CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

BOARD ORDER NO. R6V-2010-0031
WDID NO. 6B159708001

WASTE DISCHARGE REQUIREMENTS FOR THE BUREAU OF LAND MANAGEMENT AND THE GOLDEN QUEEN MINING COMPANY, INC. SOLEDAD MOUNTAIN PROJECT

Kern County

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

1. Discharger

Golden Queen Mining Co., Inc. (Golden Queen) plans to construct and operate the Soledad Mountain Project located approximately two miles west of State Highway 14 on the south side of Silver Queen Road in Kern County. The project will be an open pit mining operation, which will utilize conventional open pit mining methods and the cyanide heap leach and Merrill-Crowe processes to recover gold and silver from crushed ore. The project will also process approximately 19 million tons of waste rock as aggregate and construction materials. The project facilities will be 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 Bureau of Land Management (BLM), as shown on Attachment A of this Board Order (Order). For the purposes of this Order, Golden Queen (Owner, Landowner, and Operator), and the BLM (Landowner) are collectively referred to as the "Discharger."

Naming the BLM as a Discharger in this Order is consistent with past determinations made by the Regional Water Boards and the State Water Resources Control Board (State Water Board). Hereinafter, the term "Discharger" is used to assign primary responsibility to Golden Queen and secondary responsibility to the BLM. If Golden Queen fails to meet the requirements of this Order, the BLM will become the primary responsible party for complying with the requirements of this Order. The requirements may include cleanup and abatement of the effects of any pollution, threatened pollution, or nuisance associated with waste discharges at the Facility.

2. Order History

On October 30, 1997, Golden Queen submitted a Report of Waste Discharge (ROWD) for construction and operation of the Soledad Mountain Project. On March 5, 1998, the Water Board adopted Board Order No. 6-98-009 WDID No. 6B159708001 setting the Waste Discharge Requirements (WDRs) for the construction and operation of the Soledad Mountain Project. The 1998 WDRs are specific to two heap leach pads with stockpiles of crushed ore (referred to as "Waste Piles") and seven internal solution impoundments (referred to as "Impoundments"). Although the Water Board issued WDRs, Golden Queen did not construct or operate the mine.

Because Golden Queen has since updated the project design to incorporate technological and process enhancements and improve the heap leach facility layout, eliminating the need for in-heap solution impoundments, Board Order No. 6-98-009 no longer reflects the project and is being rescinded as part of the Board's action on this permit. Additional project design revisions included modifying the mine plan to incorporate backfilling of waste rock in mined-out phases of the open pits to accommodate new reclamation requirements introduced in 2002 by the State for certain types of open pit metal mines. On March 8, 2007, Golden Queen submitted a revised ROWD for construction and operation of the Soledad Mountain Project, incorporating the design changes. The Water Board determined the revised ROWD complete on April 11, 2007.

3. Reason for Action

The Water Board is adopting new WDRs to impose requirements for the construction and operation of the Soledad Mountain Project. These requirements include monitoring and reporting.

4. Facility

The Soledad Mountain Project, as proposed, 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, 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 receive NaCN solution, which include the 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.

5. Facility Location

The Facility is located approximately two miles west of State Highway 14 on the south side of Silver Queen Road in Kern County within: (1) Section 32, T11N, R12W, 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 C of this Order shows the Facility location.

6. Existing Site Conditions/ Land Use

Currently, land uses in the general project vicinity include sparsely scattered single-family residences, open space predominantly covered with native vegetation, and various industrial facilities that remain from historical precious metals mining operations.

7. Description of Proposed Facility Components

a. Open Pits

The mine plan includes five mining phases that will be mined during the first twelve years of the mine life, producing approximately 51.2 million tons of ore and 108.4 million tons of waste rock. It is expected that 19.0 million tons of waste rock will be sold as aggregate and construction materials and 89.4 million tons will be managed on site. Golden Queen proposes to sell the leached and rinsed residues (Group C) for other uses such as aggregate.

Attachment D of this Order shows the proposed ultimate open pit configuration for the five mining phases. The ultimate pit wall configuration will consist of 20-foot wide safety benches at 60-foot vertical intervals with a maximum overall slope angle of 55 degrees. The open pit bottom elevations for each mining phase are shown below.

OPEN PIT BOTTOM ELEVATIONS	
Mining Phase[1]	**Open Pit Bottom Elevation[2] (feet)**
1	2,780
2	2,920
3	3,220
4	2,940
5	2,860
6	Not determined
7	Not determined

[1] Phases 6 and 7 are future potential. [2] Elevation above mean sea level.

b. Heap Leach Pads

Two heap leach pads are proposed for the Facility, Phase 1 pad and Phase 2 pad, which are dedicated, single use, conventional pads with cells separated by internal divider berms for solution management. The Phase 1 pad will be constructed first, followed by the Phase 2 pad once the Phase 1 pad nears capacity or as contingency capacity to facilitate enhanced metal recovery in the event this is required by the heap leach process.

The Phase 1 heap leach pad is designed to contain approximately 51.2 million tons of ore and covers an approximate area of 205 acres. The Phase 1 pad will be constructed in two or three stages. The Phase 2 pad covers an area of approximately 92 acres and will be designed with a nominal capacity of 25 million tons. Crushed ore will be stacked on the Phase 1 heap leach pad to an ultimate height of 200 feet above the liner in 33-feet high controlled lifts.

Detailed design of the Phase 2 heap leach pad will be completed only after consideration of the operational experience gained from the Phase 1 pad.

c. Surface Impoundments

The surface impoundments consist of a pump box and overflow pond. Attachment E and Attachment F of this Order show the general arrangement of the pump box and the layout of the overflow pond, respectively.

The pump box is a reinforced concrete box structure with three compartments for the management of pregnant, barren, and recycle process solutions. The pregnant and recycle solution compartments each have an approximate capacity of 16,100 gallons, and the barren solution compartment has an approximate capacity of 42,300 gallons. Each compartment will have dedicated pumps to allow for distribution of barren and recycle solutions to the heap and pregnant solution to the Merrill-Crowe plant. Solutions from the heap leach pad will flow by gravity to the pump box via one of two pipes that lie in a lined solution conveyance channel. Any overflow from the pump box will be routed to the downstream overflow pond via a lined channel.

The capacity of the overflow pond was determined using a probabilistic water balance simulation, to provide a total volume of 27.8 million gallons, allowing for operational upsets and extraordinary rainfall events. In the event of a power failure, the overflow pond will store up to 8 hours of draindown volume and the runoff from a 1,000-year, 24-hour storm event for the entire lined area.

d. Precious Metals Processing Plant and Chemical Storage Areas

All NaCN solution storage tanks, pumps, pipes, and process equipment are designed with secondary containment. Varied forms of secondary containment will be used, including synthetic liners, concrete slabs, curbed concrete containment areas and piping within piping systems. A liner system installed beneath the Merrill-Crowe plant will seamlessly connect to the overflow pond to contain potential spills. Hoods will collect and direct all furnace exhaust fumes to a dry dust suppression system (i.e., baghouse). Chemicals and reagents will be stored in closed, weatherproof containers in secure, open-air or well-ventilated storage areas with secondary containment as required by the Unified Program implemented by the Kern County Environmental Health Services Department. All containers will be properly labeled as required under the Unified Program.

e. Waste Rock Disposal Areas

During the initial mine life, a total of 108.4 million tons of waste rock will be mined and disposed of at the nominal rate of 9.45 million tons per year. The design and operational plans for the waste rock facilities are such that the bulk of the waste rock (57 percent) will be backfilled into mined-out phases of the open pits and another 17 percent will be stockpiled and sold as aggregate. The remaining waste rock will be used to construct a level pad for the aggregate operation.

f. Fuel Storage

Fuel will be received in bulk and lubricants will be received in steel drums or plastic cubes. Diesel fuel and gasoline will be stored in 10,000-gallon and 1,000-gallon aboveground steel storage tanks, respectively. The tanks will be double-walled tanks designed to the standards required by the Unified Program implemented by the Kern County Environmental Health Services Department. Golden Queen will prepare a Spill Prevention Control and Countermeasure Plan to be kept at the tank location. Other petroleum products will be stored in their shipping containers within secondary containment, such as lined bermed areas or concrete sumps within the workshop building or the warehouse yard.

g. Sanitary and Solid Waste

Sanitary facilities will be included in the workshop. Effluent from the sanitary facilities will flow by gravity to a septic tank and then to an engineered leach field designed according to the standards set by the Kern County Environmental Health Services Department and located just north of the workshop/warehouse. Portable toilets will be placed in areas not directly

served by the permanent facilities, and moved periodically as operations dictate. Authorized personnel will remove wastes on an as-required basis and disposed of in an approved manner.

Handling and disposal of solid waste produced on site will be in accordance with all applicable regulations. Portions (small cells) of the waste rock dumps may function as a solid waste facility for disposal of certain general, non-hazardous wastes such as debris from the demolition of miscellaneous, old structures. During construction and operation domestic waste will be collected and removed from the site for disposal in the Mojave landfill.

Solvents, waste oil, contaminated fuel and other similar residues from the workshop will be collected in a waste oil tank located in the immediate vicinity of the workshop and will typically be recycled or disposed of in an approved manner. Used oil filters will be drained and recycled.

8. Description of Process Steps

a. Mining

Conventional, open-pit mining methods will be used to extract ore and waste rock. Mining operations will include drilling, blasting, loading and hauling. At full production, ore and waste rock will be mined at the nominal rate of 4.55 million tons and 9.45 million tons per year, respectively.

Blasting will be done in accordance with Mining Safety and Health Administration regulations as set out in 30 Code of Federal Regulations in sections 77.1301 to 77.1304. Ammonium nitrate and fuel oil will be the primary blasting agent. Front-end loaders will load trucks with the blasted, run-of-mine ore and waste rock. Ore will be crushed in the primary crusher and either hauled by truck or conveyed by pipe conveyor to a coarse ore stockpile.

Waste rock will be hauled by truck to the designated waste rock management units. The bulk of the waste rock will be backfilled in mined-out phases of the open pits and the remainder either used for onsite construction or sold as construction materials or aggregate.

b. Processing

Crushing and screening will reduce run-of-mine ore to 100 percent minus 1⅜ inch. Temporary coarse ore and fine ore stockpiles with live capacities of 6,600 tons and 3,300 tons, respectively, will provide flexibility in the crushing/screening plant. Cement will be added to the crushed ore as a binder for good permeability and pH control. The crushed ore will be

conveyed to the heap by overland conveyor. Barren process solution will be used to wet the ore with a system of belt plows installed on the first three moveable conveyors. Moveable conveyors and a radial stacker will be used to stockpile the ore on the leach pads.

A NaCN solution with cyanide concentrations ranging from 150 milligrams per liter (mg/L) to 300 mg/L and pH values between 10 and 11 will be applied to the ore via drip emitters at the design flow rate of approximately 4,400 gallons per minute (gpm) and and application rate of 0.004 gpm per square foot. Process solution will percolate through the ore on the heap to dissolve the precious metals. The pregnant solution will be collected at the base of the heap in the solution collection pipes and drain to the toe of the heap. Pregnant solution will then flow to the pump box in one of two pipes contained within the double-lined solution conveyance channel.

c. Gold and Silver Recovery

During active leaching operations, a zinc precipitation process (referred to as the Merrill-Crowe process) will be used to recover precious metals from the pregnant solution. Zinc dust will be metered into the deaerated solution via a zinc slurry cone where it will combine with the cyanide in a rapid, cementation-type reaction. Gold and silver will be precipitated as micron-sized particles of metallic gold and silver. Following the precipitation process, all subsequent processing will take place in the refinery.

In the refinery, the pregnant solution will be pumped through plate and frame filters to remove the gold and silver particles as a precipitate, at which point the solution is termed barren. The barren solution will flow to the pump box and then be pumped to the heaps where the solution will be reapplied. A retort will be used to remove mercury from the precipitate by heating to volatilize the mercury, which is then condensed and collected in a mercury trap for sale to the commercial market. Following this process, the dry precipitate will be mixed with selected fluxes in an induction furnace where impurities in the melt combine with the slag, which will be tapped as required and poured into slag pots. Slag will then be cooled and crushed, and occluded particles of gold and silver recovered by gravity for further processing. The molten mix of gold and silver (i.e., the doré) will be poured into molds, cooled, cleaned and shipped to a commercial refinery where gold and silver bullion will be produced for final sale.

The Merrill-Crowe circuit will be shut down once cyanide concentration drops below 150mg/L during rinsing and neutralization and a set of carbon columns will be required to recover residual gold and silver. Gold will be leached until cyanide concentrations drop to approximately 1mg/L. The rate at which silver will be leached slows at cyanide concentrations of 50mg/L and stops at approximately 10mg/L.

In the carbon process, the pregnant solution is pumped to a series of tanks (carbon columns) holding activated carbon. As the pregnant solution flows through the carbon, precious and other metals, such as copper and zinc, are adsorbed from solution onto the carbon. When the carbon reaches its metal loading capacity, it is transferred from its column to a stripping vessel. In the stripping cycle, a hot caustic soda and NaCN solution is circulated at a low flow rate through the carbon, releasing the precious metals from the carbon to the caustic solution. This solution flows through an electrowinning cell where the precious metals are deposited onto cathodes. The cathodes are cleaned to yield a gold-silver sludge, which is further processed in the refinery to produce a doré as before.

d. Process Solution Flows

Barren solutions from the Merrill-Crowe plant will flow to the pump box where make-up water is added. The NaCN concentration and pH value are adjusted as noted on Finding 8(b), the solution is then pumped back to the top of the heaps for continued leaching.

9. Description of Wastes

a. Ore on the Heap Leach Pads

Crushed ore will be stockpiled on the heap leach pads and will contain varying levels of NaCN solution. Cement will be added to the crushed ore as a binder and to control the pH of the process solutions.

The lithologies that will be mined are rhyolite porphyry and flow-banded rhyolite (68.1 percent), pyroclastics (10.5 percent) and quartz latite porphyry (21.3 percent). Minor quantities of siliceous vein ore (0.1 percent) will also be mined. The various rock types are quite similar in chemical composition, and are high in silica with little or no clay. Gold occurs as native gold and electrum (gold with greater than approximately 20 percent silver). Silver occurs principally as the mineral acanthite, with some electrum, native silver, pyrargyrite and polybasite. Pyrite, galena and chalcopyrite are present in minor amounts.

b. Waste Rock

The waste rock is the barren rock and/or rock with non-economic gold and silver grades, which must be removed to expose the ore. The waste rock occurs in the same lithologies as the ore described above.

c. Process Solution

The process solution is a dilute NaCN solution. During operations, the process solution will typically contain concentrations ranging from 150 mg/L to 300 mg/L NaCN, and will be high in total dissolved solids with a high pH.

d. Sanitary Waste

Effluent from the sanitary facilities will flow by gravity to septic tanks and an engineered leach field.

e. Solid Waste

Solid waste is comprised of office waste and certain general, non-hazardous wastes such as scrap metal and debris from the demolition of miscellaneous, old structures.

f. Petroleum-based Waste

Petroleum-based waste is comprised of solvents, waste oil, contaminated fuel and other similar residues from the workshop.

10. Description of Waste Management Units (WMUs)

a. Heap Leach Pads

The crushed ore stockpiled on the heap leach pads is classified as a Group B mining waste pursuant to section 22480, Title 27, California Code of Regulations. The ore on the heaps and pads have been designed and will be constructed as Group B waste piles with engineered liner systems to prevent the waste from contacting the underlying land surface.

b. Surface Impoundments

The surface impoundments, which consist of a pump box and overflow pond, are a connected system. The pump box and overflow pond are designed and will be constructed as Group B surface impoundments. Their designs include engineered liner systems and provide capacity for containment of process solutions with zero discharge. The process solution is classified as a Group B

mining waste pursuant to section 22480, Title 27, California Code of Regulations.

c. Waste Rock Facilities

The waste rock mined to expose ore will be dumped at its angle of repose with final composite slopes not to exceed 2H:1V, primarily in mined-out phases of the open pit or placed in designated areas outside the ultimate pit boundary as either construction materials or stockpiled for sale as aggregate. The waste rock is classified as Group C mining waste pursuant to section 22480, Title 27, California Code of Regulations. The waste rock piles have been designed and will be constructed as Group C waste piles.

11. Description of WMU Liner Systems

Heap Leach Pads

The liner system for the heap leach pads consists of a single composite liner (i.e., a geomembrane in direct contact with a soil liner) to provide containment of the process solutions. From the top down, the liner system consists of the following components:

1) Process solution collection is comprised of a 2-feet thick protective drainage layer of crushed rock or ore with a network of solution collection pipes;

2) 80-mil (where 1 mil equals 0.025 millimeters) thick linear, low-density polyethylene (LLDPE) geomembrane; and

3) 1-foot thick soil liner.

The soil liner will be constructed of either onsite historical tailings and native soils amended with bentonite, or historical tailings amended with native clayey soils. The amended tailings when compacted yield a permeability of less than $1x10^{-6}$ centimeters per second (cm/sec). The 80-mil LLDPE combined with compacted, amended tailings provides a resilient, composite liner system for containment of process solutions. A drainage layer, consisting of competent ore or waste rock crushed to minus 1½-inch, will be provided as a cushion to protect the geomembrane from damage when crushed ore is stockpiled on the pads and to augment solution collection. The discharger will use low ground pressure equipment to avoid damage to the geomembrane.

The hydraulic head above the liner will be 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 (LDCS) and vadose zone monitoring system along the downgradient toe of the pad. Attachment G and Attachment H of this Order show the layout of the solution collection pipes for the Phase 1 pad and the typical details of the liner system, respectively.

A lined solution conveyance channel runs along the northern edge of the Phase 1 heap leach pad (Attachment H). Process solutions collected in the leach pad pipe network will be conveyed to the pump box by gravity flow in 15-inch diameter high-density polyethylene (HDPE) pipes that lie in the lined channel. The lined channel therefore provides a second level of containment. Specifically, the solution conveyance channel liner system consists of the following components, from the top down:

1) 80-mil HDPE upper primary geomembrane;

2) Highly transmissive HDPE geonet LDCS drainage layer;

3) 60-mil HDPE lower secondary geomembrane; and

4) 1-foot thick soil liner.

b. Surface Impoundments

The concrete pump box is single-lined with an HDPE geomembrane welded to the liner in the solution conveyance channel, and will be set in a lined sump to provide a second level of containment. The liner system for the pump box area consists of the following components, from the top down:

1) 1-foot thick cushion layer of fine sand or gravel (non angular);

2) 80-mil HDPE geomembrane; and

3) 1-foot thick soil liner.

The 1-foot cushion layer of sand or gravel (non-angular) will protect the HDPE geomembrane liner system from the weight of the concrete box. The geomembrane liner will be founded on a 1-foot thick, amended soil liner compacted to attain a permeability of $1x10^{-6}$ cm/sec or less.

The composite liner design for the overflow pond consists of a double synthetic liner with an integrated LDCS and considers harsh UV radiation conditions. Specifically, the pond liner system consists of the following components, from the top down:

1) 80-mil HDPE upper primary geomembrane;

2) Highly transmissive HDPE geonet LDCS drainage layer;

3) 60-mil HDPE lower secondary geomembrane; and

4) 1-foot thick soil liner.

The 80-mil HDPE upper geomembrane was selected as the primary containment liner due to its superior UV resistance.

Attachment F of this Order shows the liner detail for the overflow pond.

12. Description of Leak Detection and Collection System (LDCS)

The primary leak detection system is a double-lined system with an LDCS included between the liners with sufficient capacity to allow for monitoring of leakage through the primary liner. The lower liner consisting of 60-mil HDPE will be placed over the soil liner and then overlain with a high-flow capacity geonet to serve as the collection medium. The upper liner will be 80-mil HDPE constructed in a continuous manner with the heap leach pad synthetic liner. An LDCS sump will be included at the downgradient boundary of each stage or cell of the pad where collection pipes tie into the main pipelines, which lie in the lined solution conveyance channel. Attachment I of this Order shows details for the leak detection system.

The overflow pond liner system incorporates an integrated LDCS. Should leakage occur through the upper liner, it will be collected in the highly transmissive LDCS layer and routed (via gravity flow) to an LDCS sump. Riser pipes will withdraw any solution collected in the LDCS sump. The risers consist of 12-inch diameter, HDPE pipes, with slotted sections in the sump area. Solution is recovered via an automated submersible pump installed in the riser. Solutions will be discharged back into the overflow pond.

13. Description of the Vadose Zone Monitoring System

a. Heap Leach Pads

In addition to the leak detection system, a vadose zone monitoring system has been designed to monitor for solution excursions in the shallow alluvial

formation materials at ten points along the Phase 1 heap leach pad and the overflow pond. The vadose zone monitoring system consists of a series of lysimeters installed approximately 5 feet inside the pads and 25 feet below grade along the toe of the pads. Each individual system consists of a protective casing, collection tubing, and lysimeter. A lysimeter will be located at the end of the primary solution pipe from each stage or cell, and at the midpoint of each stage or cell toe berm. Attachment J and Attachment K of this Order show the proposed lysimeter locations for the Phase 1 leach pad and the lysimeter installation details, respectively.

b. Surface Impoundments

Vadose zone monitoring for the surface impoundments consists of lysimeters placed directly below the LDCS sumps at the pump box and overflow pond at an approximate depth of 25 feet.

14. Description of the Groundwater Monitoring System

Background groundwater quality is being measured in monitoring wells MW-2, MW-3, and MW-5 (Attachment MRP-2). MW-1 will be properly abandoned prior to the construction of Stage 2 of the Phase 1 heap leach pad. Wells MW-4 and MW-5 were installed at the northern perimeter of the proposed Phase 1 heap leach pad in 2007. MW-4 is completed to a depth of 177 feet and groundwater has not been detected in the well because the well is approximately 50 feet above the regional water table in the alluvial aquifer. The borehole for MW-4 was terminated because it encountered bedrock, which is an apparent localized "bedrock high". MW-5 is completed at a depth of 272 feet. Attachment MPR-2 shows the existing wells MW-1 through MW-5. The groundwater-monitoring program is further described in Monitoring and Reporting Program R6V-2010-0031 which is made part of this Order.

15. Stormwater Discharges

Waste in discharges of storm water must be reduced or prevented to achieve the best practicable treatment level using controls, structures, and management practices. The Applicant shall comply with all requirements (with the exception of purely administrative requirements, e.g., filing a Notice of Intent) contained in State Water Board's *Waste Discharge Requirements For Discharges of Storm Water Discharges Associated With Construction Activity, General Permit No. CAS00002* and *Waste Discharge Requirements For Discharges of Storm Water Associated With Industrial Activities, General Permit No. CAS00001* and all subsequent revisions and amendments.

These requirements do not preclude the Applicant from requirements imposed by municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to separate storm sewer systems or other water, conveyances and water bodies under their jurisdiction.

16. Waste Classification

The crushed ore stockpiled on the heap leach pads and the NaCN process solutions are classified as Group B mining wastes. The waste rock is classified as Group C mining waste. These classifications are in accordance with the definitions of mining waste contained in section 22480, Title 27, California Code of Regulations.

17. Authorized Disposal Sites

The only authorized disposal sites for crushed ore are the Phase 1 and Phase 2 heap leach pads. The only authorized disposal sites for the NaCN process solutions are the two heap leach pads and the surface impoundments.

18. Water Quality Protection Standards

A Water Quality Protection Standard (WQPS) is required for the Facility by this Order, and consists of constituents of concern, concentration limits, monitoring parameters, monitoring points, and points of compliance. The WQPS applies over the active life of the Facility, the closure and post-closure maintenance period, and the compliance period. The constituents of concern, monitoring points, and points of compliance are described in the Monitoring and Reporting Program, which is made part of this Order.

19. Closure and Post-Closure Maintenance

The Discharger has submitted a Preliminary Closure and Post-Closure Maintenance Plan in accordance with Division 2, subdivision 1, chapter 4, subchapter 4, section 21769, Title 27, California Code of Regulations. The discharger will submit a Final Closure and Post-Closure Maintenance Plan upon notification of closure, no later than 180 days before beginning any final closure activities. Key aspects of the preliminary plan are outlined below.

a. Heap Leach Pads

1) Neutralization

The basic approach to reducing the cyanide concentrations is to allow natural processes to occur and to perform a staged rinse with

fresh water. The rinsing and neutralization process will involve application of fresh water for short periods and then allowing the rinsed areas to drain and "rest." Periods of "rest" will assist in the natural degradation of cyanide. Hydrogen peroxide or an equivalent oxidizing agent may be used to accelerate the neutralization process, if necessary.

The recirculation system (pump box and pumps, distribution pipes, drip emitters and network of solution collection pipes) used during operations will be used to apply the rinse solutions to the leached residues. The heap leach pad design provides internal berms to separate individual cells, allowing active leaching of crushed ore in some cells to continue after rinsing of leached residues in other cells has started.

The proposed method of neutralization is commonly used in the industry. Should new methods be proven prior to development of the Final Closure and Post-Closure Maintenance Plan, the Discharger may revise the current proposal to incorporate such technologies.

2) Evaporation

The addition of fresh water to rinse the leached residues must be balanced by losses due to evaporation. Mean annual evaporation in the project vicinity is approximately 80 inches versus a mean annual rainfall of 5.74 inches; therefore, rapid solution losses due to evaporation are expected. Once neutralization is complete, all solutions draining from the heap or remaining in the overflow pond will be disposed of through evaporation.

3) Sampling and Analysis

Solutions from each stage or cell of the heap will be sampled weekly and taken to the onsite assay laboratory for analysis. The samples will be analyzed for gold, silver, pH and free cyanide. The analyses will be used to control and direct the rinse solutions to various parts of the heap.

The Final Closure and Post-Closure Maintenance Plan will include a sampling and analysis protocol, which will include a program to recover representative samples of the leached and rinsed residues from the heap. The protocol will provide a list of elements for which the samples are to be analyzed, the analytical procedures to be used and an agreed basis for recording and analyzing data and drawing conclusions.

The concentration limits for cyanide in the leached residues and rinse solutions set by the Water Board are listed in section IV.D.3 of this Order. Rinsing and neutralization of the leached residues will continue until these targets are met. The Water Board will reclassify the rinsed residues from a Group B mine waste to a Group C mine waste once the residues (including any residual salts) are rinsed and the concentration limits established in section IV. D. of this Order have been met.

4) Regrading, Soil Placement and Revegetation

Golden Queen proposes to sell the leached and rinsed residues (Group C) for other uses. Therefore, reclamation details will be determined by the volume of residues that remain onsite. A dozer will be used to reslope the sides of the heaps to comply with section 3704.1, Title 14, California Code of Regulations and rework the crests so that these blend with the natural topography. The initial contouring is designed to control drainage and minimize erosion. Revegetation will provide long-term stability, reduce visual contrasts and provide wildlife habitat.

If the sale of the leached and rinsed residues and other material resulting from the mining operation does not occur, Golden Queen must submit a revised report of waste discharge that includes an approved reclamation plan that details the management of all the onsite mining derived materials and complies with section 3704.1, Title 14, California Code of Regulations.

The lined solution conveyance channel running along the northern edge of the Phase 1 heap leach pad will be filled with waste rock, covered with growth media and seeded. Prior to these reclamation activities, the channel will be checked to ensure that there are no residual (including any residual salts) solids on the liner. Any residues will be disposed of as described below for the overflow pond.

b. Surface Impoundments

Any residuals solids in the overflow pond, pump box, or the conveyance channel will be tested. The method of disposal and the classification of the solids will be determined based on the laboratory analysis. Based on the laboratory analysis, any hazardous materials will be disposed of off-site at an appropriate disposal facility in accordance with applicable regulations. Designated waste will be returned to the heap or will remain in the impoundments for burial. The solution pumps and the supporting

steel in the pump box will be dismantled and removed offsite. The upper three feet of concrete will be broken up and placed in the bottom of the pump box. Both surface impoundments will be filled with waste rock, covered with growth media and seeded. The overflow pond will be converted to an Evapotranspirative (ET) cell that will allow the overflow pond liner system to remain fully intact at closure and allow residual seepage to either evaporate from the surface of the shallow ET cell or transpire within the root zone of native plants species planted in the ET cell.

c. Waste Rock Facilities

The crests of the waste rock dumps will be reworked with a dozer to eliminate straight lines so they blend with the natural topography. The waste rock dump slopes will be recontoured to 2H:1V or approximately 27°. The contouring is designed to provide stable surfaces and to control and minimize erosion. Revegetation will then proceed, which will include seeding with seed that has been collected and stored on site. Revegetation will provide longer-term stability, reduce visual contrasts and provide wildlife habitat.

d. Miscellaneous Disturbed Areas

All process equipment will be removed upon final site closure. Permanent structures will be dismantled and removed or converted to another continuing, beneficial use. Foundations will be broken up and covered with clean fill to a minimum depth of one foot. All surplus materials and storage containers will be recycled or disposed of offsite. Any remaining reagents will be returned to vendors. Disturbed areas will be ripped with a dozer or scarified with a grader and seeded.

Once monitoring is no longer required, the monitoring wells will be abandoned according to applicable regulations. Septic tanks and piping will be removed with no further reclamation of the leach field required.

20. Reasonably Foreseeable Release

The Discharger is required to provide financial assurance for remediation of a reasonably foreseeable release. This Order acknowledges the Discharger prepared: (a) a plan for initiating and completing corrective action for a known or reasonably foreseeable release from the Facility; and (b) a lump sum estimate of the costs to carry out the actions necessary to perform the corrective action.

21. Financial Assurance

Section 22510, Title 27, California Code of Regulations requires the Discharger to provide funds to cover the costs of closure, post-closure maintenance, and remediation of a reasonably foreseeable release at the Facility. This Order requires that proof of financial assurances that complies with section 22510(f) Title 27 is in a form acceptable to the Water Board and that updated cost estimates be submitted to the Water Board annually.

22. 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 along Silver Queen Road.

23. Climate

The project is located in one of the hottest and driest areas in the United States, the western Mojave Desert, with annual precipitation and evaporation rates of approximately 5.74 inches and 80 inches respectively. The maximum expected 100-year, 24-hour storm precipitation is 3.6 inches.

24. Site Geology

a. Setting

Soledad Mountain is located in the Western Mojave Geomorphic Province of Southern California and is of Middle to Late Miocene age. The Soledad Mountain mineral deposit is hosted in a volcanic sequence of rhyolite porphyry and flow-banded rhyolite, pyroclastics and quartz latite porphyry that form a large, partially eroded, dome-shaped feature along the margins of a collapsed caldera. 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. Vein systems vary in true width from five to over 100 feet.

b. Soils

Generally, interbedded alluvial fan deposits of sand, sandy gravel, silty sand, and clayey sand underlie the processing and ancillary facilities. The Phase 1 heap leach pad will be constructed on the north flank of Soledad Mountain. 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 small stones to 50 percent stones and cobbles with depth. It varies in thickness from less than one inch to 24 inches in the area of the toe of the pad. The depth to bedrock ranges from 100 feet in the upslope area of the pad to approximately 260 feet in the toe area of the pad.

The future Phase 2 heap leach pad will be located on the west flank of Soledad Mountain in an area of Quaternary alluvium overlain by Cajon soil and Arizo soil. The Cajon soil is a light brown to brown, gravelly loam to loamy sand with 15 percent gravel. Cajon soil is located on alluvial fans and plains with zero to four percent slopes to the west and south of Soledad Mountain. The depth to bedrock in the vicinity of the future Phase 2 pad is unknown.

The waste rock will be used initially as construction material, to build a pad for the aggregate operation, stockpiled for the production and sale as construction materials and aggregate and backfilled in mined-out phases of the open pit. The volcanic bedrock on the flanks of Soledad Mountain has weathered to a soil referred to as torriorthents. The torriorthents consist of clay loam to cobbly, loamy sand with up to 60 to 70 percent rocks and cobbles. In many places, the torriorthents form steep scree and talus slopes.

c. Seismicity

The Facility is located in the seismically active Southern California region. Records from the late 19th Century to November 2006 show that at least 580 earthquakes of magnitude greater than or equal to 4.0 have been recorded within 62 miles of the Facility. The number of recorded earthquakes and their magnitudes indicates that the Facility is located in an area where future earthquakes can be expected. However, there are no known landslides or fault scarps on Soledad Mountain that could have been triggered or caused by earthquakes. Furthermore, stability analyses have been performed on the planned open pit slopes, the ore stacked on the heap leach pad to an ultimate height of 200 feet, and on the waste rock dumps to ensure stability under both static and seismic loading conditions.

25. Ore and Waste Rock Geochemistry

a. Acid Base Accounting

Acid generating and neutralization potential was evaluated using static testing procedures on ore, waste rock, historical tailings and leached and rinsed residues from column leach tests. The acid base accounting analyses demonstrate that the Acid Rock Drainage (ARD) potential of most waste materials is low to non-existent. The ARD Potential is defined as the ratio of acid neutralizing potential (NP) to acid generating potential (AP) or NP: AP = (NPR). Waste is potentially acid generating if the NPR <3. The testing results have indicated that of the 24 samples tested (comprised of drill cuttings, waste rock, and historical tailings), four samples were classified as likely acid generating (NPR<1), one was classified at a low acid generating potential (NPR <4 but >2), and one sample was classified as possibly capable of generating acid (NPR <2 but >1). The remaining samples (19) were all classified as non-acid generating, with an NPR >4.

The leached and rinsed residues, historical tailings, and the bulk of the waste rock contain insufficient sulphur for acid generation. Eleven representative samples of waste rock had a sulfide sulfur content ranging from < 0.01 to 0.04%; and <0.3% (the concentration of sulfide sulfur above which may indicate a concern for acid generating potential). The Discharger proposes to perform additional geochemical testing and ongoing monitoring of the ore and waste rock exposed during mining to further assess any potential for ARD at the Facility.

b. Metal Leaching

Tests were conducted on ore, waste rock, historical tailings and leached and rinsed residues from column leach tests to determine the potential for leaching metals. The tests followed the Waste Extraction Test (WET) procedure, and a citric acid solution was used as the lixiviant. In summary, the test results show that metal concentrations within the various materials (waste rock, ore, historical tailings and leached and rinsed residues) are below Soluble Threshold Limit Concentration (STLC) limits and that their leachability is very low and will not likely exceed water quality objectives.

26. Hydrology

a. Surface Water

There are no surface waters in the immediate vicinity of the Project.

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 project site. Numerous geologic studies prepared for the Facility have found no evidence (seasonal or otherwise) of shallow groundwater on Soledad Mountain.

b. Stormwater

Stormwater run-on will be routed through and/or around the various onsite facilities into up to five sediment ponds and will be regulated under the requirements contained in the General Construction and Industrial Activities Stormwater Permits as set out in Finding 15 (Stormwater Discharges) of this Order.

c. Groundwater

The Facility is located in the Fremont Valley groundwater basin. The primary aquifer in the area is the Quaternary alluvium, which fills the basins and wide expanses of the Mojave Desert between isolated bedrock outcrops. 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, a playa that represents the lowest point in the Fremont Valley basin with an elevation of 1,940 feet above MSL. The groundwater gradient is generally flat.

Groundwater recharge is primarily from the San Gabriel and Tehachapi mountains several miles to the southwest, west and northwest of Soledad Mountain. At the mountain front, alluvial fans (termed bajadas) receive runoff from the higher mountains and facilitate recharge. 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.

Water level data from characterization wells and production wells on site indicate that the groundwater gradient in the area is low (0.002) and water levels have typically decreased by approximately 3 feet in the last 10 years. Depth to groundwater in the area typically ranges from 200 to 250 feet. It is estimated that approximately 584 gallon per minute of groundwater is needed for Facility operations at the site.

Groundwater along the northern flank of Soledad Mountain has been analyzed regularly since installation of three characterization wells

(MW-1, MW-2 and MW-3) in September 1996. Two additional characterization wells, MW-4 and MW-5, were drilled and equipped in 2007. Groundwater has not been detected in MW-4 because of bedrock high in the area of the well. Attachment L of this Order shows a Piper diagram of the groundwater chemistries for the three initial wells. The water-quality types found in the wells are consistent with the types for the Fremont Valley Basin and the adjacent groundwater sub-basins of Fremont Valley surrounding the site. The groundwater chemistries for well MW-5, production, and domestic water wells are also consistent with water-quality types within the adjacent basins. MW-1 has elevated pH values ranging from 8 to 11 and higher sulfate, calcium, and potassium concentrations than those found in MW-2, MW-3, and MW-5, which is likely due to grouting of the bottom of the well. Groundwater chemistries at MW-2, MW-3, and MW-5 are similar, with pH values generally between 7.5 and 9. Arsenic concentrations in MW-2 and MW-3 are consistently above the Federal and State maximum contaminant level (MCL) in drinking water of 10 micrograms per liter (µg/L). Arsenic concentrations in MW-5 average 14 µg/L, which is only slightly greater than the MCL. Naturally occurring high background values for arsenic up to 300 µg/L have been documented in the region. Values of arsenic in MW-3 have been as high as 314 µg/L, but have steadily decreased to 77 µg/L recently. Fluoride concentrations in wells MW-2, MW-3, and MW-5 have been between 0.2 and 1.0 mg/L in the past several years, which are below the MCL of 2 mg/L.

27. Land Uses

Land use in the area is residential and commercial in Mojave and the surrounding community, and open desert land.

28. Basin Plan

The Water Board adopted a Water Quality Control Plan for the Lahontan Basin (Basin Plan), which became effective on March 31, 1995.

29. Receiving Waters

The receiving waters are the ground waters of the Fremont Valley Ground Water Basin, Department of Water Resources No. 6-44 and the surface waters of the Antelope Hydrologic Unit.

30. Beneficial Uses

The beneficial uses of ground waters of the Fremont Valley Ground Water Basin, as set forth and defined in the Basin Plan, are:

a. Municipal and domestic supply;
b. Agricultural;
c. Industrial Service Supply;
d. Freshwater Replenishment.

The beneficial uses of surface water of the Antelope Hydrologic Unit as set forth and defined in the Basin Plan, are:

a. Municipal and domestic supply;
b. Agricultural;
c. Groundwater Recharge;
d. Water Contact Recreation;
e. Non-contact Water Recreation;
f. Warm Freshwater Habitat;
g. Wildlife Habitat.

31. Monitoring Parameters and Constituents of Concern

The Monitoring Parameters and Constituents of Concern (COCs) are set out in the Monitoring and Reporting Program and consist of pH, conductivity, total dissolved solids, total cyanide, weak acid dissociable (WAD) cyanide, and arsenic.

32. Water Quality Data Evaluation

The Discharger proposed statistical and non-statistical procedures for evaluating detection monitoring data. The procedures are detailed in the Monitoring and Reporting Program.

33. Other Considerations and Requirements for Discharge

Pursuant to California Water Code section 13241, the requirements of this Order take into consideration:

a. Past, present, and probable future beneficial uses of water:
This Order identifies past, present and probable future beneficial uses of water as described in Finding No. 30. The discharge will not adversely affect present or probable future beneficial uses of water, including municipal and domestic water supply, agricultural supply, industrial, and freshwater replenishment.

b. Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto: Finding Nos. 24 and 26 describe the environmental characteristics and quality of water from this hydrographic unit.

c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area:

The requirements of this Order will not result in groundwater degradation.

d. Economic considerations:
This Order authorizes the Discharger to implement closure and post-closure maintenance actions at the Facility as proposed by the Discharger. The Order accepts the Discharger's proposed actions as meeting the best practicable control method for protecting groundwater quality from impacts from the Landfill.

e. The need for developing housing within the region:
The Discharger is not responsible for developing housing within the region. This Order provides WDRs for the Facility.

f. The need to develop and use recycled water:
There is currently no source of recycled water available to the Discharger.

34. California Environmental Quality Act

This project is subject to the provisions of the California Environmental Quality Act (CEQA). The County of Kern is the CEQA Lead Agency for this project under CEQA guidelines.

The County of Kern certified a joint Environmental Impact Report/Environmental Impact Statement on September 8, 1997 for the Facility in accordance with section 15080 of the CEQA guidelines. A Supplemental Environmental Impact Report (SEIR) was prepared to due to modifications needed in conditional use permits and to comply with the 2002 State of California's new backfilling requirements for certain types of open pit metal mines.

The Water Board, acting as a CEQA Responsible Agency in compliance with California Code of Regulations, title 14, section 15096, subdivision (g)(2), evaluated the SEIR potentially significant impacts to water quality

and found no impacts. The SIER was adopted by the Kern County Board of Supervisors on April 8, 2010, following public review and comment.

35. Notification of Interested Parties

The Water Board has notified the Discharger and all known interested agencies and persons of its intent to adopt new WDRs for the project.

36. Consideration of Interested Parties

The Water Board, in a public meeting on July 14, 2010, heard and considered all comments pertaining to the discharge of waste.

IT IS HEREBY ORDERED that the Discharger shall comply with the following:

I. Board Order No. 6-98-009 is hereby rescinded.

II. DISCHARGE SPECIFICATIONS

A. Nondegradation

State Water Board Resolution No. 68-16 "Statement of Policy With Respect to Maintaining High Quality of Waters In California," known as the Nondegradation Policy, requires maintenance of existing high quality in surface waters, ground waters, or wetlands. Whenever the existing quality of water is better than the quality of water established in the Basin Plan, such existing quality shall be maintained unless appropriate findings are made under Resolution No. 68-16. The project as proposed will not purposefully discharge any waste that will degrade water quality.

B. Surface Water and Groundwater Objectives

Receiving water limitations are narrative and numerical water quality objectives contained in the Water Quality Control Plan for the Lahontan Basin (Basin Plan) for all surface waters and groundwaters of the Lahontan Region. As such, they are required to be met.

Surface Water Discharge Specifications

The discharge of waste to surface waters shall not cause, or contribute to, a violation of the following water quality objectives for waters of the Antelope Hydrologic Unit.

1. Ammonia

   Ammonia concentrations shall not exceed the values listed in Tables 3-1 to 3-4 of the Basin Plan for the corresponding conditions in these tables. Tables 3-1 to 3-4 of the Basin Plan are incorporated into these requirements by reference.

2. Bacteria, Coliform

   i. Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.

   ii. The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 milliliter (ml), nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. The log mean shall 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 or one sample exceeding 40/100 ml, for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.

3. Biostimulatory Substances

   Waters shall 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

   i. Waters designated as MUN (a beneficial use of surface water of the Antelope Hydrologic Unit) shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary MCL based upon drinking water standards specified in provisions of the California Code of Regulations, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

   ii. Waters shall 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 shall not exceed either a median value of 0.002 milligrams per liter (mg/L) or a maximum value of 0.003 mg/L. Median values shall be based on daily measurements taken within any six-month period.

6. Color

   Waters shall 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 shall not be depressed by more than 10 percent, nor shall the minimum dissolved oxygen concentration be less than 80 percent of saturation.

8. Floating Materials

   i. Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses.

   ii. The concentrations of floating material shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

9. Oil and Grease

   i. Waters shall 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.

   ii. The concentration of oils, greases, or other film or coat generating substances shall not be altered.

10. Pesticides

    i. For the purposes of these requirements, pesticides are defined to include insecticides, herbicides, rodenticides, fungicides, pesticides and all other economic poisons. An economic poison is any substance intended to prevent, repel, destroy, or mitigate the damage from insects, rodents, predatory animals, bacteria, fungi, or

weeds capable of infesting or harming vegetation, humans, or animals (California Agriculture Code 12753).

ii. Pesticide concentrations, individually or collectively, shall not exceed the lowest detectable levels, using the most recent detection procedures available. There shall not be an increase in pesticide concentrations found in bottom sediments. There shall be no detectable increase in bioaccumulation of pesticides in aquatic life.

iii. Waters designated as MUN shall not contain concentrations of pesticides or herbicides in excess of the limiting concentrations set forth in the California Code of Regulations, Title 22, Division 4, Chapter 15. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

11. pH

i. In fresh waters with designated beneficial use of WARM, changes in normal ambient pH levels shall not exceed 0.5 pH units. For all other waster in the Region, the pH must not be depressed below 6.5 or raised above 8.5.

ii. The Water Board recognizes that some waters of the Region may have natural pH levels outside of the 6.5 to 8.5 range. Compliance with the pH objective for these waters will be determined on a case-by-case basis.

12. Radioactivity

i. Radionuclides shall 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.

ii. Waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified by the more restrictive of the California Code of Regulations Title 22 Division 4, Article 5, sections 64441 et seq. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

13. Sediment

    The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

14. Settleable Materials

    Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. The concentration of settleable materials shall not be raised by more than 0.1 milliliter per liter.

15. Suspended Materials

    i. Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affect the water for beneficial uses.

    ii. The concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

16. Taste and Odors

    Waters shall 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. The taste and odor shall not be altered.

17. Temperature

    i. The natural receiving water temperature of all waters shall 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.

    ii. For waters designated WARM, water temperature shall not be altered by more than 5 degrees Fahrenheit above or below the natural temperature.

18. Toxicity

    i. All waters shall 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.

    ii. The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall 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 the most recent edition of *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association, et al.).

19. Turbidity

    Waters shall 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.

Groundwater Discharge Specifications

The discharge of waste to groundwaters shall not cause, or contribute to, a violation of the following water quality objectives for waters of the Fremont Valley Groundwater Basin.

1. Coliform Bacteria

   In groundwaters designated as MUN, the median concentration of coliform organisms over any seven-day period must be less than 1.1/100 milliliters.

2. Chemical Constituents

   i. Groundwaters designated as MUN must not contain concentrations of chemical constituent in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the provisions of Title 22, Division 4, Chapter 15 of the California Code of Regulations.

   ii. Waters designated as AGR must not contain concentration of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes).

iii. Groundwaters must no contain concentrations of chemical constituents that adversely affect the water for beneficial uses.

3. Radioactivity

Groundwaters designated as MUN must not contain concentrations of radionuclides in excess of limits specified by the more restrictive of the California Code of Regulations, Title 22, Division 4, Article 5 (Cal. Code Regs., tit. 22, § 64441 et seq.).

4. Taste and Odor

Groundwaters must not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses. For groundwaters designated as MUN, at a minimum, concentrations must not exceed adopted secondary maximum contaminant levels specified in Title 22, Division 4, Chapter 15 of the California Code of Regulations.

C. Authorized Disposal Sites

The discharge of process solution or any material containing cyanide except to the Authorized Disposal Sites is prohibited. The Authorized Disposal Sites are set out in Finding 17 of this Order.

D. Design and Construction

1. The heap leach pads (as specified in Findings 10a, 11a, and the March 2007 ROWD) shall be in compliance with the requirements contained in Chapter 7, Title 27, California Code of Regulations for a Group B Mining Waste Pile.

2. The surface impoundments (as specified in Finding 10b and the March 2007 ROWD) shall be in compliance with the requirements contained in Chapter 7, Title 27, California Code of Regulations for a Group B Mining Waste Surface Impoundment. The surface impoundments shall be constructed for the capacity of a 1,000-year, 24-hour design storm and constructed to protect from a 100-year peak stream flow.

3. The waste rock disposal sites (as specified in Finding 10c and the March 2007 ROWD) shall comply with the requirements contained in Chapter 7, Title 27, California Code of Regulations for a Group C Mining Waste Pile.

4. The Discharger shall follow ASTM (American Society of Testing and Materials) standards, or their equivalent, for liner construction and quality control tests ("ASTM Standards and Other Specifications and Test Methods on the Quality Assurance of Landfill Liner Systems," 1994,

ASTM, 1916 Race St., Philadelphia, PA), to verify liner integrity prior to use. The Water Board may arrange to conduct additional independent testing to verify liner integrity.

5. All facilities used in the extraction process and for disposal of waste shall be adequately protected against washout, inundation, structural damage, or a significant reduction in efficiency resulting from a 100-year, 24-hour storm event.

6. The Discharger shall comply, at all times, with the engineering plans, specifications, and technical reports submitted with the complete Report of Waste Discharge.

III. GENERAL REQUIREMENTS AND PROHIBITIONS

A. General

1. The discharge of Hazardous Waste, as defined in section 20164, Title 27, California Code of Regulations for treatment, storage, or disposal, to the Authorized Disposal Sites or the generation of Hazardous Waste due to evaporation in the surface impoundments is prohibited.

2. The discharge of Hazardous Constituents, as defined in section 20164, Title 27, California Code of Regulations for treatment, storage, or disposal, to the Authorized Disposal Sites that cause the waste to be identified as a hazardous waste is prohibited.

3. The discharge of wastes that fall under the restrictions of section 66268.1 et seq. of Title 22, California Code of Regulations for treatment, storage, or disposal, to the Authorized Disposal Sites is prohibited.

4. The discharge of any type of nonhazardous waste to the Authorized Disposal Sites, including garbage, paper, wood, scrap metal, abandoned equipment, and construction materials without prior approval by the Water Board is prohibited.

5. The Discharger shall not cause a release from the Authorized Disposal Sites, as indicated by the appropriate statistical or non-statistical data analysis and verification procedures of the Monitoring and Reporting Program. A release is defined as waste materials detected outside the waste management unit.

6. If a release is detected that exceeds the trigger values of the concentration limits of the Monitoring and Reporting Program, the

continued use of all or part of an Authorized Disposal Site may be prohibited by the Water Board, until such time as the release is corrected and there is no longer a threat to water quality caused by the release.

7. The Discharger shall be prepared to correct any release from an Authorized Disposal Site, including, but not limited to, shutting off all or part of any related processing facilities; rinsing and neutralizing the affected area; removing partially leached ore and any soil affected; repairing and/or replacing all or part of a leaking liner; and any other corrective measures required to mitigate a potential threat to water quality caused by the release.

8. All chemical and petroleum product storage tanks on site will be constructed with secondary containment structures and/or features.

9. All cyanide-contaminated industrial containers shall either by rinsed as required by Department of Transportation regulations and returned to the vendor, or rinsed and rendered unusable before disposal.

10. All hazardous material containers shall be properly secured in a storage facility that is not susceptible to the elements or accessible to the public.

11. Any ore brought in from offsite for processing must be of similar composition as ore mined at the Facility. Information regarding offsite ore shall be submitted to the Water Board for review before processing.

12. The Discharger shall use methods approved by the Department of Fish and Game to prevent wildlife exposure to any substances that may prove to be deleterious to wildlife. The Discharger shall grant access to Department of Fish and Game personnel to inspect the Facility for compliance with this general requirement.

B. Stormwater Discharges

Waste in discharges of storm water must be reduced or prevented to achieve the best practicable treatment level using controls, structures, and management practices. The Applicant shall comply with all requirements (with the exception of purely administrative requirements, e.g., filing a Notice of Intent) contained in State Water Board's *Waste Discharge Requirements For Discharges of Storm Water Discharges Associated With Construction Activity, General Permit No. CAS00002* and *Waste Discharge Requirements For Discharges of Storm Water Associated With Industrial Activities, General Permit No. CAS00001* and all subsequent revisions and amendments.

These requirements do not preclude the Applicant from requirements imposed by municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to separate storm sewer systems or other water, conveyances and water bodies under their jurisdiction.

C. Detection Monitoring Program

The Discharger shall maintain a Detection Monitoring Program pursuant to section 20385(a) (1), Title 27, California Code of Regulations.

D. Evaluation Monitoring Program

The Discharger shall establish an Evaluation Monitoring Program whenever there is evidence of a release from any portion of the Facility, including Authorized Disposal Sites, pursuant to section 20420(k)(5) and 20425, Title 27, California Code of Regulations.

E. Corrective Action Program

The Discharger shall institute a Corrective Action Program when required pursuant to section 20385(a) (4), Title 27, California Code of Regulations.

IV. PROVISIONS

A. Standard Provisions

The Discharger shall comply with the "Standard Provisions for Waste Discharge Requirements," dated September 1, 1994, as set out in Attachment M, which is made part of this Order.

B. Monitoring and Reporting

1. Pursuant to section 13267 of the California Water Code, the Discharger shall comply with and implement the Monitoring and Reporting Program.

2. Pursuant to the Monitoring and Reporting Program, the Discharger shall maintain a Quality Assurance/Quality Control Plan (QA/QC Plan) for sampling and analysis.

3. Pursuant to section 20405, Title 27, California Code of Regulations, the Point of Compliance (POC) for each WMU shall consist of each compliance monitoring point, including the LDCS and vadose zone monitoring points for each WMU. Constituents of Concern (COCs) shall

not exceed their respective concentration limits at each compliance monitoring point.

4. Compliance Period

   a. Release

      Each time the concentration limits are exceeded (i.e., a release above the concentration limit is discovered), a Compliance Period for the affected WMU shall begin on the date the Water Board directs the Discharger to begin an Evaluation Monitoring Program.

   b. Automatic Extension

      The Discharger shall implement its Corrective Action Program in a timely manner. Pursuant to section 20410, Title 27, California Code of Regulations, if the Discharger's Corrective Action Program has not achieved compliance by the scheduled end of the Compliance Period, the Compliance Period shall be automatically extended until the affected WMU has been in continuous compliance for a least three consecutive years.

C. Closure and Post-Closure Maintenance Plan (Closure Plan)

1. Each WMU at the Facility must be closed pursuant to a Final Closure Plan prepared in accordance with all applicable requirements of Title 27 and Title 14, California Code of Regulations and submitted to and approved by the Water Board.

   a. Preliminary Closure Plan

      The Preliminary Closure Plan submitted with the Report of Waste Discharge (section 21710, Title 27, California Code of Regulations) shall be updated/modified by the Discharger if there is a substantial change in operations, or if requested by the Water Board. Each Annual Report shall confirm that the Closure Plan conforms to the existing operations at that time.

   b. Final Closure Plan

      The Final Closure Plan shall be submitted at least 180 days prior to beginning any partial or final closure activities. The Final Closure Plan shall be prepared by or under the supervision of either a California Registered Civil Engineer or a Certified Engineering Geologist.

2. The Discharger shall provide and maintain adequate financial assurance for closure and post-closure maintenance per Finding 21 of this Order.

D. Neutralization and Closure of WMUs

1. Neutralization, closure, and post-closure maintenance of the WMUs at the Facility shall be in compliance with section 22510, Title 27, California Code of Regulations.

2. The waste piles and surface impoundments shall be neutralized as soon as practicable but in no case shall neutralization commence later than 12 months after completion of active leaching. Active leaching is considered "completed" if application of process solution to ore has been discontinued for a period of 180 days.

3. For neutralization to be considered complete, the residual cyanide concentration in any solid waste (i.e., leached residues on the heap leach pads), liquid waste (i.e., process solutions), or any solid or liquid fraction of any waste, in any WMU, shall not exceed the concentration limits set by the Water Board and listed below.

CONCENTRATION LIMITS FOR RESIDUAL PROCESS SOLUTIONS	
Constituent	**Concentration**
Total Cyanide	1.0 mg/L
WAD Cyanide	0.2 mg/L
pH	6.0 to 8.5
Soluble Total Cyanide	2.5 mg/kg
Soluble WAD Cyanide	0.5 mg/kg
Total Cyanide[1]	10.0 mg/kg

[1] After extraction of soluble WAD and soluble total cyanide

E. Financial Assurance

1. Before waste is discharged, the Discharger shall provide and maintain financial assurance in an amount and form acceptable to the Water Board staff to ensure that funds are available for closure and post-closure maintenance as required in section 22510(f), Title 27, California Code of Regulations, for all constituents of concern, for all classified wastes, and

for all WMUs, including reclamation of the leached and rinsed residues and other material resulting from the mining operation if the sale of these materials does not occur.

2. Before waste is discharged, the Discharger shall provide and maintain financial assurance in an amount and form acceptable to the Water Board staff to ensure that funds are available to complete corrective action for a reasonably foreseeable release, as required in section 20380, Title 27, California Code of Regulations, for all constituents of concern, for all classified wastes, and for all WMUs.

3. The Discharger shall submit evidence annually that adequate financial assurance pursuant to the requirements of this Order has been obtained or continued. Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument. The Discharger shall adjust the amount of financial assurance as required to reflect changes in operation, regulatory requirements, the Closure Plan, or other unforeseen events.

F. Other Provisions

1. Signs must be posted in English and Spanish to warn the public of the use of cyanide.

2. The Discharger shall have in place adequate emergency response plans in order to clean up any spill or release of any waste at the Facility.

3. The discharger must ensure that storm water discharges and non-storm water discharges do not cause or contribute to an exceedance of any applicable water quality standards.

V. TIME SCHEDULE

A. Closure and Post Closure Maintenance Plan (Closure Plan)

The Preliminary Closure Plan and cost estimates shall be updated and submitted to the Water Board annually, beginning on **November 15, 2011**. The Preliminary Closure Plan shall include an itemized and lump sum Estimate of the costs of carrying out all actions necessary to close the Facility, to prepare detailed design specifications, to develop the Final Closure Plan, until reclamation activities are deemed completed pursuant to applicable section 20950, Title 27, California Code of Regulations.

B. Reasonably Foreseeable Release Plan

1. A Reasonably Foreseeable Release Plan shall be submitted to the Water Board by **November 15, 2011**, and shall include the information required by section 20420 through 20430, Title 27, California Code of Regulations.

2. An itemized and lump sum Estimate of the costs of carrying out all actions necessary as set out in the Reasonably Foreseeable Release Plan, pursuant to applicable State Water Board promulgated requirements of section 22207, Title 27, California Code of Regulations shall be submitted to the Water Board by **November 15, 2011**.

3. The Reasonably Foreseeable Release Plan and Lump Sum Estimate shall be updated and submitted to the Water Board annually, beginning on **November 15, 2012**.

C. Financial Assurance

1. A separate Financial Assurance Instrument(s) providing adequate funding, secured by other than corporate guarantees, for the Preliminary Closure and Post-Closure Maintenance Lump Sum Estimate in V.A. of this Order shall be submitted to the Water Board, pursuant to section 22207, Title 27, California Code of Regulations by **November 15, 2011**.

2. A separate Financial Assurance Instrument(s) providing adequate funding for the Reasonably Foreseeable Release Lump Sum Estimate in V.B.2. of this Order shall be submitted to the Water Board, pursuant to section 22212 Title 27, California Code of Regulations by **November 15, 2011**.

3. Lump Sum Estimates shall be revised annually and submitted to the Water Board for approval as set out in V.A. and V.B. of this Order. Each Financial Assurance Instrument(s) shall be updated accordingly and submitted to the Water Board annually, beginning on **November 15, 2012**.

I, Harold J. Singer, 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 July 14, 2010.

Harold J. Singer

HAROLD J. SINGER
EXECUTIVE OFFICER

Attachments: A. Property Map
B. Site Plan

C. Project Location Map
D. Open Pit Design
E. Pump Box (Design)
F. Overflow Pond (Design)
G. Solution Collection Piping Layout
H. Phase I Heap Leach Pad Layout
I. Leak Detection and Collection System (LDCS) Design
J. Monitoring Locations
K. Lysimeter Detail
L. Piper Diagram of Soledad Mountain Groundwater (Chemistry)
M. Standard Provisions for Waste Discharge Requirements

Monitoring and Reporting Program No. R6V-2010-0031

MRP-1 Location of Monitoring Points
MRP-2 Well Locations
MRP-3 General Provisions for Monitoring and Reporting