LCRS drainage layer; and
4. 80-mil HDPE upper primary geomembrane.

d. Waste Rock Piles

Mined material otherwise not used in the production of gold, silver, or construction aggregates will be permanently placed onsite. The rock mined to expose ore will be placed at its angle of repose with final composite slopes not to exceed 2H:1V (horizontal to vertical), in mined-out phases of the open pits or placed in designated areas in accordance with the Facility's approved Reclamation Plan.

17. Engineered Alternative to Prescriptive Standard for the Waste Management Units

CCR, title 27, includes prescriptive standards for waste management unit construction and allows for engineered alternatives to such standards. The Discharger constructed engineered alternatives to the CCR, title 27 prescriptive standards for the construction of the Class II waste piles (heap leach pad, solution conveyance channel) and surface impoundments. CCR, title 27, section 20080, subdivision (b), requires that alternatives shall only be approved where the Discharger demonstrates that: (1) the construction of prescriptive standard is not feasible because it is unreasonably and unnecessarily burdensome and will cost substantially more than alternatives, which meet the criteria, or is impractical and will not promote attainment of applicable performance standards; and (2) there is a specific engineered alternative that is consistent with the performance goal of the prescriptive standard and affords equivalent protection against water quality impairment.

The prescriptive standard for a waste pile is a single clay liner and for a surface impoundment either a single clay liner or a double clay liner system with a LCRS, the clay liner having a hydraulic conductivity of at least 1×10^{-6} cm/sec. The Discharger constructed engineered alternative soil liners for the waste piles and surface impoundments because construction of the prescriptive clay liner was not feasible at this Facility. These engineered alternative liner systems were previously approved with the adoption of Board Order No. R6V-2010-0031.

18. Action Leakage Rates

The Discharger has requested that the Water Board allow an action leakage rate (ALR) of liquid through the upper liner of the surface impoundments into the leachate collection sumps. The respective ALRs are based on proposed design dimensions and design specifications of the surface impoundments and on a 1992, United States Environmental Protection Agency (USEPA) guidance document, *Action Leakage Rates for Leak Detection Systems, Supplemental Background Document for the Final Double Liners and Leak Detection Systems Rule for Hazardous Waste Landfills, Waste Piles, and Surface Impoundments*. The ALRs are specified in the MRP and include the requirements for monitoring and reporting leakage rates into the LCRS. The requirements also describe the response actions for the Discharger if the ALRs are exceeded.

19. Water Quality Protection Standard

The Water Quality Protection Standard (WQPS) consists of monitoring parameters, constituents of concern (COCs), concentration limits, monitoring points, and the point of compliance. The WQPS applies over the active life of the Facility, closure period, post closure maintenance period, and the compliance period. The COCs, monitoring points, and point of compliance for groundwater

and unsaturated zone monitoring are described in MRP No. R6V-2021-TENTATIVE.

20. Compliance Period

The compliance period is the number of years equal to the active life of the WMU plus the closure period, any post-closure monitoring and maintenance period until the Water Board finds that the Facility no longer poses a threat to water quality. The compliance period is the minimum period during which the Discharger must conduct a water quality monitoring program subsequent to a release. The compliance period must begin anew each time the Discharger initiates an EMP. If the discharger is engaged in a corrective action program at the scheduled end of the compliance period, the compliance period shall be extended until the Discharger can demonstrate that the WMU has been in continuous compliance with its WQPS for a period of three years as specified in CCR, title 27, section 20410(c).

21. Detection Monitoring Program

Pursuant to CCR, title 27, section 22500, the Discharger must implement a DMP for the Facility as specified in CCR, title 27, sections 20385 and 20420. The DMP for the Facility consists of monitoring groundwater and the unsaturated zone for the presence of COCs. The DMP is specified in MRP No. R6V-2021-TENTATIVE.

Pursuant to CCR, title 27, section 20415(b)(B)(1), the Discharger must install a sufficient number of monitoring points downgradient of the WMU, at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that represents the quality of water passing the point of compliance and to allow for the earliest possible detection of a release from the WMU. Groundwater monitoring well MW-4 was installed to monitor groundwater downgradient of the surface impoundments but has been dry since installation and needs to be replaced. Additionally, several existing monitoring wells are located at distances greater than 1,800 feet apart and may not be adequately spaced to monitor downgradient of the point of compliance of the Phase 1 heap leach pad. This Order requires the Discharger to submit a work plan for the installation of additional monitoring wells, at appropriate locations, to adequately monitor the point of compliance downgradient of the WMUs.

22. Evaluation Monitoring Program

Pursuant to CCR, title 27, section 22500, an EMP may be required, as specified in CCR, title 27, sections 20385 and 20420(k)(6), whenever there is “measurably significant” evidence of a release from the Facility during a DMP or whenever there is significant physical evidence of a release from the Facility. The EMP requires the Discharger to delineate the nature and extent of the release and

develop a suite of proposed corrective action measures within 90 days of establishing an EMP, unless the Discharger proposes and substantiates a longer time period for implementing the EMP. If the EMP confirms measurably significant evidence of a release or significant physical evidence of a release, then the Discharger needs to submit an Engineering Feasibility Study for corrective action pursuant to CCR, title 27, section 20425, subdivision (b), and MRP No. R6V-2021-TENTATIVE.

23. Corrective Action Program

Pursuant to CCR, title 27, section 22500, a corrective action program (CAP) to remediate released wastes from the Facility may be required as specified in CCR, title 27, sections 20385 and 20430, if results of an EMP confirm measurably significant evidence of a release or significant physical evidence of a release from the Facility.

24. Known or Reasonably Foreseeable Release

The Discharger is required to provide financial assurance for corrective action of a known or reasonably foreseeable release as specified in CCR, title 27, section 20080(a)(1). A known or reasonably foreseeable release plan was previously submitted for this Facility. The Discharger is required to update this plan if/when there is a substantial change in operations or in site conditions. At minimum, the plan must (1) describe those actions necessary to initiate and complete corrective action for a known or reasonably foreseeable release from the Facility, and (2) include a detailed cost estimate of the costs to carry out the actions necessary to perform the corrective action activities identified.

25. Closure and Post Closure Maintenance Plan

The Discharger submitted a revised Preliminary Closure and Post-Closure Maintenance Plan on December 6, 2019, in accordance with CCR, title 27, sections 21400 and 22510. The plan includes estimates to carry out the proposed closure and post-closure monitoring and maintenance activities at the Facility. The Discharger proposes clean closure of the surface impoundments, pursuant to CCR, title 27, section 21400, subdivision (b)(1). Once all fluids have been evaporated from the ponds, all residual solids will be disposed of off-site at an appropriate disposal facility in accordance with applicable regulations. The cleaned liner of the ponds will be folded onto themselves, punctured, and buried in place with clean soil. The perimeter berms will be regraded to match the surrounding grades. Transfer pipelines will be removed, salvaged, or disposed of offsite. The ore material on the heap leach pad will be neutralized. Neutralization will be complete when total cyanide and WAD cyanide detected in the heap materials meet regulatory limits and approved by the Water Board in Closure WDRs. Final regrading/slopes, and revegetation for the heap leach piles, filling of

the solution conveyance channel, and slopes of the waste rock piles will be in accordance with the Kern County approved Reclamation Plan.

26. Financial Assurance

The Discharger needs to obtain and maintain financial instruments for closure, post-closure maintenance and monitoring, and for corrective action of a known or reasonably foreseeable release as required under CCR, title 27, sections 22207, 22212, 22510(f), 22510(g), and 20080(a)(1).

The Discharger needs to report the amount of money available in the funds as part of the annual self-monitoring report and demonstrate in an annual report that the amount of financial assurance is adequate and to increase the amount of financial assurance, as appropriate, for inflation.

27. Storm Water

The Facility is located in the Antelope Valley. A Notice of Non-Applicability for the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Dischargers Associated with Industrial Activities, NPDES No. CAS000001, Statewide Industrial General Permit, Order No. 2014-0057-DWQ, as amended, was approved in December 2015 on the basis that the site does not discharge storm water to a water of the U.S.

Storm water protection at the Facility is primarily accomplished through drainage controls. Structural and non-structural Best Management Practices (BMPs) are implemented for protection from run-on and to manage run-off to minimize erosion, sedimentation, and off-site migration. This Order requires prohibitions, limitations, and provisions for storm water and non-storm water discharges at the Facility to protect both groundwater and surface water quality.

28. Basin Plan

The Water Board adopted a *Water Quality Control Plan for the Lahontan Region* (Basin Plan), which became effective on March 31, 1995. This Order implements the Basin Plan, as amended.

29. Receiving Waters

The receiving waters are minor surface waters within the Chafee and Gloster Hydraulic Areas (626.10 and 626.20, respectively) of the Antelope Hydrologic Unit (626.00) and groundwaters within the Fremont Valley Groundwater Basin (Department of Water Resources, Groundwater Basin Number 6-46, Basin Plan, Plate 2B).

30. Beneficial Uses

The present and potential beneficial uses of groundwaters of the Fremont Valley Groundwater Basin, as set forth and defined in the Basin Plan, are:

- a. Municipal and domestic supply (MUN);
- b. Agricultural Supply (AGR);
- c. Industrial service (IND); and
- d. Freshwater Replenishment (FRSH).

The present and probable beneficial uses of minor surface waters of the Chafee and Gloster Hydrologic Areas, as set forth and defined in the Basin Plan are:

- a. Municipal and Domestic Supply (MUN);
- b. Agricultural Supply (AGR);
- c. Groundwater Recharge (GWR);
- d. Water Contact Recreation (REC-1);
- e. Non-contact Water Recreation (REC-2);
- f. Commercial and Sportfishing (COMM);
- g. Warm Freshwater Habitat (WARM);
- h. Cold Water Habitat (COLD); and
- i. Wildlife Habitat (WILD).

31. Statistical and Non-Statistical Methods

Statistical and non-statistical analyses of monitoring data are necessary for the earliest possible detection of a release of waste from the Facility. CCR, title 27, section 20415, subdivision (e)(7), requires statistical data analyses to determine when there is "measurably significant" evidence of a release from the Facility. CCR, title 27, section 20415, subdivision (e)(8) allows non-statistical data analysis methods that can achieve the goal of the monitoring program at least as well as the most appropriate statistical method. The monitoring parameters listed in MRP No. R6V-2021-TENTATIVE are believed to be the best indicators of a release from the Facility.

32. Discharge of Monitoring Well Purge Water

As part of the regularly scheduled groundwater sampling events, groundwater monitoring wells are purged until parameters of electrical conductivity, pH, and temperature are sufficiently stabilized to assure the collection of a representative sample. Purged groundwater is currently discharged to the ground on-site and allowed to evaporate. To protect surface waters and groundwater, the discharge to the ground of purge water is prohibited from containing concentrations of COCs and monitoring parameters, which exceed the WQPS, as described in MRP No. R6V-2021-TENTATIVE.

33. Waste Management Strategy

The Water Board has determined that the proposed mining waste discharge is consistent with a waste management strategy that prevents the pollution or contamination of the waters of the state, particularly after closure of any waste management unit for mining waste.

34. California Climate Change Mitigation Strategy

The Water Board adopted Resolution No. R6T-2019-0277 that addresses the impacts of climate change. The four protection strategies stated in the resolution are addressed by this Board Order as stated below:

- a. Protection of Wetlands, Floodplains and Headwaters - *Support external efforts and initiate necessary regulatory actions to facilitate improved meadow, wetland, and floodplain conditions and stream flows in headwater areas to achieve greater levels of watershed resiliency.*

This Board Order has no effect on wetlands, floodplains, and headwaters protection.

- b. Infrastructure Protection - *Support external efforts and initiate necessary regulatory actions to help build and maintain sustainably functioning infrastructure so built systems remain safe and reliable during extreme weather events including heat waves, extreme precipitation, severe droughts, and wildfires.*

Infrastructure associated with this Facility is well protected beneath the ground surface and likely will not be affected during extreme weather events.

- c. Protection of Groundwater Quality and Supply - *Support external efforts and initiate necessary regulatory actions to protect groundwater quality and improve groundwater recharge for purposes of protecting source water and building sustainability and drought resiliency.*

This Board Order requires the construction, maintenance, and proper operation of waste management units, to ensure waste containment; and a detection groundwater monitoring program to monitor and detect groundwater degradation and/or pollution, providing the best assurance for an early detection of any releases from the Facility.

- d. Protection of Headwater Forests and Promoting Fire Resiliency - *Support external efforts and initiate necessary regulatory actions to facilitate the pace and scale of projects implemented to build long-term resilience of headwater forests including those that (1) reduce*

vulnerability to catastrophic fires and pest infestations, and (2) support resilience in recovery efforts.

This Board Order has no effect on protecting headwater forests or promoting fire resiliency.

35. California Water Code, Section 13241 Considerations

Pursuant to CWC, section 13241, the requirements of this Order take into consideration:

- a. Past, present, and probable future beneficial uses of water. This Order identifies existing groundwater quality and past, present, and probable future beneficial uses of water, as described in Finding Nos. 11 and 29, respectively. The proposed discharge will not adversely affect present or probable future beneficial uses of water including municipal and domestic supply, agricultural supply, industrial service supply, and freshwater replenishment, because the discharge is authorized only to lined WMUs and this Order requires monitoring to detect any impacts to water quality.
- b. Environmental characteristics of the hydrographic unit under consideration including the quality of water available thereto. Finding No. 11 describes the environmental characteristics and quality of water available.
- c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area. There are no other industries or activities in the area of the project that would be factors that affect water quality in the area. The Water Board will use its existing authority and this Order to ensure protection of water quality from discharges. Compliance with the requirements of this Order is not expected to affect surface water or groundwater quality.
- d. Economic considerations. Water Quality Objectives (WQOs) established in the Basin Plan for the Fremont Valley Groundwater Basin do not subject the Discharger to economic disadvantage as compared to other similar discharges in the Region. This Order will require the Discharger to submit proposals compliant with the requirements of CCR, title 27.
- e. The need for developing housing within the region. The Discharger is not responsible for developing housing within the region. This Order provides for the capacity to collect, store, and evaporate wastewater in lined waste management units.

36. Human Right to Safe, Clean, Affordable, and Accessible Water

CWC, section 106.3, establishes a state policy that every human being has the right to safe, clean, affordable, and accessible water adequate for human

consumption, cooking, and sanitary purposes and directs state agencies to consider this policy when adopting regulations pertinent to those uses of water. Requirements in this Order for drainage controls, monitoring to assess water quality, and corrective action to address impacts to water quality will further promote this policy.

37. California Environmental Quality Act (CEQA) Compliance

The Board of Supervisors of the County of Kern certified, as required by Section 15090 of the State CEQA Guidelines, an Environmental Impact Report (EIR) for the Facility on September 8, 1997, Supplemental EIR on April 8, 2010, and Addendum to Supplemental EIR on August 13, 2020, following public review and comment. The Water Board, acting as a CEQA Responsible Agency in compliance with the CCR, title 14, section 15050, subdivision (b), reviewed and considered the information contained in the EIR, Supplemental EIR, and the Addendum to Supplement EIR.

38. Antidegradation Analysis

State Water Resources Control Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintenance of High Quality Waters in California") requires that whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality must be maintained. Any change in the existing high quality is allowed by that policy only if it has been demonstrated to the Regional Water Board that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies. The policy further requires that Dischargers meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and that the highest water quality consistent with maximum benefit to the people of the state will be maintained.

Adequate liner systems, which comply with CCR, title 27 requirements, are needed to prevent an unauthorized release to groundwater and this WDR is expected to prevent degradation of water quality as a result of waste discharges. A monitoring and maintenance program is needed to ensure that waste discharges are contained within the WMUs at the Facility. As a result, degradation is not expected.

39. Technical and Monitoring Reports

CWC, section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharge or discharging, or

who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of having discharged or discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.”

Technical reports are necessary to assure compliance with this Order and to assess any water quality impacts due to discharges from the Facility. Therefore, the burden, including costs, of these reports bears a reasonable relationship to the need for the report and the benefits to be obtained from the reports.

40. Right to Petition

Any person aggrieved by this action of the Water Board may petition the State Water Board to review the action in accordance with California Water Code, section 13320, and CCR, title 23, sections 2050 et. seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the internet at http://www.waterboards.ca.gov/public_notices/petitions/water_quality, or will be provided in hard copy or electronic format upon request.

41. Notification of Interested Parties

The Water Board notified the Discharger and interested agencies and persons of its intent to adopt revised WDRs for the authorized discharge of wastes to the surface impoundments and has provided them with an opportunity to submit their written views and recommendations.

42. Consideration of Interested Parties

The Water Board, in a public meeting held on May 12, 2021, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to California Water Code, sections 13263 and 13267, that the Discharger shall comply with the following:

I. RECEIVING WATER LIMITATIONS

The discharge must not cause the existing water quality to be degraded nor shall the discharge cause a violation of any applicable water quality standard.

- A. Under no circumstances shall the discharge cause the presence of the following substances or conditions in groundwaters of the Fremont Valley Groundwater Basin.
1. Bacteria – Groundwaters designated as MUN, the median concentration of coliform organisms, over any seven-day period, must be less than 1.1 Most Probable Number per 100 milliliters (MPN/100 mL).
 2. Chemical Constituents – Groundwaters designated as MUN must not contain concentrations of chemical constituents in excess of the Primary or Secondary MCL based upon drinking water standards specified in the following provisions of CCR, title 22: Table 64431-A of section 64431 (Inorganic Chemicals), Table 64444-A of section 64444 (Organic Chemicals), Table 64449-A of section 64449 (Secondary MCLs – Consumer Acceptance Contaminant Levels), and Table 64449-B of section 64449 (Secondary MCLs – Consumer Acceptance Contaminant Level Ranges). This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect. Groundwaters must not contain concentrations of chemical constituents that adversely affect the water for beneficial uses.
 3. Radioactivity – Radionuclides must not be present in concentrations that are deleterious to human, plant, animal, or aquatic life, or that result in the accumulation of radionuclides in the food chain to an extent that it presents a hazard to human, plant, animal, or aquatic life. Groundwater designated MUN must not contain concentrations of radionuclides in excess of limits specified in CCR, title 22, section 64442, Table 64442, and section 64443, Table 64443, including future changes as the changes take effect.
 4. Taste and Odors – Groundwaters must not contain taste or odor-producing substances in concentrations that cause a nuisance or that adversely affect beneficial uses. For groundwaters designated as MUN, at a minimum, concentrations must not exceed adopted Secondary MCLs as specified in CCR, title 22, section 64449, Table 64449-A (Secondary MCLs – Consumer Acceptance Contaminant Level) and Table 64449-B (Secondary MCLs – Consumer Acceptance Contaminant Levels Ranges) including future changes as the changes take effect.

B. Under no circumstances shall the Discharger cause the presence of the following substances or conditions in surface waters of the Chafee and Gloster Hydrologic Areas.

1. Ammonia – The neutral, un-ionized ammonia species (NH_3) is highly toxic to freshwater fish. The fraction of toxic NH_3 to total ammonia species ($\text{NH}_4^+ + \text{NH}_3$) is a function of temperature and pH. Tables 3-1 to 3-4 from the Basin Plan were derived from USEPA ammonia criteria for freshwater. Ammonia concentrations must not exceed the values listed for the corresponding conditions in these tables. For temperature and pH values not explicitly in these tables, the most conservative value neighboring the actual value may be used or criteria can be calculated from numerical formulas available on page 3-4 of the Basin Plan.
2. Bacteria – Waters must not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes. The fecal coliform concentration during any 30-day period must not exceed a log mean of 20/100 milliliters (mL), nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 mL. The USEPA recommends that the log mean should ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 mL for any 30-day period indicates violation of this objective even if fewer than five samples were collected.
3. Biostimulatory Substances – Waters must not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.
4. Chemical Constituents – Waters designated as MUN must not contain concentrations of chemical constituents in excess of the Primary or Secondary MCL based upon drinking water standards specified in CCR, title 22, chapter 15, article 1, section 64400 et. seq. Waters designated as AGR must not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes). Waters must not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.
5. Chlorine, Total Residual – For the protection of aquatic life, total chlorine residual must not exceed either a median value of 0.002 mg/L or a maximum value of 0.003 mg/L. Median values must be based on daily measurements taken within any six month period.

6. Color – Waters must be free of coloration that causes nuisance or adversely affects the water for beneficial uses.
7. Dissolved Oxygen – The dissolved oxygen concentration, as percent saturation, must not be depressed by more than 10 percent, nor shall the minimum dissolved oxygen concentration be less than 80 percent of saturation. The minimum dissolved oxygen concentration must not be less than 4.0 mg/L as a daily minimum, 5.0 mg/L as a 7-day mean, and 6.5 mg/L as a 30-day mean.
8. Floating Materials – Waters must not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses. For natural high quality waters, the concentrations of floating material must not be altered to the extent that such alterations are discernible at the 10 percent significance level.
9. Oil and Grease – Waters must not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses. For natural high quality waters, the concentration of oils, greases, or other film or coat generating substances must not be altered.
10. Nondegradation of Aquatic Communities and Populations – All waters must be free from substances attributable to wastewater or other discharges that produce adverse physiological responses in humans, animals, or plants; or which lead to the presence of undesirable or nuisance aquatic life. All waters must be free from activities that would substantially impair the biological community as it naturally occurs due to physical, chemical and hydrologic processes.
11. pH – Changes in normal ambient pH levels must not exceed 0.5 pH units. The pH must not be depressed below 6.5 nor raised above 8.5. Compliance with the pH objective for these waters will be determined on a case-by-case basis.
12. Radioactivity – Radionuclides must not be present in concentrations which are deleterious to human, plant, animal, or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life. Waters designated as MUN must not contain

concentrations of radionuclides in excess of the limits specified in CCR, title 22.

13. Sediment – The suspended sediment load and suspended sediment discharge rate of surface waters must not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.
14. Settleable Materials – Waters must not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. For natural high quality waters, the concentration of settleable materials must not be raised by more than 0.1 milliliter per liter.
15. Suspended Materials – Waters must not contain suspended materials in concentrations that cause nuisance or that adversely affect the water for beneficial uses. For natural high quality waters, the concentration of total suspended materials must not be altered to the extent that such alterations are discernible at the 10 percent significance level.
16. Taste and Odor – Waters must not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. For naturally high quality waters, the taste and odor must not be altered.
17. Temperature – The natural receiving water temperature of all waters must not be altered unless it can be demonstrated to the satisfaction of the Water Board that such an alteration in temperature does not adversely affect the water for beneficial uses. For waters designated WARM, water temperature must not be altered by more than five degrees Fahrenheit (5°F) above or below the natural temperature. For waters designated COLD, the temperature must not be altered.
18. Toxicity – All waters must be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration and/or other appropriate methods as specified by the Water Board (or the Executive Officer or his/her designee). The survival of aquatic life in surface waters subjected to a waste discharge, or

other controllable water quality factors, must not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary, for other control water that is consistent with the requirements for “experimental water” as defined in Standard Methods for the Examination of Water and Wastewater (American Public Health Association, et al. 1998).

19. Turbidity – Waters must be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

II. REQUIREMENTS AND PROHIBITIONS

A. General

1. The discharge must not cause or threaten to cause a condition of pollution or nuisance as defined in CWC, section 13050.
2. The discharge of waste, as defined in CWC, section 13050, subdivision (d), must not cause an exceedance of any narrative or numeric WQO contained in the Basin Plan.
3. There must be no discharge, bypass, or diversion of designated wastes from the collection, conveyance, or WMUs to adjacent land areas or surface waters.
4. Where any numeric or narrative WQO contained in the Basin Plan is already being exceeded, any discharge which causes further degradation or pollution is prohibited.
5. Surface drainage within the heap leach pad, the solution conveyance channel, and surface impoundments WMUs must be contained within those WMUs. No wastewater contained within the heap leach pad, solution conveyance channel, or surface impoundments WMUs is to be discharged outside those WMUs.
6. All facilities used for the collection, conveyance, or disposal of waste must be adequately protected against overflow, washout, inundation, structural damage, or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.
7. The discharge of hazardous waste to the surface impoundments or generation of hazardous waste due to evaporation in the surface impoundments is prohibited.

8. The discharge of solid wastes, leachate, wastewater, or any other deleterious materials to groundwater is prohibited.
9. The discharge of designated waste, process solution, or any material containing cyanide except to the authorized WMUs, is prohibited.
10. The discharge must not cause any increases in the concentration of waste constituents in soil-pore liquid, soil, or other geologic materials outside of the surface impoundments if such waste constituents could migrate to waters of the State – in either liquid or gaseous phase – or cause a condition of nuisance, degradation, contamination, or pollution.
11. The discharge of waste in a manner that does not maintain a five-foot separation between the waste and the seasonal high groundwater table is prohibited as specified in CCR, title 27, section 20240, subdivision (c).
12. The integrity of the heap leach pad, solution conveyance channel, and the surface impoundments must be maintained throughout the life of the Facility and must not be diminished as a result of maintenance operation or lack thereof.
13. The discharge of pesticides to surface waters or groundwater is prohibited.
14. Water used for dust control must be limited to a minimal amount. A "minimal amount" is defined as that amount which will not result in run-off.
15. The Discharger must maintain in good working order any control system or monitoring device installed to achieve compliance with this Order.
16. The Discharger must at all times maintain adequate and viable financial assurances acceptable to the Water Board Executive Officer for costs associated with closure, post-closure maintenance and monitoring, and for corrective action for all known or reasonably foreseeable releases.

B. Waste Management Units

1. The WMU liner systems must be constructed and maintained as described in Finding No. 16.

2. The surface impoundment freeboard, the vertical distance between the liquid surface elevation and the lowest part of the pond dike or the invert of an overflow structure, must be a minimum of two feet at all times, as specified in CCR, title 27, section 20375.
3. All lined WMUs must be effectively sealed to prevent the exfiltration of liquids. For this Facility, "effectively sealed" facilities are WMUs that are designed and constructed to meet the requirements of CCR, title 27, sections 20310, 20320, and 20330.
4. Within 90 days following maintenance or reconstruction of an engineered alternative liner system, a technical report must be submitted containing at least a construction quality assurance/quality control report; if liner construction occurs, the technical report must also include as-built drawings. The report must contain all field and laboratory data generated during the maintenance and construction activities. The report must also contain certification, signed by a California professional civil engineer, that the lined WMU was constructed and suitable for operation in accordance with CCR, title 27 requirements.

C. Leachate Collection and Recovery Systems

1. If a quantity of leachate is detected in a LCRS above the ALR, as specified in MRP No. R6V-2021-TENTATIVE, the Discharger must immediately take steps to locate and repair leak(s) in the liner system and comply with the Exceeding the Leakage Rates requirements presented in MRP No. R6V-2021-TENTATIVE, Section IV.B.2, "Unscheduled Reports to be Filed With the Water Board." If subsequent repairs do not result in a reduction in the leakage rate to less than the ALR for any given surface impoundment, the Discharger must immediately cease the discharge of waste to that surface impoundment, including leachate, and notify the Water Board. The notification must include a timetable for remedial action to repair the liner of the surface impoundment(s).
2. The LCRS must be operated to function without clogging through the scheduled closure of the Unit and during the post-closure maintenance period.
3. Any leachate collected in the LCRS must either be returned to one of the WMUs or disposed at a Class II WMU.

D. Precipitation and Drainage Controls

All diversion and drainage facilities shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff as specified in CCR, title 27, section 22490, subsection (h).

E. Electronic Submittal of Information

Pursuant to CCR, title 23, section 3890, the Discharger must submit all reports, including soil and water data, prepared for the purpose of subsurface investigation or remediation of a discharge of waste to land subject to Division 2 of title 27, CCR, electronically over the internet to the State Water Board's GeoTracker system. This requirement is in addition to, and not superseded by, any other applicable reporting requirement.

III. WATER QUALITY MONITORING AND RESPONSE PROGRAMS

A. Water Quality Protection Standard

1. The WQPS consists of COCs, concentration limits, monitoring points, and the point of compliance. The COCs, concentration limits, monitoring points, and point of compliance for groundwater and unsaturated zone monitoring are described in MRP No. R6V-2021-TENTATIVE.
2. The Discharger must submit a revised ROWD to the Water Board at least 120 days before initiating discharge of any new COCs to the WMUs. Before a new discharge commences, the Discharger must estimate the concentration for such constituents within the wastewater stream and submit written statistical method(s) in order to detect a release of such constituents.
3. At any given time, the concentration limit for each monitoring parameter and COC must be equal to the background data set of that constituent unless a concentration limit greater than background has been established. The background data set for each monitoring point/constituent pair should be comprised of at least eight data points, collected quarterly.
4. If the Discharger or Water Board Executive Officer determines that concentration limits were or are exceeded, the Discharger may immediately institute verification procedures upon such determination as specified in Section III.F of this Order or, within 90 days of such determination, submit a technical report pursuant CWC, section 13267, subdivision (b), proposing an EMP meeting the provisions of CCR, title 27. In the event of a release, the

Discharger will have 90 days once the Water Board authorizes the establishment of the EMP to complete the delineation, develop a suite of proposed corrective action measures, and submit a revised ROWD with a proposed CAP for adoption by the Water Board.

5. Monitoring of the groundwater and the unsaturated zone must be conducted to obtain background data and to provide the best assurance of the early detection of any releases from the Facility.

B. Detection Monitoring Program

The Discharger must maintain a DMP as specified in CCR, title 27, section 20420.

C. Evaluation Monitoring Program

The Discharger must perform an EMP whenever there is measurably significant evidence and/or significant physical evidence of release as specified in CCR, title 27, section 20385, subdivision (a)(2) or (3). Within 90 days of initiating the EMP, the Discharger must delineate the nature and extent of the release, as well as develop, propose, and support corrective action measures to be implemented in a CAP.

D. Corrective Action Program

The Discharger must implement a corrective action program as specified in CCR, title 27, section 20385 and 20430(c), following completion of an EMP.

E. Data Analysis

Within 45 days after completion of sampling, the Discharger must determine at each monitoring point whether there is measurably significant evidence and/or significant physical evidence of a new release from the Facility. The analysis must consider all monitoring parameters and COCs. The Executive Officer may also make an independent finding that there is measurably significant evidence and/or significant physical evidence of a new release.

1. To determine whether there is "measurably significant" (as defined in CCR, title 27, section 20164) evidence of a new release from the Facility, the Discharger must use approved statistical data analysis methods to evaluate point of compliance groundwater data, as specified in CCR, title 27, section 20415, subdivision (e)(7).
2. To determine whether there is significant physical evidence of a new release from the Facility, the Discharger must also use non-

statistical methods. Significant physical evidence may include, but is not limited to, unexplained volumetric changes in the surface impoundments, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of spill/release, unexplained water table mounding beneath or adjacent to the surface impoundments, and/or any other change in the environment that could be reasonably be expected to be the result of a new release from the surface impoundments. Other non-statistical evidence of a release may include trends of increasing concentrations of one or more constituents over time.

3. If there is measurably significant evidence and/or significant physical evidence of a new release, the Discharger must immediately notify the Water Board by telephone as to the monitoring points and constituent(s) or parameters involved followed by written notification sent certified mail within seven days (see "Unscheduled Reports to be Filed With the Water Board," MRP No. R6V-2021-TENTATIVE). The Discharger must initiate the verification procedures, as specified in this Order, Section III.F.

F. Verification Procedures

Whenever there is a determination by the Discharger or Executive Officer that there is measurably significant evidence or significant physical evidence of a new release, the Discharger must initiate verification procedures as specified below.

1. The Discharger must either conduct a composite retest using data from the initial sampling event with all data obtained from the resampling event or must conduct a discrete retest in which only data obtained from the resampling event must be analyzed to verify evidence of a release. Alternatively, the Discharger may perform a pass 1-of-3 retesting approach using quarterly samples, as an engineered alternative.
2. The verification procedure need only be performed for the constituent(s) that has shown a measurably significant evidence of a release and must be performed for those monitoring points at which a release is indicated.
3. Within seven days of receiving the results of the last laboratory analyses for the retest, the Discharger must report to the Water Board, by certified mail, the results of the verification procedure, as well as all data collected for use in the retest.

4. If the Discharger or Executive Officer verifies that there is or was evidence of a release, the Discharger is required to submit a technical report to the Water Board within 90 days of such a determination, pursuant to CWC, section 13267, subdivision (b). The report must propose an EMP (see Section III.C above) or make a demonstration to the Water Board that there is a source other than the WMU that caused evidence of a release (see "Unscheduled Reports to be Filed With the Water Board," MRP No. R6V-2021-TENTATIVE).
5. If the Discharger declines to conduct verification procedures, the Discharger must submit a technical report, as specified in this Order, Section III.G.

G. Technical Report Without Verification Procedures

If the Discharger chooses not to initiate verification procedures after there has been a determination made for evidence of a release, a technical report must be submitted pursuant to CWC, section 13267(b). The report must propose an EMP or attempt to demonstrate that the release did not originate from the surface impoundments.

H. Monitoring and Reporting

1. Pursuant to CWC, section 13267, subdivision (b), the Discharger must comply with the monitoring and reporting requirements as established in the attached MRP No. R6V-2021-TENTATIVE and as specified by the Executive Officer. The MRP may be modified by the Water Board Executive Officer.
2. The Discharger must comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made part of MRP No. R6V-2021-TENTATIVE.

IV. PROVISIONS

A. Rescission of Waste Discharge Requirements

Board Order No. R6V-2010-0031 and MRP No. R6V-2010-0031 are hereby rescinded.

B. Standard Provisions

The Discharger must comply with the "Standard Provisions for Waste Discharge Requirements," dated September 1, 1994, in Attachment D, which is attached to and made part of this Order.

C. Closure Plan

The preliminary closure and post-closure maintenance plan must be updated if there is a substantial change in operations or costs for closure. The Discharger must submit a report to the Water Board on or before **January 30, 2022**, and by **January 30** every year thereafter, indicating that the preliminary closure and post-closure maintenance plan is in conformance with existing Facility operations. This report may be included in the annual monitoring report as required in MRP No. R6V-2021-TENTATIVE.

A final closure plan must be submitted to the Water Board for review and approval **at least 180 days prior** to beginning any partial or final closure activities, or prior to discontinuing the use of the Facility for waste treatment, storage, or disposal pursuant to CCR, title 27, section 21710(c)(5)(B). The final closure plan must be prepared by or under the supervision of either a California professional civil engineer or a California professional engineering geologist and be in compliance with CCR, title 27, section 21400.

D. Known or Reasonably Foreseeable Release Plan

The known or reasonably foreseeable release plan must be updated if there is a substantial change in operations or in site conditions. The Discharger must submit a report to the Water Board on or before **January 30, 2022**, and by **January 30** every year thereafter, indicating that the known or reasonably foreseeable release plan is in conformance with existing Facility conditions. This report may be included in the annual monitoring report as required in MRP No. R6V-2021-TENTATIVE.

E. Financial Assurance

The Discharger must submit to the Water Board a financial assurance report on or before **July 30, 2022**, and by **July 30** every year thereafter, providing evidence that adequate financial assurances have been provided for closure, post-closure maintenance, and for corrective action of all known or reasonably foreseeable releases. Evidence must include the total amount of money available in the fund developed by the Discharger. In addition, the Discharger must either provide evidence that the amount of financial assurance is still adequate or increase the amount of financial assurance by an appropriate amount. An increase may be necessary due to inflation, change(s) in regulatory requirements, change(s) in the accepted preliminary closure and post-closure maintenance plan, or other unforeseen events.

F. Modifications to the Facility

If the Discharger intends to expand the Facility or the capacity of the surface impoundments or heap leach pad, a report must be filed with the Water Board **no later than 120 days prior** to the anticipated change, containing a detailed plan for Facility expansion. This plan must include but is not limited to, a time schedule for studies, design, and other information needed to document the proposed expansion of the Facility. Pursuant to CWC, section 13260(k), a report is required on the physical and chemical characteristics of the waste that could affect its potential to cause pollution or contamination, and a report is required to evaluate the potential of the discharge of the mining waste to produce, over the long term, acid mine drainage, the discharge or leaching of heavy metals, or the release of hazardous substances.

V. TIME SCHEDULE

A. Final Design Plan

At least 90 days prior to construction of any new or expanded WMU, the Discharger must submit design plans for the WMU in accordance with the requirements of CCR, title 27, section 22490, including accepted engineered alternatives with, but not limited to, design capacity, details of the LCRS, the unsaturated zone monitoring system, and the groundwater monitoring well locations. The Final Design Plan is to be accepted by the Water Board's Executive Officer.

B. Final Construction Quality Assurance Report

No later than 180 days following the construction completion of a WMU, and **at least 60 days** prior to discharge onto the WMU, a Final Construction Quality Assurance Report, required in CCR, title 27, section 20324, subdivision (d)(1)(C), must be submitted to the Water Board for review and acceptance. The report must be certified by a California professional civil engineer or a California professional engineering geologist. It must contain sufficient information and test results to verify that construction was in accordance with the submitted design plans and specifications and with the accepted engineered alternative to the prescriptive standards and performance goals of CCR, title 27.

C. Monitoring Systems Installations Report

No later than 90 days following the construction completion of a monitoring system or monitoring system component, and **at least 60 days** prior to discharging to a new WMU, the Discharger must submit a technical report discussing the installation of the monitoring systems or

monitoring system component for the WMU. The report must summarize all work activities associated with the installation of the groundwater and vadose zone monitoring systems. The report must be certified by a California professional civil engineer or a California professional geologist. It must contain sufficient information to verify that the construction was in accordance with State and/or County standards.

D. Sampling and Analysis Plan

At least 60 days prior to operation of a new WMU, the Discharger must submit a revised Sampling and Analysis Plan to be accepted by the Water Board's Executive Officer, including procedures for sampling and analysis for the surface impoundments, the heap leach pads, the solution conveyance channel, the LCRSs, unsaturated zone monitoring, and groundwater monitoring wells.

E. Water Quality Protection Standard

No later than 760 days following construction (8 quarters of monitoring, plus 30 days to generate the Water Quality Protection Standard), the Discharger must propose for acceptance by the Water Board a list of monitoring parameters and constituents of concern for each new monitoring point for which a WQPS has not been established, including a data analysis method, a revised WQPS, which includes concentration limits that define background water quality for all COCs and for each Point of Compliance. The report must be certified by a California professional civil engineer or a California professional geologist.

F. Financial Assurances

At least 60 days prior to discharge to a new WMU, and yearly thereafter, the Discharger must submit Instruments of Financial Assurance acceptable to the Water Board.

1. A Financial Assurance Instrument providing adequate funding for the closure activities, as described in the accepted preliminary closure and post-closure maintenance plan, must be submitted to the Water Board, pursuant to CCR, title 27, section 22207.
2. A Financial Assurance Instrument providing adequate funding for the post-closure monitoring and maintenance activities, as described in the accepted preliminary closure and post-closure maintenance plan, must be submitted to the Water Board, pursuant to CCR, title 27, section 22212.

3. A Financial Assurance Instrument providing adequate funding for corrective action of a known and reasonably foreseeable release must be submitted to the Water Board, pursuant to CCR, title 27, section 20080, subdivision (a)(1).

G. Monitoring Well Installation Work Plan

No later than 60 days following the adoption of this Order, the Discharger must submit for Water Board review and acceptance a work plan for the installation of additional monitoring wells, establishing a groundwater monitoring network to adequately monitor the point of compliance downgradient of the WMUs. The work plan must propose the installation of an adequate number of monitoring wells to monitor groundwater downgradient of the heap leach pad (Phase 1, Stages 1 through 3), solution conveyance channel, pump box, and surface impoundments. The locations of the monitoring wells should consider the localized groundwater flow direction, as a result of supply well pumping. The work plan must be certified by a California professional civil engineer or a California professional geologist.

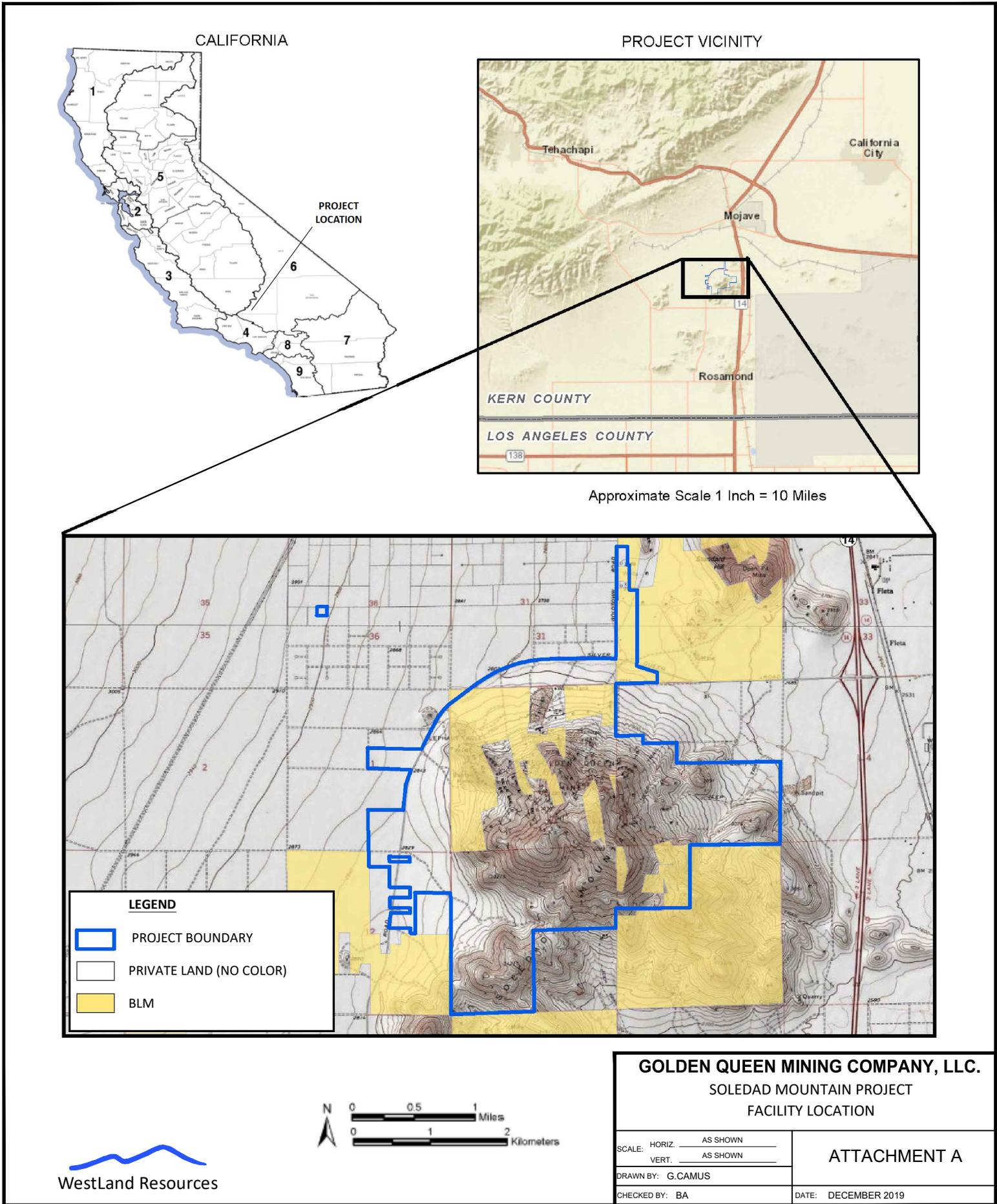
I, Michael R. Plaziak, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Lahontan Region, on May 12, 2021.

MICHAEL R. PLAZIAK
EXECUTIVE OFFICER

Attachments:

- A. Facility Location, Golden Queen Mining Co., LLC
- B. Aerial View of Facility, Golden Queen Mining Co., LLC
- C. Waste Characterization Sample Results
- D. Standard Provisions for Waste Discharge Requirements

Golden Queen Mining Co., Soledad Mountain Project – Attachment A



Approximate Scale 1 Inch = 10 Miles

LEGEND

- PROJECT BOUNDARY
- PRIVATE LAND (NO COLOR)
- BLM



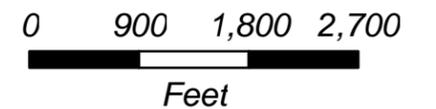
GOLDEN QUEEN MINING COMPANY, LLC.	
SOLEDAD MOUNTAIN PROJECT FACILITY LOCATION	
SCALE: HORIZ. AS SHOWN	ATTACHMENT A
VERT. AS SHOWN	
DRAWN BY: G.CAMUS	
CHECKED BY: BA	DATE: DECEMBER 2019

Golden Queen Mining Co., Soledad Mountain Project – Attachment B

WASTE DISCHARGE REQUIREMENTS
 BOARD ORDER NO. R6V-2021-TENTATIVE
 WDID NO. 6B159708001

Legend

- ✕ Destroyed
- Vadoso Zone Monitoring Lysimeter
- Monitoring Well
- Private Well
- Production Well
- Leachate Collection Recovery System
- Phase 1 Heap Leach Pad
- Phase 2 Heap Leach Pad
- Approved Project Boundary
- Pit Boundary

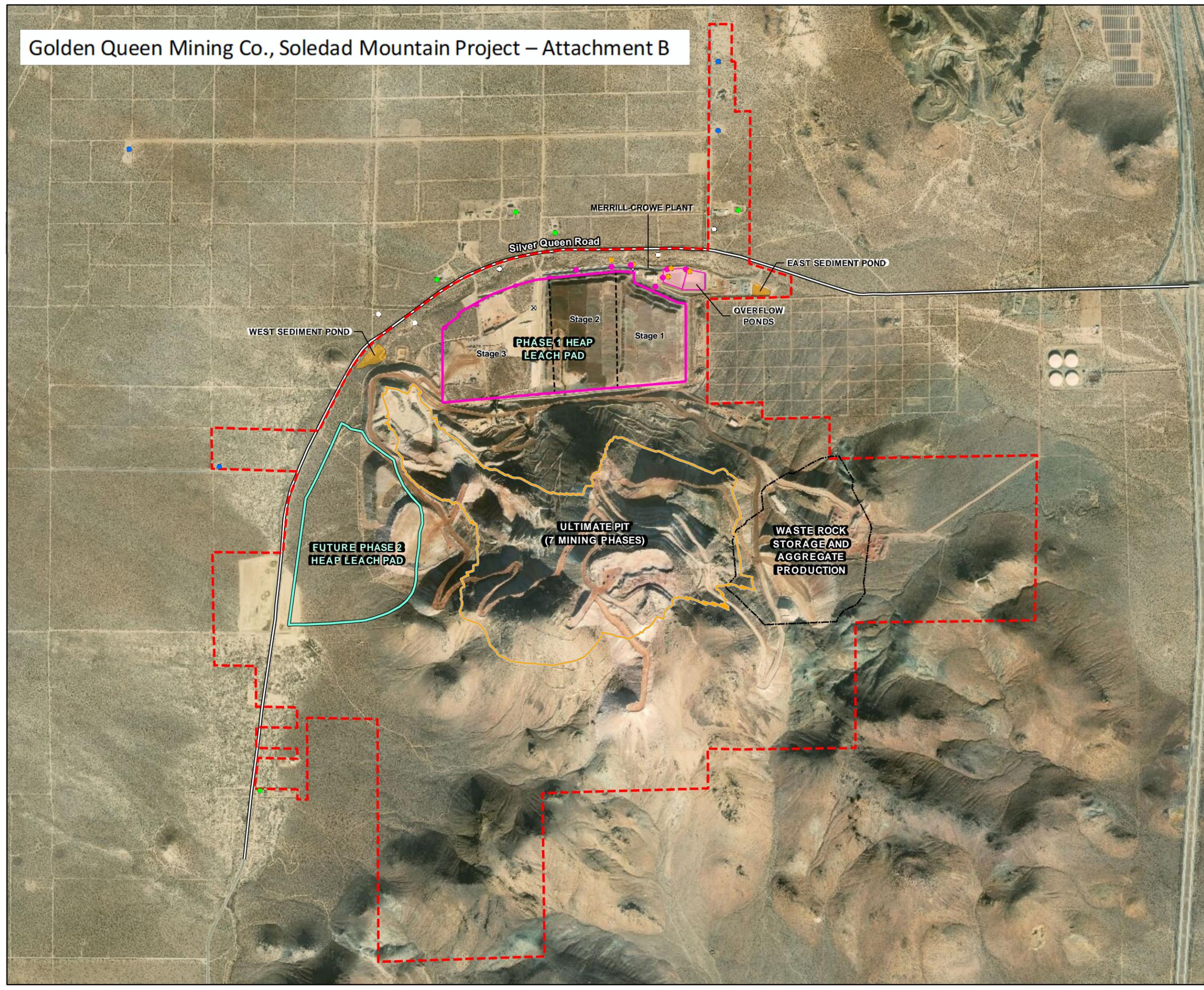


Aerial Source: Google Earth Imagery, dated in 04/2015.
 Projection: NAD1983, StatePlane California V,
 FIPS 0405, Feet

GOLDEN QUEEN MINING CO., LLC
 SOLEDAD MOUNTAIN MINE
 KERN COUNTY, CALIFORNIA

Aerial View of
 Facility

CITY: Boulder, CO DIV/GROUP: AIT PM: T. COX TM: TR: J.CHEN
 Project (Project #): A0000100.0012 Path: K:\A0000100_Soledad\GIS\ArcMap_MXD\QuarterlyMonitoringReport\Fig_1_Monitoring_Well_Locs.mxd Last Saved: 10/9/2019 Saved By: akens



ATTACHMENT C - WASTE CHARACTERIZATION SAMPLE RESULTS

Constituent	Units	Discharge Concentrations	Date of Sampling
Pregnant Solution			
Antimony	mg/L	<0.2	09/17/2020
Arsenic	mg/L	0.36	09/17/2020
Barium	mg/L	<0.050	09/17/2020
Beryllium	mg/L	<0.050	09/17/2020
Boron	mg/L	<0.20	09/17/2020
Cadmium	mg/L	<0.050	09/17/2020
Calcium	mg/L	231	09/17/2020
Chloride	mg/L	291	09/17/2020
Cobalt	mg/L	0.28	09/17/2020
Copper	mg/L	7.40	09/17/2020
Cyanide	mg/L	210	01/28/2021
Fluoride	mg/L	<1.0	09/17/2020
Iron	mg/L	<0.10	09/17/2020
Lead	mg/L	<0.10	09/17/2020
Magnesium	mg/L	<0.50	09/17/2020
Manganese	mg/L	<0.050	09/17/2020
Mercury	mg/L	N/A	09/17/2020
Molybdenum	mg/L	0.25	09/17/2020
Nickel	mg/L	0.450	09/17/2020
Nitrate – as Nitrogen	mg/L	N/A	09/17/2020
Nitrite – as Nitrogen	mg/L	N/A	09/17/2020
pH	pH Units	9.7	09/17/2020
Phosphorus	mg/L	<0.50	09/17/2020
Potassium	mg/L	40	09/17/2020
SC	µmhos/cm	1860	09/17/2020
Selenium	mg/L	<0.20	09/17/2020
Silver	mg/L	3.40	09/17/2020
Sodium	mg/L	136	09/17/2020
Sulfate	mg/L	393	09/17/2020
TDS	mg/L	<10.0	09/17/2020
Thallium	mg/L	<10	09/17/2020
Total Alkalinity	mg/L	N/A	09/17/2020
Total Chromium	mg/L	<0.10	09/17/2020
Vanadium	mg/L	0.101	09/17/2020
Zinc	mg/L	23.5	09/17/2020

Constituent	Units	Discharge Concentrations	Date of Sampling
Barren Solution			
Antimony	mg/L	<0.2	09/17/2020
Arsenic	mg/L	0.31	09/17/2020
Barium	mg/L	<0.050	09/17/2020
Beryllium	mg/L	<0.050	09/17/2020
Boron	mg/L	<0.20	09/17/2020
Cadmium	mg/L	<0.050	09/17/2020
Calcium	mg/L	232	09/17/2020
Chloride	mg/L	289	09/17/2020
Cobalt	mg/L	0.28	09/17/2020
Copper	mg/L	7.40	09/17/2020
Cyanide	mg/L	236	01/28/2021
Fluoride	mg/L	<1.0	09/17/2020
Iron	mg/L	0.13	09/17/2020
Lead	mg/L	<0.10	09/17/2020
Magnesium	mg/L	<0.50	09/17/2020
Manganese	mg/L	<0.050	09/17/2020
Mercury	mg/L	N/A	09/17/2020
Molybdenum	mg/L	0.46	09/17/2020
Nickel	mg/L	0.455	09/17/2020
Nitrate – as Nitrogen	mg/L	N/A	09/17/2020
Nitrite – as Nitrogen	mg/L	N/A	09/17/2020
pH	pH Units	9.9	09/17/2020
Phosphorus	mg/L	<0.50	09/17/2020
Potassium	mg/L	39.8	09/17/2020
SC	µmhos/cm	1870	09/17/2020
Selenium	mg/L	<0.20	09/17/2020
Silver	mg/L	0.336	09/17/2020
Sodium	mg/L	136	09/17/2020
Sulfate	mg/L	396	09/17/2020
TDS	mg/L	<10.0	09/17/2020
Thallium	mg/L	<0.10	09/17/2020
Total Alkalinity	mg/L	N/A	09/17/2020
Total Chromium	mg/L	<0.20	09/17/2020
Vanadium	mg/L	0.052	09/17/2020
Zinc	mg/L	31.1	09/17/2020

J = estimated concentration
 mg/L = milligrams per liter
 N = nitrogen
 P = phosphorus

SC = specific conductance
 TDS = total dissolved solids
 mhos/cm = micromhos per centimeter
 N/A = not applicable

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

STANDARD PROVISIONS
FOR WASTE DISCHARGE REQUIREMENTS

1. Inspection and Entry

The Discharger shall permit Regional Board staff:

- a. to enter upon premises in which an effluent source is located or in which any required records are kept;
- b. to copy any records relating to the discharge or relating to compliance with the Waste Discharge Requirements (WDRs);
- c. to inspect monitoring equipment or records; and
- d. to sample any discharge.

2. Reporting Requirements

- a. Pursuant to California Water Code 13267(b), the Discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurred as a result of this discharge; written confirmation shall follow within two weeks. An adverse condition includes, but is not limited to, spills of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance.
- b. Pursuant to California Water Code Section 13260 (c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Regional Board at least 120 days in advance of implementation of any such proposal. This shall include, but not be limited to, all significant soil disturbances.
- c. The Owners/Discharger of property subject to WDRs shall be considered to have a continuing responsibility for ensuring compliance with applicable WDRs in the operations or use of the owned property. Pursuant to California Water Code Section 13260(c), any change in the ownership and/or operation of property subject to the WDRs shall be reported to the Regional Board. Notification of applicable WDRs shall be furnished in writing to the new owners and/or operators and a copy of such notification shall be sent to the Regional Board.
- d. If a Discharger becomes aware that any information submitted to the Regional Board is incorrect, the Discharger shall immediately notify the Regional Board, in writing, and correct that information.

- e. Reports required by the WDRs, and other information requested by the Regional Board, must be signed by a duly authorized representative of the Discharger. Under Section 13268 of the California Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation.
- f. If the Discharger becomes aware that their WDRs (or permit) are no longer needed (because the project will not be built or the discharge will cease) the Discharger shall notify the Regional Board in writing and request that their WDRs (or permit) be rescinded.

3. Right to Revise WDRs

The Regional Board reserves the privilege of changing all or any portion of the WDRs upon legal notice to and after opportunity to be heard is given to all concerned parties.

4. Duty to Comply

Failure to comply with the WDRs may constitute a violation of the California Water Code and is grounds for enforcement action or for permit termination, revocation and re-issuance, or modification.

5. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of the WDRs which has a reasonable likelihood of adversely affecting human health or the environment.

6. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the WDRs. Proper operation and maintenance includes adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the WDRs.

7. Waste Discharge Requirement Actions

The WDRs may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for waste discharge requirement modification, revocation and re-issuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any of the WDRs conditions.

8. Property Rights

The WDRs do not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

9. Enforcement

The California Water Code provides for civil liability and criminal penalties for violations or threatened violations of the WDRs including imposition of civil liability or referral to the Attorney General.

10. Availability

A copy of the WDRs shall be kept and maintained by the Discharger and be available at all times to operating personnel.

11. Severability

Provisions of the WDRs are severable. If any provision of the requirements is found invalid, the remainder of the requirements shall not be affected.

12. Public Access

General public access shall be effectively excluded from treatment and disposal facilities.

13. Transfers

Providing there is no material change in the operation of the facility, this Order may be transferred to a new owner or operation. The owner/operator must request the transfer in writing and receive written approval from the Regional Board's Executive Officer.

14. Definitions

- a. "Surface waters" as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses and natural lakes and artificial impoundments of waters. "Surface waters" does not include artificial water courses or impoundments used exclusively for wastewater disposal.
- b. "Ground waters" as used in this Order, include, but are not limited to, all subsurface waters being above atmospheric pressure and the capillary fringe of these waters.

15. Storm Protection

All facilities used for collection, transport, treatment, storage, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION**

**MONITORING AND REPORTING PROGRAM
NO. R6V-2021-TENTATIVE
WDID NO. 6B159708001**

FOR

**GOLDEN QUEEN MINING COMPANY, LLC., AND
THE U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT
SOLEDAD MOUNTAIN PROJECT**

Kern County

This Monitoring and Reporting Program (MRP) No. R6V-2021-TENTATIVE is issued to Golden Queen Mining Co., LLC., and the U.S. Department of the Interior, Bureau of Land Management (the Dischargers) for the Soledad Mountain Project (Facility) pursuant to California Water Code (CWC), section 13267 and incorporates requirements for groundwater and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations (CCR), title 27, section 20005, et seq. The technical reports required by Order No. R6V-2021-TENTATIVE and MRP No. R6V-2021-TENTATIVE are necessary to ensure compliance with the Waste Discharge Requirements (WDRs). Therefore, the burden, including costs, of these reports bears a reasonable relationship to the need for the report and the benefits to be obtained from the reports.

I. WATER QUALITY PROTECTION STANDARD

A Water Quality Protection Standard (WQPS), as specified in CCR, title 27, sections 20390 through 20415, is required to assure the earliest possible detection of a release from a waste management unit (WMU) to the underlying soil and/or groundwater. The WQPS consists of all constituents of concern (COCs), the concentration limits for each COC, the point of compliance, and all water quality monitoring points. The Executive Officer shall review and approve the WQPS, or any modification thereto, for each monitored medium.

The Discharger is currently implementing a detection monitoring program (DMP) to monitor groundwater and the unsaturated zone for the Facility. A WQPS is necessary to provide the best assurance of the earliest detection of any releases from the Facility.

A. Constituents of Concern

The COCs include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the WMUs (surface impoundments, heap leach pad, and solution conveyance channel). The COCs for each monitored medium are listed in Attachment A, which is made part of this MRP. The

Discharger must monitor all COCs at the sampling frequency and reporting frequency listed in Attachment A.

B. Monitoring Parameters

Monitoring parameters are those COCs that provide a reliable indication of a release from the WMUs. The monitoring parameters for each monitored medium are listed in this MRP, Attachment A. The Discharger must monitor all monitoring parameters at the sampling frequency and reporting frequency listed in Attachment A.

C. Concentration Limits

Concentration limits are established for each COC and are intended to reflect background ambient conditions of surface and subsurface media that are unaffected by a release from the existing WMUs. At any given time, the concentration limit for each COC must be equal to the background data set of that constituent unless a concentration limit greater than background (CLGB) has been established. CCR, title 27, section 20400 allows for various options to determine concentration limits.

1. The Discharger is using the following methodologies to determine concentration limits for the groundwater monitoring program.
 - a. Intrawell Comparisons – The Discharger is using historical water quality data from individual groundwater monitoring wells to develop well-specific concentration limits for inorganic constituents. Intrawell comparisons for these COCs are appropriate because these COCs show spatial variation in water quality across the site.
 - b. Non-Statistical Comparisons – For inorganic COCs either not detected in the background well or only detected at trace concentrations and for man-made organic COCs, the concentration limit is set at the respective practical quantitation limit (PQL) for the analytical method used.

If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the Facility, the Discharger may request modification of the WQPS concentration limits to provide seasonal or reason-specific concentration limits (background data sets) for each COC at each monitoring point.

CLGBs for corrective action may be proposed by the Discharger in accordance with CCR, title 27, section 20430, after proposed corrective action measures reveal that it is technically and economically infeasible to

achieve background water quality levels. The Discharger has not proposed CLGBs for this Facility.

D. Point of Compliance and Monitoring Points

The point of compliance and monitoring points for the groundwater and unsaturated zone systems are shown on Attachment B of this MRP. The Discharger may add monitoring points, as needed, to comply with the DMP, evaluation monitoring program (EMP), and corrective action program requirements contained in Order No. R6V-2021-TENTATIVE and this MRP, and as approved by the Water Board Executive Officer.

The point of compliance is a vertical surface located at the hydraulically downgradient limit of the surface impoundments and leach pad that extends through the uppermost aquifer underlying the Facility. Groundwater monitoring is occurring for the Facility; however, an adequate monitoring network that includes a sufficient number of monitoring points at appropriate locations has not been established to monitor the point of compliance downgradient of the WMUs. Order No. R6V-2021-TENTATIVE, Section V.G requires the Discharger to submit a work plan for the installation of additional groundwater monitoring wells to monitor the point of compliance. Monitoring well MW-6 is the background monitoring well. The unsaturated (vadose) zone monitoring is comprised of lysimeters for the heap leach pad, solution conveyance channel, and surface impoundments.

E. Compliance Period

The compliance period is the number of years equal to the active life of the WMUs plus any post-closure monitoring and maintenance period until the Water Board finds that the Facility no longer poses a threat to water quality. The compliance period is the minimum period during which the Discharger must conduct a water quality monitoring program subsequent to a release. The compliance period must begin anew each time the Discharger initiates an EMP. The compliance period may be extended if the Facility is not in compliance with its WQPS.

The Discharger plans to clean-close the surface impoundments as specified in CCR, title 27, section 21400, subdivision (b)(1). At closure, any residual water remaining in the ponds will be allowed to evaporate and all residual wastes, including liquids, sludges, precipitates, and settled solids will be completely removed, and disposed of based on their waste classification. The cleaned liner of the ponds will be folded onto themselves, punctured, and buried in place with clean soil. The perimeter berms will be regraded to match the surrounding grades. Transfer pipelines will be removed, salvaged, or disposed of offsite. The ore material on the heap leach pad will be rinsed and considered detoxified when total cyanide and WAD cyanide detected in the heap meet

regulatory limits. Detoxification limits will be established in a final closure plan and approved by the Water Board in Closure WDRs.

II. MONITORING

The Discharger must comply with the monitoring requirements outlined below. The Discharger must monitor the groundwater and the unsaturated zone beneath the WMUs, and monitor wastewater in the surface impoundments. All monitoring and inspection activities must be documented, and all sampling must be conducted in accordance with an approved Sampling and Analysis Plan (SAP) that includes quality assurance and quality control standards and procedures, as described in the General Provisions for Monitoring and Reporting (Attachment C of this MRP).

The Discharger must operate and maintain a detection monitoring system that complies with the DMP monitoring provisions contained in CCR, title 27, sections 20380 through 20420. Monitoring of the groundwater and unsaturated zone must be conducted to provide the best assurance of the early detection of a release from the Facility. Changes to the existing monitoring systems must be designed and certified by a California-licensed professional geologist or civil engineer as meeting the requirements of CCR, title 27, section 20415(e)(1). The Discharger must collect, preserve, and transport samples in accordance with the SAP.

All samples collected in accordance with this MRP, except for field parameters, are to be analyzed by a California state-certified laboratory using United States Environmental Protection Agency (USEPA) analytical methods or the most recently approved SW-846 USEPA method or other equivalent USEPA method. An alternate method may be used if acceptable to the Executive Officer.

A. Wastewater Effluent

The Discharger must monitor the composition of wastewater discharged to the surface impoundments through the collection of liquid samples for laboratory analysis. All observations and measurements must be recorded in a permanent logbook kept onsite.

1. Monitoring Points

A liquid grab sample will be collected from the wastewater conveyance system at a location upgradient from the point of discharge to a surface impoundment. The sample location must be documented for each sampling event.

2. Monitoring Parameters and Constituents of Concern

The Discharger must monitor wastewater liquid for all COCs and monitoring parameters in accordance with the frequencies listed in Attachment A.

3. Field Parameters

The Discharger must monitor wastewater liquid for all field parameters in accordance with the frequencies listed in Attachment A.

4. Flow Rate Characteristics

The Discharger must record the following flow rate characteristics of wastewater discharged to the surface impoundment: the volume of NaCN applied to the Facility; the maximum daily flow rate in gallons per day; the total volume of flow in gallons per day; and the cumulative total of wastewater discharged in gallons per month.

5. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of all field monitoring equipment.

B. Surface Impoundments/Overflow Ponds

The Discharger must monitor the composition of wastewater discharged to the surface impoundments through the collection of liquid and solid samples for laboratory analyses. All observations and measurements must be recorded in a permanent logbook kept onsite.

1. Monitoring Points

A liquid grab sample will be collected from each surface impoundment at a location, as specified herein: opposite the discharge inlet; at a depth of one foot below the water surface elevation; and in a quiescent area of the surface impoundment.

If a surface impoundment is dry at the time of monitoring, this information must be recorded and reported to the Water Board in accordance with the reporting requirements of MRP, Section IV.A.

2. Monitoring Parameters and Constituents of Concern

The Discharger must monitor surface impoundment liquids for all COCs and monitoring parameters in accordance with the frequencies listed in Attachment A.

3. Field Parameters

The Discharger must monitor surface impoundment liquids for all field parameters in accordance with the frequencies listed in Attachment A.

4. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of all field monitoring equipment.

5. Dikes and Liners

The Discharger must visually inspect each of the surface impoundment dikes and exposed liners at a regular frequency (such as daily) to determine if there are any indication of loss of integrity. Should the inspection indicate that any unauthorized discharge has occurred, or may occur, the Discharger must notify the Water Board within 24 hours of the inspection, followed by confirmation in writing within 7 days.

Measure freeboard (in feet), as measured from the top of the lowest part of the dike to the water surface elevation in each surface impoundment. The measurement must be done at a regular frequency (such as daily) to determine if sufficient freeboard exists and to provide information on the operation of the impoundment system.

6. Sludge

Collect a representative grab sample of the sludge (if present) of each surface impoundment, and analyze each sample for all COCs in accordance with the frequencies listed in Attachment A.

C. Leachate Collection and Recovery System (LCRS)

The LCRS monitoring program monitors the composition of liquids within the LCRS through the collection of liquid samples for laboratory analyses. All observations and measurements must be recorded in a permanent logbook kept onsite.

1. Monitoring Points

Each surface impoundment, the solution conveyance channel, and each heap leach pad (Phase 1) is equipped with a LCRS. The LCRS monitoring point locations are shown on MRP, Attachment B. If a LCRS is dry at the time of monitoring, this information must be recorded and reported to the Water Board in accordance with the reporting requirements of MRP, Section IV.A.

2. Monitoring Parameters and Constituents of Concern

The Discharger must monitor LCRS liquids for all COCs and monitoring parameters in accordance with the frequencies listed in Attachment A.

3. Field Parameters

The Discharger must monitor LCRS liquid for all field parameters in accordance with the frequencies listed in Attachment A.

4. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of all field monitoring equipment.

5. Inspections

Inspect the LCRS at a regular frequency (such as weekly) to determine the presence of liquids. Upon detection of liquid in a LCRS (1) at a volume greater than one-half of the Action Leakage Rate (ALR) or (2) for three consecutive liquid detections, the Discharger must immediately collect a grab sample of the liquid and analyze the sample for all COCs and monitoring parameters listed in Attachment A.

The Discharger must record, in conjunction with the regular LCRS inspection, the volume of liquid pumped from the LCRS, the pumping rate (in gallons per day), date, and discharge location(s) of liquids pumped from the LCRS.

6. Surface Impoundment Action Leakage Rates and Rapid and Large Leak Rates

The Action Leakage Rates (ALRs) and Rapid and Large Leakage Rates (RLLRs) for the WMUs (heap leach pad, solution conveyance channel, and surface impoundments) are shown in

Table 1 below. The ALRs and RLLRs for the WMUs were derived from the 1992 USEPA guidance document, *Action Leakage Rates for Leak Detection Systems, Supplemental Background Document for the Final Double Liners and Leak Detection Systems Rule for Hazardous Waste Landfills, Waste Piles, and Surface Impoundments* and USEPA, and Code of Federal Regulations (CFR), Title 40, section 264.222. The ALRs for the WMUs are based on the surface areas of the WMUs multiplied by a factor of 20. The RLLRs are calculated based on the maximum design flow rate of the leak detection system (sump dimensions and slopes) that can be removed without liquid head on the bottom liner exceeding 1 foot. Table 1 summarizes the calculations of the ALRs and the RLLRs.

Table 1. LCRS Action Leakage Rates and Rapid and Large Leakage Rates

LCRS	Surface Area (Acres)	Action Leakage Rates (gpd)	Rapid and Large Leakage Rates (gpd)
LD-1 Stage 1	0.72	14.4	1,382
LD-2 Stage 2	1.92	38.3	1,382
LD-3 ¹ Stage 3 East	2.23	44.6	1,382
LD-4 ¹ Stage 3 West	0.95	19.1	1,382
LD-5 Pump Box	0.10	2.0	189
LD-6 West Overflow Pond	2.30	46.5	1,726
LD-7 East Overflow Pond	2.90	57.8	1,726

Notes: gpd = gallons per day

¹ Surface areas, action leakage rates, and rapid and large leakage rates for LD-3 and LD-4 are estimates and will be calculated based on as-built construction.

If liquids are detected in the LCRS, the Discharger must take the response actions described in Table 2, LCRS Action and Response Levels.

Table 2. LCRS Action and Response Levels for WMUs

Unit Flow Rate	Action/Response
Less than Action Leakage Rate	Record weekly flow rate and submit recorded flow rates with the next regularly scheduled monitoring report. If detection of liquid in the LCRS (1) at a volume greater than one-half of the ALR or (2) for three consecutive liquid detections, the Discharger must immediately collect a grab sample of the liquid and analyze the sample for all COCs and monitoring parameters listed in Attachment A.
Greater than or equal to Action Leakage Rate	Notify the Water Board immediately (within 24 hours). Cease ¹ discharge to the affected WMU and repair the liner. A sample must be collected and analyzed for the COCs and the monitoring parameters identified in Attachment A.
Greater than or equal to Rapid and Large Leakage Rate	Notify the Water Board immediately (within 24 hours). Cease discharge to the affected WMU. If the surface impoundment WMU, remove the contents within the surface impoundment and LCRS until the leakage rate is no longer exceeded and repair the liner. If the heap leach pad WMU, cease stockpiling ore on the affected cell, proceed with rinsing and neutralization of partially leached ore on the affected portion of the heap leach pad or remove partially leached ore to another cell and inspect and repair the liner. A sample must be collected and analyzed for the COCs and the monitoring parameters identified in Attachment A.

Note: ¹ If the heap leach pad, cease discharge of the barren solution to the affected area.

D. Unsaturated Zone

The unsaturated (vadose) zone monitoring program monitors the composition of soil-pore liquids beneath the WMU through the collection of liquid samples for laboratory analyses and field measurements.

1. Monitoring Points

The unsaturated zone is monitored for soil-pore liquids using lysimeters located directly beneath the LCRS of each surface impoundment and along the toe of the heap leach pad. Unsaturated zone monitoring point locations (lysimeters VM-1 through VM-11) are shown on MRP, Attachment B. If a lysimeter is dry at the time of monitoring, this information must be recorded and reported to the Water Board in accordance with the reporting requirements of MRP, Section IV.A.

2. Monitoring Parameters and Constituents of Concern

The Discharger must monitor soil-pore liquids for all COCs and monitoring parameters in accordance with the frequencies listed in Attachment A.

3. Field Parameters

The Discharger must monitor soil-pore liquids for all field parameters in accordance with the frequencies listed in Attachment A.

4. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of all field monitoring equipment.

5. Inspections

Each lysimeter will be inspected monthly for the presence of liquids. If liquids are found, field verification testing and sampling must be performed within 24 hours of the detection and must include the following:

- a. Sampling of liquids from the lysimeter. If sufficient sample volume is collected, the sample must be analyzed for all COCs and monitoring parameters listed in Attachment A.
- b. Comparison of lysimeter liquid water quality to the most current water quality data for the wastewater contained within the WMUs and the liquid collected from the LCRS.
- c. Documentation that the lysimeter and other field monitoring equipment is operating properly.
- d. The Discharger must notify the Water Board in accordance with the Notice of Tentative Release requirements outlined in MRP, Section IV.C.1.

The Discharger must submit a technical report to the Water Board documenting the results of the field verification testing within 30 days of receiving the laboratory analytical results or, if no samples were analyzed, within 30 days of the date of the detection.

6. Retest and Notification

If cyanide is detected at any of the unsaturated zone monitoring points, the Discharger must perform a retest for cyanide at that monitoring point within 48 hours of detection. The Discharger

must also notify the Water Board in accordance with the Notice of Tentative Release requirements outlined in MRP, Section IV.C.1.

E. Groundwater

The groundwater monitoring program monitors the quality of groundwater that passes through the point of compliance as well as monitors the quality of groundwater upgradient, cross-gradient, and downgradient of the WMUs through the collection of groundwater samples for laboratory analysis and field measurement of water quality parameters.

1. Monitoring Points

Groundwater monitoring points are shown on MRP, Attachment B.

2. Depth to Groundwater

Prior to purging and sampling, the Discharger must measure and record the depth below the ground surface of the static groundwater elevation (feet below ground surface [bgs]) in all groundwater monitoring wells. The measurements must be accurate to the nearest 0.01 foot.

3. Groundwater Purging and Sampling

Prior to sampling, all groundwater monitoring wells must be purged using either standard or low-flow techniques until dissolved oxygen (DO), electrical conductivity, pH, temperature, and turbidity of extracted well water have stabilized. These parameters will be considered stable when three consecutive readings have pH values within +/- 0.1 pH units, temperature values within +/- two (2) degrees Celsius, and electrical conductivity values within +/- three (3) percent.

4. Monitoring Parameters and Constituents of Concern

The Discharger must monitor, at each groundwater monitoring well, all COCs and monitoring parameters in accordance with the frequencies listed in Attachment A. Should any non-monitoring parameter COC exceed their respective concentration limit by a measurably significant amount at any given monitoring point, that non-monitoring parameter COC will become a monitoring parameter at that monitoring point.

5. Field Parameters

The Discharger must monitor the groundwater for all field parameters in accordance with the frequencies listed in Attachment A.

6. Aquifer Characteristics

The Discharger must calculate, and illustrate on a site plan and/or aerial photograph, the following aquifer characteristics: the depth to groundwater (feet bgs) in each groundwater monitoring well; the static water level (feet above mean sea level) in each groundwater monitoring well; the slope of the groundwater gradient (feet/feet); the direction of the groundwater gradient beneath and around the Facility (degrees from true north); the velocity of groundwater flow (feet/year); and the current groundwater isocontours for that monitoring period.

7. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of the field monitoring equipment.

F. Storm Water Monitoring and Reporting Program

Waste in discharges of storm water must be reduced or prevented to achieve the best practical treatment level using controls, structures, and best management practices (BMPs) for areas associated with mining operations at the Facility. At minimum, the Discharger must: develop and implement a site-specific storm water pollution prevention plan (SWPPP); conduct monitoring, including visual observations and periodic collection of samples for analytical analysis; evaluate storm water monitoring data; implement appropriate response actions when monitoring data indicate non-compliance with the storm water monitoring program; and provide annual reports to the Water Board.

1. Storm Water Pollution Prevention Plan

The Discharger must develop and implement a site-specific SWPPP (or an equivalent document) that contains, at minimum, the following elements. A copy of the SWPPP (and amendments thereto) must be maintained at the Facility so as to be available to site personnel at all times. The Discharger is required to submit a copy of the SWPPP to the Water Board in accordance with the schedule specified in MRP, Section IV.D.4.

a. Facility Information

A list of site contacts including those persons responsible for assisting with the implementation of the SWPPP.

b. Site Map

A site map that illustrates: the Facility boundary; all storm water drainage areas within the Facility and the flow direction of each drainage area; locations of storm water collection and conveyance systems, including associated discharge locations and directions of flow; locations of storm water monitoring points; locations of structural control measures that affect run-on; and locations of all industrial storage areas and storage tanks, shipping and receiving areas, fueling areas, vehicle and equipment storage/maintenance areas, material handling and processing areas, waste treatment and disposal areas, cleaning and material reuse areas, and other areas of industrial activity that may have potential pollutant sources.

c. List of Industrial Materials

A list of industrial materials¹ handled at the Facility, the locations where each material is stored and handled, as well as the typical quantities and handling frequency must be included in the SWPPP.

d. Potential Pollutant Sources

A description of all potential pollutant sources including industrial processes, material handling and storage areas, dust and particulate generating activities, non-storm water discharges, and erodible surfaces.

e. Best Management Practices

A narrative description of each minimum and/or advanced BMP being implemented at the Facility, as well as a summary table that identifies each area of industrial activity, the associated pollutant sources and pollutants, and the specific BMPs being implemented.

¹ Includes, but is not limited to: raw materials, recyclable materials, intermediate products, final products, by-products, waste products, fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances; pesticides; and waste products such as ashes, slag, and sludge and that are used, handled, stored, or disposed in relation to a facility's industrial activity.

The following minimum BMPs must be implemented and maintained to reduce or prevent pollutants in industrial storm water discharges: good housekeeping; preventative maintenance; spill and leak prevention response; material handling and waste management; erosion and sediment controls; an employee training program; and quality assurance and record keeping.

Advanced BMPs may be necessary to reduce or prevent discharges of pollutants in storm water discharges in a manner that reflects best industry practice considering technological availability and economic practicability and achievability. Advanced BMPs may include exposure minimization BMPs; storm water containment and discharge reduction BMPs; treatment control BMPs; or other advanced BMPs based on site-specific criteria.

f. Storm Water Monitoring Plan

The SWPPP must include a storm water monitoring plan that meets the requirements outlined in MRP, Section II.F.2.

2. Storm Water Monitoring

a. Monitoring Points

The storm water discharge monitoring locations must be selected such that samples collected are representative of storm water discharge leaving each drainage area identified for the Facility. The storm water discharge monitoring locations must be identified on the site plan in the SWPPP.

b. Storm Water Sampling

During storm events, stormwater runoff from the site must be sampled. The Discharger must collect storm water samples from each storm water discharge monitoring location and analyze for all monitoring parameters.

All storm water samples, with the exception of pH, are to be analyzed by a California state-certified laboratory using the most recently approved SW-846 USEPA method or other equivalent USEPA method. An alternate method may be proposed and used if acceptable to the Executive Officer.

c. Visual Observations

Monthly, the Discharger must visually observe and document, during normal operating hours, each drainage area for the following: the presence or indications of prior, current, or potential non-storm water discharges and their sources; authorized non-storm water discharges, their sources, and associated BMPs; and all potential pollutant sources.

Visual observations must also be conducted at the same time that storm water sampling occurs. At the time a storm water sample is collected, the Discharger must observe and document the discharge for the following.

- i. Visually observe and record the presence or absence of floating and suspended materials, oil and grease, discolorations, turbidity, odors, trash/debris, and source(s) of any discharged pollutants.
- ii. In the event that a discharge location is not visually observed during the sampling event, the Discharger must record which discharge locations were not observed during sampling or that there was no discharge from the discharge location.

d. Monitoring Parameters

During storm events, the Discharger must monitor each storm water discharge monitoring location for all parameters in accordance with the frequencies listed in Attachment A.

e. Water Quality Thresholds

The specific water quality thresholds that apply to the storm water monitoring parameters are listed in Table 3, Storm Water Monitoring.

Table 3. Storm Water Monitoring

Parameter	Water Quality Thresholds
Copper	Storm water discharges must not contain copper at concentrations in excess of 0.3 mg/L.
Total Cyanide	Storm water discharges must not contain detectable concentrations of total cyanide.
WAD Cyanide	Storm water discharges must not contain detectable concentrations of WAD cyanide.
Lead	Storm water discharges must not contain lead at concentrations in excess of 0.6 mg/L.
Mercury	Storm water discharges must not contain mercury at concentrations in excess of 0.002 mg/L.
Oil and Grease, Total	Storm water discharges must not contain oils and greases at concentrations in excess of 25 mg/L.
pH	Measured pH must not be lower than 6.0 nor greater than 9.0.
Total Suspended Solids	Storm water discharges must not contain total suspended solids in excess of 30 mg/L.
Zinc	Storm water discharges must not contain dissolved iron at concentrations in excess of 1.5 mg/L.

f. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of any field monitoring equipment.

3. Storm Water Data Evaluation and Response Actions

The storm water monitoring data (storm water sampling and analytical data and visual observations) must be evaluated to determine the following: the effectiveness of BMPs in reducing or preventing pollutants in the storm water discharges; compliance with the monitoring parameter water quality thresholds; and the need to implement additional BMPs and/or SWPPP revisions.

The results of all storm water sampling and analytical results from each distinct sample must be directly compared to the water quality threshold for the corresponding monitoring parameter. An exceedance of one or more water quality threshold requires the Discharger to implement the following response actions:

- a. The Discharger must notify the Water Board verbally or via email within 30 days of obtaining laboratory results whenever a determination is made that a water quality

threshold is exceeded for one or more storm water monitoring parameters;

- b. Identify the pollutant sources that may be related to the exceedance and whether the BMPs in the SWPPP have been properly implemented and perform BMP maintenance, if necessary;
- c. Assess the SWPPP and its implementation to determine whether additional BMPs or SWPPP measures are necessary to reduce or prevent pollutants in storm water discharges; and
- d. Revise or amend the SWPPP, as appropriate, to incorporate the additional BMPs or SWPPP measures necessary to reduce or prevent pollutants in storm water discharges and implement the revised SWPPP no later than 60 days following the reported exceedance; or
- e. Demonstrate, to the satisfaction of the Executive Officer, that the exceedance(s) is attributed solely to non-industrial pollutant sources and/or to natural background sources.

G. Ore and Waste Rock Monitoring

The Discharger must report quantities of ore processed and must perform geochemical testing and monitoring as mining progresses of the ore and waste rock exposed to assess the potential for acid rock drainage (ARD). The reports must include the following:

1. The quantity of ore (tons) placed on the heap leach pad(s) monthly.
2. The total (cumulative) quantity of ore (tons) on the heap leach pad(s).
3. The quantity of waste rock (tons) placed in the waste rock disposal areas monthly.
4. Representative samples of recently exposed ore and waste rock from each rock type must be collected from blast hole cuttings and analyzed for Acid Base Accounting, Mineralogy, and Waste Extraction Test (WET) procedure.
 - a. A detailed sampling and analysis protocol has been prepared to assess the potential for ARD, with appropriate quality assurance/quality control (QA/QC) and data verification. The sampling and analysis protocol specifies when samples need to be collected (e.g., during specific

phases of mining, and at specific depths within a pit), and specifies the number of samples to be collected. The plan should be updated, as needed, as mining progresses and included in the site-specific SAP to be approved by the Executive Officer.

- b. Annually, the Discharger must submit the laboratory analytical results and assessment.

III. DATA ANALYSES

All data analyses methods (statistical and non-statistical) must meet the requirements of CCR, title 27, section 20415, subdivisions (e)(8) and (9).

A. Site-Specific Statistical Analysis Methods

To determine whether there is "measurably significant" evidence of any new releases from the Facility, evaluation of data will be conducted using statistical methods. For detection monitoring, the Discharger must use statistical methods to analyze COCs and monitoring parameters that exhibit concentrations that equal or exceed their respective concentration limit. The Discharger may propose and use any data analyses that meets the requirements of CCR, title 27, section 20415, subdivision (e)(7). *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (USEPA, 2009) or subsequent versions may also be used to select the statistical test to use for comparing detection monitoring data to background monitoring data.

B. Non-Statistical Analysis Methods

To determine if any releases occur from the Facility, data evaluation must also be conducted using non-statistical methods. Non-statistical analyses include the following.

1. Physical Evidence

Physical evidence can include, but is not limited to, unexplained stress in biological communities such as vegetation loss, soil discoloration, or groundwater mounding. Each quarterly and annual report must comment on such physical elements.

2. Time-Series Plots

Non-statistical evidence of a release may include trends of increasing concentrations of one or more constituents over time, as depicted in time-series plots. Each quarterly and annual report must include time-series plots. Time-series plots are not required for

parameters that have never been detected above their MDL (as specified by the applicable USEPA method).

IV. REPORTING REQUIREMENTS

The Discharger must comply with the following reporting requirements.

A. Submittal of Electronic Laboratory Data

All water, soil, ore, and storm water laboratory data collected during the corresponding reporting period, must be submitted electronically to the Water Board by uploading to the State Water Board's GeoTracker system, per the following schedule. The laboratory data must be uploaded in Electronic Data Format (EDF).

Table 4. Laboratory Reporting Schedule

Sampling and Reporting Period	EDF Upload Due Date
January 1 – March 31	April 30
April 1 – June 30	July 30
July 1 – September 30	October 30
October 1 – December 31	January 30

B. Scheduled Reports to be Filed with the Water Board

The following periodic reports, including all water and soil monitoring data collected during the corresponding reporting period, must be submitted electronically to the Water Board by uploading to the State Water Board's GeoTracker system, per the following schedule. The laboratory data must be uploaded in Electronic Deliverable Format (EDF).

Table 5. Monitoring and Reporting Schedule

MONITORING REPORTING SCHEDULE		
Report Name ¹	Sampling and Reporting Period	Report Due Date
First Quarter Monitoring Report	January 1 – March 31	April 30
Second Quarter Monitoring Report	April 1 – June 30	July 30
Third Quarter Monitoring Report	July 1 – September 30	October 30
Fourth Quarter Monitoring Report	October 1 – December 31	January 30
Annual Monitoring Report	January 1 – December 31	January 30
Annual Storm Water Report	January 1 – December 31	August 15
Five-Year Constituent of Concern Report ²	January 1 – June 30	August 15
	July 1 – December 31	February 15

Notes:

¹ Reports with same due dates may be combined.

² Sampling and reporting period will alternate between January 1 through

June 30 for one five-year sampling event and July 1 through December 31 for the next five-year sampling event. The July 30 report due date corresponds to the January 1 through June 30 sampling and reporting period; the January 30 report due date corresponds to the July 1 through December 31 sampling and reporting period. The next three-year constituent of concern report is due February 15, 2024.

1. Quarterly Monitoring Reports

Each quarterly report must include, but not be limited to, the following information.

- a. All data collected during the reporting period in accordance with the approved SAP for the heap leach pad, surface impoundments, LCRS, unsaturated zone, and groundwater monitoring, as outlined in MRP, Section II.
- b. Tabulated results of sampling and laboratory analyses for each groundwater monitoring point, including historical (last ten years at minimum) and current reporting period data, as well as the concentration limit for each monitoring parameter and an identification of each sample that exceeds its respective concentration limit by a measurably significant amount at any given monitoring point.
- c. Tabulated results of sampling and laboratory analyses for each of the following monitoring points including historical (last ten years at minimum) and current reporting period data.
 - i. All unsaturated zone monitoring points,
 - ii. All LCRS monitoring points,
 - iii. All surface impoundment monitoring points, and
 - iv. All wastewater effluent monitoring points.
- d. A map and/or aerial photograph showing the perimeters of the WMUs and ancillary facilities as well as locations of monitoring points and background monitoring points, observation stations, and the surface trace of the point of compliance.
- e. Describe, calculate, and illustrate on a map and/or aerial photograph the static groundwater surface elevation (feet above mean sea level) in each groundwater monitoring well, the groundwater gradient (feet/feet) and the direction of the groundwater gradient beneath and around the surface impoundments, the velocity of groundwater flow (feet/year),

and the current groundwater isocontours for that monitoring period.

- f. All data and visual observations associated with monitoring of the heap leach pad, surface impoundments, solution conveyance system, and an evaluation of the effectiveness of the LCRS facilities.
- g. A narrative description of any modifications to, additions to, maintenance of, or operational problems associated with the wastewater conveyance system or surface impoundment disposal facilities.
- h. Copies of all field monitoring and well sampling data sheets.
- i. Time-series plots of the analytical results from the groundwater, unsaturated zone, LCRS, and surface impoundment monitoring at each monitoring point for each COC detected during the monitoring period as well as available historical data (minimum of last ten years of data). Time-series plots must include, as horizontal lines, the COCs concentration limit as derived in accordance with the WQPS for the respective COC/monitoring point pair (if applicable), as well as the PQL and MDL for the analytical method used.
- j. A letter transmitting the essential points of each report, including a discussion of any violations found since the last
- k. report was submitted and describing actions taken or planned for correcting those violations.
 - i. If the Discharger has previously submitted a detailed time schedule for correcting violations, a reference to the correspondence transmitting this schedule will suffice.
 - ii. If no violations have occurred since the last submittal, this must be stated in the letter of transmittal.

2. Annual Monitoring Reports

Each annual report must include, but not be limited to, the following information.

- a. All data collected during the reporting period in accordance with the approved SAP for the ore and waste rock monitoring, as outlined in MRP Section II.G.

- b. A narrative of the items described in the General Provisions for Monitoring and Reporting (Attachment C of this MRP).
- c. A list of all monitoring point/monitoring parameter pairs (pairs), by medium, which have exhibited a verified measurably significant increase, together with the respective date (for each) when that increase occurred. Any pairs that have shown an increase within that (prior) year shall be bold-underlined. In addition, by medium, list any non-monitoring parameter COCs that, during testing that year (tested every three years), have exceeded their respective concentration limit by a measurably significant amount and, as a result, have become monitoring parameters, together with the date when the transition occurred.
- d. Four maps, one for each quarterly monitoring period of the last reporting year, showing (1) the groundwater elevation isocontours determined for that monitoring period, (2) all monitoring points, (3) the surface trace for each waste management unit, (4) all observation stations, and (5) the surface trace of the Facility's point of compliance. The maps must be to scale, be labeled, and include a legend.
- e. Graphical and tabular data for the monitoring data obtained for the previous calendar year (January – December). Each table must summarize the historical and most recently detected constituent concentrations for all locations sampled and compare these data to both the given monitoring point/COC pair's respective statistical concentration limit and (if applicable) MCL and be labeled appropriately. Each such graph must be plotted using raw data, and at a scale appropriate to show trends or variations in water quality. For graphs showing trends of similar constituents (e.g., volatile organic compounds), the scale must be the same.
- f. Calibration methods and any discrepancies of any meters used for field parameter evaluations after calibration is performed.
- g. An evaluation of the effectiveness of both the groundwater and unsaturated zone monitoring programs and any proposed modifications necessary to improve the detection monitoring.
- h. A brief chronological summary of dates of any operational problems and maintenance activities that may impact water quality at the site.

- i. The compliance record and the corrective actions taken or planned, which may be needed to bring the Facility into full compliance with the discharge requirements.
- j. Evidence that adequate financial assurance for (1) closure and post-closure monitoring and maintenance and (2) corrective action for all known or reasonably foreseeable releases is still in effect. Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument.
- k. Evidence that the financial assurance amount is adequate or increase the amount of financial assurance by an appropriate amount, if necessary, due to inflation, a change in the preliminary closure plan, or other unforeseen events.
- l. The Discharger must review the preliminary closure plan and corrective action plan for all known or reasonably foreseeable releases annually to determine if significant changes in the operation of the Facility warrant an update to these plans. Any proposed changes to these plans must be outlined in the annual report.
- m. The Discharger has established background concentration limits in the WQPS for detection monitoring. These limits may be revised annually and must be accepted by the Water Board. The revised limits must be included in the annual report.

3. Annual Storm Water Reports

Annual storm water reports must be submitted to the Water Board no later than **August 15** of each year in accordance with the frequency listed in Attachment A. Annual storm water reports must include, but not be limited to, the following information:

- a. All data collected during the reporting period in accordance with the storm water monitoring plan, as outlined in MRP, Section II.F.2.
- b. Tabulated results of sampling and laboratory analyses for each storm water discharge monitoring location, including historical and current reporting period data, as well as the water quality threshold for each monitoring parameter and an identification of each sample that exceeds its respective water quality threshold at any given discharge monitoring location.

- c. A copy of the current site map from the SWPPP.
- d. Copies of all field monitoring, storm water sampling, and visual observation data sheets. An explanation shall be provided in the Annual Report for uncompleted sampling event visual observations.
- e. Calibration methods and any discrepancies of any meters used for field parameter evaluations after calibration is performed.
- f. A summary of the actions taken in response to a water quality threshold exceedance, including monitoring parameter and pollutant source(s) involved, additional BMP and/or SWPPP measures taken, and associated dates and timelines for implementing the response action; or a demonstration that the exceedance(s) is attributed to a non-industrial pollutant source and/or to a natural background source.
- g. A copy of any SWPPP amendments and/or revisions for the reporting period.
- h. A summary of significant spills and/or leaks that occurred at the Facility during the reporting period and the response taken by the Discharger, including dates.
- i. A summary of employee storm water related trainings performed during the reporting period, including dates and content.

4. Five-Year Constituent of Concern Monitoring and Reporting Program

Pursuant to CCR, title 27, section 22500, and as specified in CCR, title 27, 20420, subdivision (g), every five years the Discharger must sample a suite of non-monitoring parameter COCs. Groundwater samples must be collected at all groundwater monitoring points and submitted for laboratory analyses once every five years for volatile organic compounds, semi-volatile organic compounds, and CAM-17 metals in accordance with this MRP, Attachment A. Successive monitoring efforts must be carried out alternately during January 1 through June 30 of one five-year sampling event and July 1 through December 31 of the next five-year sampling event, and every fifth year, thereafter. The five-year COC sampling event must be reported no later than 45 days following the monitoring period. The last five-year sampling event occurred the first half of 2018 and was reported in 2019; therefore, the next five-year sampling event is

scheduled to occur in second half of 2023 and reported to the Water Board no later than **February 15, 2024**.

C. Unscheduled Reports to be Filed with the Water Board

The following reports must be submitted to the Water Board as specified herein.

1. Notice of Tentative Release from the Facility

Should the statistical or non-statistical data analyses or field verification testing indicate, for any given COC, that a release is tentatively identified, the Discharger must follow these requirements.

a. Physical or Measurably Significant Evidence of a Release from the Facility

The Discharger must immediately (within 24 hours) notify the Water Board verbally whenever a determination is made that there is significant physical or “measurably significant” evidence of a release from the Facility. This verbal notification must be followed by written notification via certified mail within seven days of such determination. Upon such notification, the Discharger may initiate the verification procedures (as outlined in Order No. R6V-2021-TENTATIVE, Section III.F) or demonstrate that another source other than the surface impoundments caused evidence of a release in accordance with MRP, Section IV.B.1.b.

The notification must include the following information:

- i. The potential source of the release;
- ii. General information including the date, time, location, and cause of the release;
- iii. An estimate of the rate and volume of waste involved;
- iv. A procedure for collecting samples and description of laboratory tests to be conducted;
- v. Identification of any water body or water-bearing media affected or threatened;
- vi. A summary of proposed actions; and
- vii. For a physical evidence of a release – the physical

factors that indicate evidence of a release; or

- viii. For a measurably significant evidence of a release – the monitoring parameters and/or COCs that are involved in the measurably significant evidence of a release from the Facility.

b. Other Source That May Cause Evidence of a Release from the Facility

The Discharger may make a demonstration that a source other than the Facility caused evidence of a release. For this case, the Discharger must notify the Water Board of the intention to make this demonstration. The notification must be sent to the Water Board by certified mail within seven days of determining physical or measurably significant evidence of a release.

2. Exceeding the Leakage Rates for Surface Impoundments

Exceeding the ALRs for the surface impoundment LCRS is an Adverse Condition. The Discharger must immediately notify the Water Board verbally within 24 hours whenever a determination is made that leakage into the LCRS exceeds the ALR for the respective surface impoundment. This oral notification must be followed by written notification via certified mail within 7 days of such determination. This written notification must then be followed by a technical report via certified mail within 30 days of such determination. The technical report must describe the actions taken to abate the Adverse Condition and describe any proposed actions to abate future potential Adverse Conditions.

Exceeding the RLLRs is also an Adverse Condition. In addition to the requirements above for exceeding the ALRs, the technical report must include sampling results and a comparison of the wastewater in the surface impoundment and the leachate in the LCRS, as described in MRP, Section II.B, Table 2.

3. Evaluation Monitoring

The Discharger must, within 90 days of verifying a release, submit a technical report and amended report of waste discharge to establish an EMP pursuant to CWC, section 13267, subdivision (b), proposing an EMP meeting the provisions of CCR, title 27, section 20420, subdivision (k)(5). If the Discharger decides not to conduct verification procedures or decides not to make a demonstration that a source other than the Facility is responsible for the release, the

release will be considered verified. The EMP must include the following information:

- a. COC Concentrations – the maximum concentration of each COC at each monitoring point as determined during the most recent COC sampling event (i.e., under CCR, title 27, section 20420, subdivision (g) or (k)[1]). Any COC that exceeds its concentration limit is to be retested at that monitoring point. Should the results of the retest verify that the COC is above the concentration limit, then that COC will become a monitoring parameter at that monitoring point;
- b. Proposed Monitoring System Changes – any proposed changes to the groundwater and unsaturated zone monitoring systems necessary to meet the provisions of CCR, title 27, section 20425;
- c. Proposed Monitoring Changes – any proposed additions or changes to the monitoring frequency, sampling and analytical procedures or methods, or statistical methods used at the Facility necessary to meet the provisions of CCR, title 27, section 20425; and
- d. Proposed Delineation Approach – a detailed description of the measures to be taken by the Discharger to assess the nature and extent of the release from the Facility.

4. Engineering Feasibility Study Report

Within 180 days of verifying the existence of any new release, the Discharger must submit a revised Engineering Feasibility Study report meeting CCR, title 27, section 20420, subdivision (k)(6), proposing corrective action measures that could be taken to achieve background concentrations for all COCs involved in the release. This report will be the basis for a later expanded Engineering Feasibility Study submitted under the EMP, as specified in CCR, title 27, section 20425, subdivision (b).

5. Monitoring Well Logs

All monitoring wells (including groundwater and unsaturated zone monitoring wells) and all other borings installed to satisfy the requirements of this MRP must be drilled by a licensed drilling contractor and must be logged during drilling under the direct supervision of either a California-licensed professional geologist or civil engineer with expertise in stratigraphic well logging, as indicated in CCR, title 27, section 20415, subdivision (e)(2). Such

logs must be submitted to the Water Board within 90 days following completion of fieldwork.

6. Significant Earthquake Event

After a significant² or greater earthquake event at or near the Facility, the Discharger shall notify the Water Board within 48 hours, and within 45 days submit to the Water Board a detailed written post-earthquake report describing any physical damages to the containment features or groundwater and/or unsaturated zone monitoring systems or to report no damage to the Facility was sustained. The Discharger shall closely examine the WMUs and appurtenant piping, inspect the slope conditions, drainage control system, and surface grading for signs of cracking or depressed/settled areas following the earthquake event. If cracking or depressed areas are identified, the Discharger shall make repairs to those areas within 30 days from the date of the earthquake event. Repairs and maintenance must be consistent with Board Order No. R6V-2021-TENTATIVE.

D. Technical Reports

Pursuant to CWC, section 13267, subdivision (b):

1. Monitoring Systems Installation Report

No later than 90 days following completion of construction a monitoring system or monitoring system component, the Dischargers must submit a technical report discussing the installation of the monitoring system or component. The report shall summarize all work activities associated with the installation of the monitoring system or component. The report must be certified by a California professional civil engineer or a California professional geologist. It must contain sufficient information to verify that the construction was in accordance with State and/or County standards.

2. Sampling and Analysis Plan

At least 60 days prior to the operation of a new WMU, the Discharger must submit a revised Sampling and Analysis Plan to be accepted by the Water Board's Executive Officer, including procedures for sampling and analysis for the surface

² A significant earthquake is a seismic event classified according to the United States Geological Survey (USGS) Earthquake Hazard Program as a moderate earthquake measuring between 5 and 5.9 on the Richter scale, or higher. The Discharger may use the Modified Mercalli Intensity Scale VI or higher for equivalent ground shaking generated by a significant earthquake of Richter magnitude 5.0 or higher as contained with the USGS Earthquake Hazard Program Magnitude/Intensity Comparison chart found at <https://earthquakes.usgs.gov>.

impoundments, heap leach pads, solution conveyance channel system, LCRS, unsaturated zone, and groundwater monitoring.

3. Water Quality Protection Standards

No later than 760 days following construction (8 quarters of monitoring, plus 30 days to generate the Water Quality Protection Standard), the Discharger must propose for acceptance by the Water Board a list of monitoring parameters and constituents of concern for each new monitoring point for which a WQPS has not been established, including a data analysis method, a revised WQPS, which includes concentration limits that define background water quality for all COCs and for each Point of Compliance. The report must be certified by a California licensed civil engineer or a California licensed professional geologist.

4. Storm Water Pollution Prevention Plan

The Discharger must submit by **November 30, 2021**, a SWPPP that meets the requirements outlined in MRP, Section II.F.1. The report must be certified by a California-licensed professional geologist or civil engineer.

E. General Provisions

The Discharger must comply with Attachment C, "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made part of this MRP.

F. Failure to Furnish Reports

Any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation pursuant to CWC, section 13268.

G. Violations

If monitoring data indicate a violation of a specific requirement in these WDRs, the Discharger must report the violation in the scheduled report for the corresponding reporting period and provide information indicating the cause of violation(s) and the action taken or planned to bring the discharge into compliance.

H. Electronic Reporting Requirements

Pursuant to CCR, title 23, section 3890, the Discharger must submit reports, including soil and water data, prepared for the purpose of

subsurface investigation or remediation of a discharge of waste to land subject to Division 2 of CCR, title 27, electronically over the internet to the State Water Resources Control Board's GeoTracker system. This requirement is in addition to, and not superseded by, any other applicable reporting requirement. The Discharger must provide all monitoring reports to the Water Board, as specified in this MRP, and upload the full monitoring report into GeoTracker, as stipulated by CCR, title 23.

For all other types of documents and correspondence, please send it to the Water Board's email address at Lahontan@waterboards.ca.gov and include the WDID No. and Facility name in the subject line.

Ordered by: _____ Dated: _____
MICHAEL R. PLAZIAK
EXECUTIVE OFFICER

- Attachments:
- A. Water Quality Monitoring Program
 - B. Monitoring Network, Golden Queen Mining Co. LLC
 - C. General Provisions for Monitoring and Reporting, September 1, 1994

ATTACHMENT A – WATER QUALITY MONITORING PROGRAM

SOLUTION CONVEYANCE CHANNEL AND SURFACE IMPOUNDMENTS					
Parameter		Units	Sampling Frequency	Reporting Frequency	
Field Parameters					
Dissolved Oxygen (DO)		milligrams/Liter	Quarterly	Quarterly	
Electrical Conductivity		µmhos/cm	Quarterly	Quarterly	
pH		pH units	Quarterly	Quarterly	
Temperature		degrees Fahrenheit or Celsius	Quarterly	Quarterly	
Turbidity		NTU	Quarterly	Quarterly	
Constituents of Concern - Liquid					
Monitoring Parameters¹	Arsenic		milligrams/Liter	Quarterly	Quarterly
	Copper		milligrams/Liter	Quarterly	Quarterly
	Total Cyanide		milligrams/Liter	Quarterly	Quarterly
	WAD Cyanide		milligrams/Liter	Quarterly	Quarterly
	Iron		milligrams/Liter	Quarterly	Quarterly
	Lead		milligrams/Liter	Quarterly	Quarterly
	Mercury		milligrams/Liter	Quarterly	Quarterly
	Nitrate		milligrams/Liter	Quarterly	Quarterly
	Sulfate		milligrams/Liter	Quarterly	Quarterly
	Total Dissolved Solids		milligrams/Liter	Quarterly	Quarterly
Constituents of Concern - Sludge (CAM 17 Metals^{2, 3})					
Antimony		milligrams/kilogram	5 year	5 year	
Arsenic		milligrams/kilogram	5 year	5 year	
Barium		milligrams/kilogram	5 year	5 year	
Beryllium		milligrams/kilogram	5 year	5 year	
Cadmium		milligrams/kilogram	5 year	5 year	
Chromium		milligrams/kilogram	5 year	5 year	
Cobalt		milligrams/kilogram	5 year	5 year	
Copper		milligrams/kilogram	5 year	5 year	
Lead		milligrams/kilogram	5 year	5 year	
Mercury		milligrams/kilogram	5 year	5 year	
Molybdenum		milligrams/kilogram	5 year	5 year	
Nickel		milligrams/kilogram	5 year	5 year	
Selenium		milligrams/kilogram	5 year	5 year	
Silver		milligrams/kilogram	5 year	5 year	
Thallium		milligrams/kilogram	5 year	5 year	
Vanadium		milligrams/kilogram	5 year	5 year	
Zinc		milligrams/kilogram	5 year	5 year	

LEACHATE COLLECTION AND RECOVERY SYSTEMS				
Parameter		Units	Sampling Frequency	Reporting Frequency
Field Parameters				
Dissolved Oxygen (DO)		milligrams/Liter	Quarterly	Quarterly
Electrical Conductivity		µmhos/cm	Quarterly	Quarterly
pH		pH units	Quarterly	Quarterly
Temperature		degrees Fahrenheit or Celsius	Quarterly	Quarterly
Turbidity		NTU	Quarterly	Quarterly
Constituents of Concern				
Monitoring Parameters¹	Arsenic		milligrams/Liter	Quarterly
	Copper		milligrams/Liter	Quarterly
	Total Cyanide		milligrams/Liter	Quarterly
	WAD Cyanide		milligrams/Liter	Quarterly
	Iron		milligrams/Liter	Quarterly
	Lead		milligrams/Liter	Quarterly
	Mercury		milligrams/Liter	Quarterly
	Nitrate		milligrams/Liter	Quarterly
	Sulfate		milligrams/Liter	Quarterly
	Total Dissolved Solids		milligrams/Liter	Quarterly

UNSATURATED ZONE				
Parameter		Units	Sampling Frequency	Reporting Frequency
Field Parameters				
Dissolved Oxygen (DO)		milligrams/Liter	Monthly	Quarterly
Electrical Conductivity		µmhos/cm	Monthly	Quarterly
pH		pH Units	Monthly	Quarterly
Temperature		degrees Fahrenheit or Celsius	Monthly	Quarterly
Turbidity		NTU	Monthly	Quarterly
Constituents of Concern				
Monitoring Parameters¹	Total Cyanide		milligrams/Liter	Monthly
	WAD Cyanide		milligrams/Liter	Monthly
	Nitrate		milligrams/Liter	Monthly
	Total Dissolved Solids		milligrams/Liter	Monthly

GROUNDWATER				
Parameter		Units	Sampling Frequency	Reporting Frequency
Field Parameters				
Depth to Groundwater		feet below ground surface	Quarterly	Quarterly
Dissolved Oxygen		milligrams/Liter	Quarterly	Quarterly
Electrical Conductivity		µmhos/cm	Quarterly	Quarterly
pH		pH units	Quarterly	Quarterly
Temperature		degrees Fahrenheit or Celsius	Quarterly	Quarterly
Turbidity		NTU	Quarterly	Quarterly
Constituents of Concern				
Monitoring Parameters¹	Arsenic	milligrams/Liter	Quarterly	Quarterly
	Copper	milligrams/Liter	Quarterly	Quarterly
	Total Cyanide	milligrams/Liter	Quarterly	Quarterly
	WAD Cyanide	milligrams/Liter	Quarterly	Quarterly
	Iron	milligrams/Liter	Quarterly	Quarterly
	Lead	milligrams/Liter	Quarterly	Quarterly
	Mercury	milligrams/Liter	Quarterly	Quarterly
	Nitrate	milligrams/Liter	Quarterly	Quarterly
	Sulfate	milligrams/Liter	Quarterly	Quarterly
	Total Dissolved Solids	milligrams/Liter	Quarterly	Quarterly
Five Year Constituents of Concern				
Antimony		milligrams/Liter	5 year	5 year
Arsenic		milligrams/Liter	5 year	5 year
Barium		milligrams/Liter	5 year	5 year
Beryllium		milligrams/Liter	5 year	5 year
Cadmium		milligrams/Liter	5 year	5 year
Chromium		milligrams/Liter	5 year	5 year
Cobalt		milligrams/Liter	5 year	5 year
Copper		milligrams/Liter	5 year	5 year
Lead		milligrams/Liter	5 year	5 year
Mercury		milligrams/Liter	5 year	5 year
Molybdenum		milligrams/Liter	5 year	5 year
Nickel		milligrams/Liter	5 year	5 year
Selenium		milligrams/Liter	5 year	5 year
Silver		milligrams/Liter	5 year	5 year
Thallium		milligrams/Liter	5 year	5 year
Vanadium		milligrams/Liter	5 year	5 year
Zinc		milligrams/Liter	5 year	5 year
Semi-volatile Organic Compounds		milligrams/Liter	5 year	5 year
Volatile Organic Compounds		milligrams/Liter	5 year	5 year

STORM WATER MONITORING			
Parameter	Units	Sampling Frequency	Reporting Frequency
Parameters			
Copper	milligrams/Liter	Four qualifying storm events per year ⁴	Annual
Total Cyanide	milligrams/Liter		
WAD Cyanide	milligrams/Liter		
Electrical Conductivity	µmhos/cm		
Lead	milligrams/Liter		
Mercury	milligrams/Liter		
Nitrate	milligrams/Liter		
Oil and Grease, total	milligrams/Liter		
pH	pH Units		
Temperature	degrees Fahrenheit or Celsius		
Total Suspended Solids	milligrams/Liter		
Zinc	milligrams/Liter		

Notes:

- 1 - Laboratory analytical data is uploaded to GeoTracker quarterly, and monitoring reports are submitted quarterly.
- 2 - CAM 17 Metals as defined in California Code of Regulations, title 22, section 66261.24.
- 3 - The Discharger shall collect and analyze sludge, if the sludge is removed from the overflow pond for pond cleanout, liner repair, and/or disposal.
- 4 - A qualifying storm event is a precipitation event that produces a storm water discharge for at least one drainage area and is preceded by 48 hours with no discharge from any drainage area. The Discharger shall collect and analyze storm water samples from two qualifying storm events within the first half of each reporting year (July 1 to December 31) and from two qualifying storm events within the second half of each reporting year (January 1 through June 30). If a sufficient number of qualifying storm events do not occur within a given reporting year, the Discharger must document and report that information in the regularly scheduled Annual Storm Water Report.

µmhos/cm - micromhos per centimeter.

NTU - Nephelometric Turbidity Units.

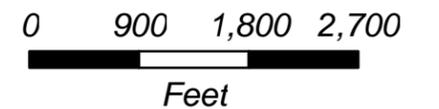
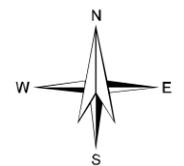
WAD - Weak Acid Dissociable.

Golden Queen Mining Co., Soledad Mountain Project – Attachment B

MONITORING AND REPORTING PROGRAM NO. R6V-2021-TENTATIVE
WDID NO. 6B159708001

Legend

- ✕ Destroyed
- Vadose Zone Monitoring Lysimeter
- Monitoring Well
- Private Well
- Production Well
- Leak Detection Collection System Sump
- ▭ Phase 1 Heap Leach Pad
- ▭ Phase 2 Heap Leach Pad
- - - Approved Project Boundary
- Pit Boundary



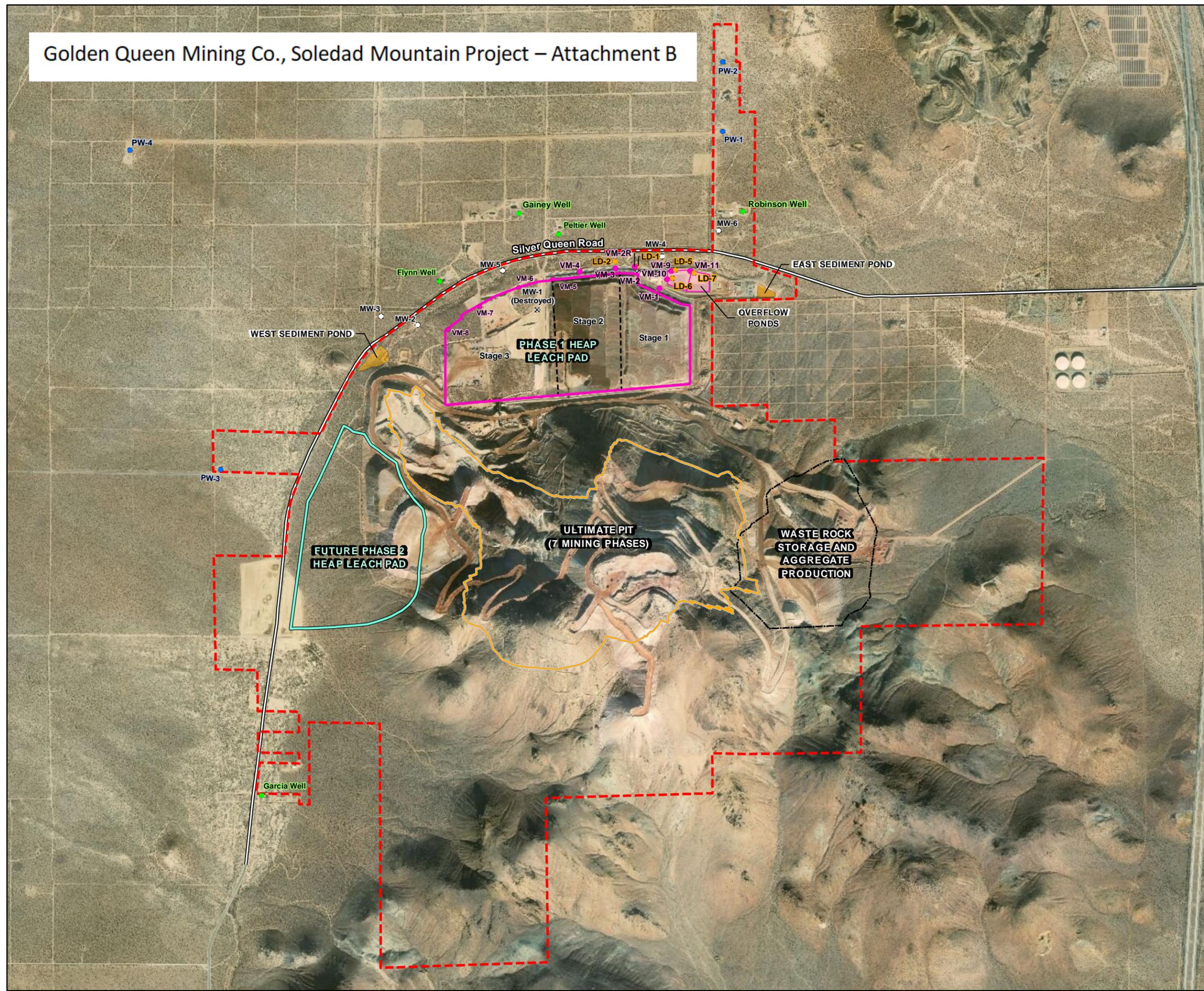
Aerial Source: Google Earth Imagery, dated in 04/2015.
Projection: NAD1983, StatePlane California V,
FIPS 0405, Feet

GOLDEN QUEEN MINING CO., LLC
SOLEDAD MOUNTAIN MINE
KERN COUNTY, CALIFORNIA

Monitoring Network



CITY: Boulder, CO DIV/GROUP: AIT PM: T. COX TM: TR: J.CHEN
Project (Project #): A0000100.0012 Path: K:\A0000100_Soledad\GIS\ArcMap_MXD\QuarterlyMonitoringReport\Fig_1_Monitoring_Well_Locs.mxd Last Saved: 10/9/2019 Saved By: akens



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

GENERAL PROVISIONS
FOR MONITORING AND REPORTING

1. **SAMPLING AND ANALYSIS**

- a. All analyses shall be performed in accordance with the current edition(s) of the following documents:
 - i. Standard Methods for the Examination of Water and Wastewater
 - ii. Methods for Chemical Analysis of Water and Wastes, EPA
- b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Regional Board Executive Officer. Specific methods of analysis must be identified on each laboratory report.
- c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The methods used shall also be reported. If methods other than EPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.
- d. The Discharger shall establish chain-of-custody procedures to insure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage, and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.
- e. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall insure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.
- f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.
- g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

Pursuant to California Water Code Section 13267(b), the Discharger shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

b. Operational Log

Pursuant to California Water Code Section 13267(b), an operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

- a. For every item where the requirements are not met, the Discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit a timetable for correction.
- b. Pursuant to California Water Code Section 13267(b), all sampling and analytical results shall be made available to the Regional Board upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.
- c. The Discharger shall provide a brief summary of any operational problems and maintenance activities to the Board with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.
- d. Monitoring reports shall be signed by:
 - i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;
 - ii. In the case of a partnership, by a general partner;
 - iii. In the case of a sole proprietorship, by the proprietor; or

- iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.
- e. Monitoring reports are to include the following:
 - i. Name and telephone number of individual who can answer questions about the report.
 - ii. The Monitoring and Reporting Program Number.
 - iii. WDID Number.
- f. Modifications

This Monitoring and Reporting Program may be modified at the discretion of the Regional Board Executive Officer.

4. NONCOMPLIANCE

Under Section 13268 of the Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation under Section 13268 of the Water Code.

x:PROVISIONS WDRS

file: general pro mrp