

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2014-0138

EQUINOX RESOURCES (CALIFORNIA) INC.
AND
THE UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ZENDA MINE

KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereinafter Central Valley Water Board) finds that:

1. Equinox Resources (California) Inc. (hereinafter Equinox) and the United States Department of the Interior, Bureau of Land Management (hereinafter jointly referred to as Discharger) each own a portion of the property on which the Zenda Mine is located. The mine is about two miles southwest of the town of Loraine and 12 miles north of the City of Tehachapi, in Sections 29 and 30, Township 30 South, Range 33 East, Mount Diablo Baseline and Meridian, as shown in Attachment A, which is incorporated herein and made part of this Order by reference. The facility is comprised of Assessor's Parcel Numbers 179-410-17, -18, and -19.
2. Equinox proposes to mine and process low-grade gold and silver ore on the mine property. Approximately 800,000 tons of ore and 1,000,000 tons of overburden and waste rock would be removed by open pit mining. The ore would be processed using a cyanide heap-leaching method.
3. The United States Government, through the agency of the Department of the Interior, Bureau of Land Management (BLM), is the owner of a portion of the real property at which the discharge will occur. The BLM is responsible for ensuring compliance with these requirements on land over which they administer, but Equinox is responsible for day-to-day operations and monitoring. Enforcement actions will be taken against the BLM (landowners) only in the event that enforcement actions against Equinox are ineffective or futile, or that enforcement is necessary to protect public health and the environment. In addition, since the BLM is a public agency, enforcement actions will be taken against them only after they are given the opportunity to use their governmental powers to remedy the waste discharge.
4. The proposed mine would be located on 870 acres about 0.75 miles south of Caliente Creek Road, approximately 9.5 miles east of its intersection with Caliente Bodfish Road. The waste management units (WMUs) will cover approximately 40 acres and consist of one heap leach pad (WMU No. 1), supported by an embankment

constructed of nonreactive waste rock and overburden material, and one surface impoundment (WMU No. 2) known as a “pregnant pond” as shown in Attachment B, which is incorporated herein and made part of this Order by reference.

5. Mining operations, construction of the mining waste management units, and initiation of heap leach extraction process have not commenced.
6. On 23 February 1989, the Discharger submitted a Report of Waste Discharge (ROWD). The information in the ROWD has been used in updating these waste discharge requirements (WDRs). The ROWD contains the applicable information required in California Code of Regulations, title 27, section 20005 et seq. (Title 27).
7. The mining facility is currently regulated by Order No. 97-168, adopted by the Central Valley Water Board on 8 August 1997. Order No. 97-168 no longer reflects the plans and policies of the Central Valley Water Board.
8. This Order implements the applicable regulations for discharges of mining waste to land through Prohibitions, Specifications, Provisions, and monitoring and reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the Standard Provisions and Reporting Requirements for Industrial Facilities Regulated by Title 27, dated November 2013 (SPRRs) which are attached hereto and made part of this Order. Monitoring and reporting requirements are included in Monitoring and Reporting Program No. R5-2014-0138 (MRP) and in the SPRRs. In general, requirements that are either in regulation or otherwise apply to all facilities regulated under Title 27 are considered to be “standard” and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in the applicable section (A through H) of these WDRs, and the requirement in the WDRs supersedes the requirement in the SPRRs.

WASTE CLASSIFICATION AND UNIT CLASSIFICATION

9. Title 27, section 22480 classifies mining wastes in three Groups; A, B, and C as follows:

“Group A wastes must be managed as hazardous waste pursuant to Chapter 11 of Division 4.5, of Title 22, California Code of Regulations (Title 22), provided Regional Water Board staff finds that such mining wastes pose a significant threat to water quality. Group B mining wastes are either: wastes that consist of or contain hazardous wastes that qualify for a variance under Title 22, provided Regional Water Board staff finds that such mining wastes pose a low threat to water quality; or mining wastes that consist of or contain non-hazardous soluble pollutants of concentrations that exceed water quality objectives (WQOs) for, or could cause, degradation of waters of the state. Group C wastes are wastes from which any discharge would be in compliance with the applicable water quality control plan, including WQOs other than turbidity.”

10. Analysis of overburden samples and waste rock samples indicate a minimum net neutralizing potential of eight times the acid generating potential. Overburden and waste rock samples were also analyzed for heavy metals utilizing the waste extraction procedure (California Code of Regulations, title 22, section 66261.24, appendix II). Based on the analytical results, the overburden and the waste rock are tentatively classified as Group C mining wastes in accordance with of Title 27, section 22480. As such, they do not require containment.
11. The Discharger proposes to use a sodium cyanide (NaCN) solution to leach silver and gold from the ore. The Department of Toxic Substances Control has established guidelines that specify the concentrations of free cyanide that make a waste hazardous under California Code of Regulations, title 22. Free cyanide includes two species: ionic cyanide (CN⁻) and hydrogen cyanide (HCN). The concentrations at which free cyanide becomes hazardous are 460 milligrams per liter (mg/l) for CN⁻ and 206 mg/l for HCN. At a pH greater than 10.5, CN⁻ is the predominate species.
12. During active mining, the proposed concentration of free cyanide as CN⁻ in the leaching solution will average 300 mg/l and range up to 400 mg/l, which poses a significant threat to water quality, but is not hazardous provided the pH is maintained below 12.5. The Discharger proposes to maintain the leaching solution at a pH of 10.5 to maintain 95% of the free cyanide in the form of CN⁻ and assure a nonhazardous solution.
13. The concentrations of cyanide used in the heap leach process or discharged to the pregnant pond will not exceed hazardous levels. However, these concentrations will exceed the criteria to protect human health and aquatic life. Therefore, these wastes must be managed as Group B mining wastes in accordance with Title 27.
14. This Order classifies WMU No. 1 as a Group B mining waste pile and WMU No. 2 as a Group B mining waste impoundment, in accordance with Title 27.
15. As a precautionary measure, the Discharger proposes to construct WMU No. 1 and WMU No. 2 to the performance standards for Group A wastes.
16. The facility is expected to operate for three to five years. In addition to WMU No. 1 and WMU No. 2, mining facilities will consist of an open pit mine, a temporary ore stockpile, a crushing plant, and a recovery plant.
17. Ore will be crushed to about one-inch size, agglomerated with lime and cement, and placed into WMU No. 1. Precious metals will be leached from the heap with the high-pH sodium cyanide solution applied through a drip irrigation system.
18. Gold-bearing or "pregnant" solution will be collected at the bottom of WMU No. 1 and routed to WMU No. 2 to allow settlement of fine-grained particulate matter prior to gold and silver removal by carbon columns.

19. The Discharger will place and leach ore in the heap leach unit in nominal 20-foot lifts with an initial lift thickness of 40 feet. The ore heap will have a maximum height of 170 feet.
20. The leaching solution concentration will be maintained at approximately 0.98 pounds of sodium cyanide per ton of leaching solution. Sodium cyanide and lime will be stored on a concrete pad that will be adjacent to and sloped to drain to the heap leach unit.

SITE DESCRIPTION

21. The facility is located in central Kern County in the Loraine Mining District. The topography consists of moderately steep granitic slopes vegetated by scrub oak and pines. There are six springs within one mile of the facility and Caliente Creek is located approximately one mile to the north.
22. Land uses within one mile of the facility include stock grazing.
23. There is one water supply well and four groundwater monitoring wells within the proposed facility boundary. Otherwise, there are no municipal, domestic, industrial, or agricultural groundwater supply wells within one mile of the facility.
24. The facility is located within the Tehachapi structural block. The facility is underlain by granodiorite of the Sierra Nevada Batholith that has been intruded by rhyolitic dikes and sills. Residual soils that have formed on the granodiorite are up to 24 inches thick.
25. Based on a site-specific seismic analysis, the controlling maximum credible earthquake (MCE) for the site is a Richter magnitude 8 event along the White Wolf Fault at a closest rupture distance of seven miles from the site. It is estimated that a MCE event would produce a peak ground acceleration of 0.50g at the site.
26. The facility receives an average of 16 inches of precipitation per year as measured at the Tehachapi Station. The mean pan evaporation is 92 inches per year as measured at the Verdugo Pump Station, located eight miles southeast of the mine.
27. The 1,000-year, 24-hour precipitation event for the facility is estimated to be 8.4 inches, based information from the *National Oceanic and Atmospheric Administration Atlas 14, Volume 6, Version 2*.
28. The mining facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Numbers 06029C2411E and 06029C2412E.

SURFACE WATER AND GROUNDWATER CONDITIONS

29. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition* (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
30. Surface water drainage from the site is to Caliente Creek in the Tehachapi Creek Hydrologic Area (556.10) of the Grapevine Hydrologic Unit, which is part of the Westside Streams as designated by the Basin Plan.
31. The designated beneficial uses of Westside Streams, as specified in the Basin Plan, are agricultural supply; industrial service supply; industrial process supply; water contact recreation; non-contact water recreation; warm fresh water habitat; wildlife habitat; rare and endangered species; and groundwater recharge.
32. The first encountered groundwater ranges from about 10 feet to 300 feet below the native ground surface.
33. Monitoring data indicate background groundwater quality for first encountered groundwater has electrical conductivity (EC) ranging between 700 and 1,000 micromhos per centimeter.
34. The direction of groundwater flow is generally toward the northwest. Groundwater flow generally follows the topography. The groundwater elevation is over 490 feet above the flow line elevation of Caliente Creek at the closest point to the facility.
35. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal water supply, agricultural supply, industrial service supply, and industrial process supply.

GROUNDWATER, UNSATURATED ZONE, AND SURFACE WATER MONITORING

36. Four groundwater monitoring wells (MW-1, MW-2, MW-3, and MW-4) and the water supply well (W-1) have been installed at the facility, as shown on Attachment B. Monitoring wells MW-3 and MW-4 did not encounter water when they were constructed, but they have been left in place in the event that the groundwater elevation changes.
37. The Discharger's detection monitoring program for groundwater at the facility does not satisfy the requirements contained in Title 27. This Order requires the Discharger to construct a groundwater monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420 prior to discharging leaching solution.

38. The Discharger has proposed an unsaturated zone monitoring system to be constructed beneath the heap leach unit that will be comprised of radiating French drains beneath the secondary liner.
39. The surface water monitoring system consists of six spring sampling points and two sampling points on Caliente Creek. The sampling points are listed in the following table:

Mon Pt.	Description
SL-1	Natural spring at toe of embankment
SL-2	Natural spring 1,000 ft. SE of mining pit
SL-3	Natural spring 1,700 ft. SW of mining pit
SL-4	Natural spring 2,600 ft. SW of mining pit
SL-5	Natural spring 2,300 ft. NW of the heap leach unit
SL-6	Caliente Creek 500 ft. upstream of Big Last Chance Canyon confluence
SL-7	Caliente Creek 500 ft. downstream of Big Last Chance Canyon confluence
SL-8	Natural spring 2,500 ft. west of the heap leach unit

40. Though the Discharger has not submitted a Water Quality Protection Standard (WQPS) report, this Order prohibits the Discharger from discharging leaching solution until such a report is submitted and approved by the Executive Officer.

DESIGN OF WASTE MANAGEMENT UNIT(S)

41. Title 27, section 22470 et seq. sets prescriptive standards for the construction of mine waste management units. The standards for a Group A waste pile include a liner constructed of clay compacted to a maximum hydraulic conductivity of 10^{-6} centimeters per second (cm/s) and a leachate collection and removal system (LCRS). The standards for a Group A surface impoundment include a double liner each constructed of clay compacted to a maximum hydraulic conductivity of 10^{-7} cm/s with an LCRS constructed between them.
42. Title 27, section 20080(b) allows the Central Valley Water Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with Title 27, section 20080(c)(1) or (2), the Discharger must demonstrate that the prescriptive design is unreasonably and

unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in section 20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative(s) provides protection against water quality impairment equivalent to the prescriptive standard in accordance with Title 27, section 20080(b)(2) and that any proposed engineered alternative is consistent with the performance goal in accordance with Title 27 sections 20240, 20250, and 20310.

43. The Discharger proposes a liner system which will be designed, constructed, and operated to prevent migration of wastes from the mining waste units to adjacent natural geologic materials, groundwater, or surface water during mining and ore-processing operations, closure, and the post-closure maintenance period in accordance with the criteria set forth in Title 27 for mining waste management units.
44. The Discharger adequately demonstrated that construction of the liner prescriptive standard for the waste management units as described in Title 27 would be unreasonable and unnecessarily burdensome when compared to the proposed engineered alternative design because there is no clay source on-site or nearby and the cost of importing clay from off-site or mixing on-site soils with bentonite would cost substantially more than the alternative design. The Discharger has demonstrated that the proposed engineered alternative is consistent with the performance goals of the containment structures for Group A mining wastes, and, therefore, exceeds requirements for containment of the Group B wastes that would be discharged to the units.
45. The Discharger proposes a liner system for WMU No.1 consisting of, from top to bottom:
 - a. A high-density polyethylene geonet LCRS to collect pregnant cyanide solution;
 - b. A 40-mil polyvinyl chloride geomembrane;
 - c. A high-density polyethylene geonet secondary LCRS;
 - d. A secondary 40-mil polyvinyl chloride geomembrane; and
 - e. A six- to twelve-inch thick engineered subgrade.
46. The Discharger proposes a liner system for WMU No. 2 consisting of, from top to bottom:
 - a. A 40-mil polyvinyl chloride geomembrane;
 - b. A high-density polyethylene geonet LCRS;

- c. A secondary 40-mil polyvinyl chloride geomembrane; and
 - d. A six- to twelve-inch thick engineered subgrade.
47. The ROWD contains a stability analysis for the facility. The static stability analysis indicates a factor of safety of 1.68 and a dynamic (seismic) stability factor of safety of 1.1.
48. Title 27, section 22490(h) requires mining surface impoundments to have capacity for seasonal precipitation, a 25-year 24-hour design storm event, and to maintain at least two feet of freeboard at all times. The 25-year, 24-hour storm event for the site is 4 inches, and is referred to hereafter as the “design storm”.
49. This Order requires WMU No. 2 to have capacity for leaching solution flows to the impoundment, precipitation and contaminated site runoff from the design storm, and still maintain at least two (2.0) feet of freeboard at all times.
50. This Order requires the Discharger to propose an Action Leakage Rate (ALR) for the WMU No. 1 secondary LCRS and for the WMU No. 2 LCRS. The ALR is the maximum flow rate through the primary liner to the LCRS beyond which the Discharger is required to take actions to inspect and repair the primary liner system.
51. Construction will proceed only after all applicable construction quality assurance plans have been approved by the Executive Officer.

CLEAN CLOSURE AND CLOSURE FINANCIAL ASSURANCES

52. A Preliminary Closure Plan (PCP) for the mining units is included in the ROWD. Pursuant to Title 27, section 21400(b)(1), the PCP proposes clean-closure of WMU No. 2 and closure of WMU No. 1 as a landfill. The PCP proposes to prepare, and this Order requires, that a final closure plan be submitted and approved prior to commencing closure activities.
53. Pursuant to Title 27, section 22510, this Order requires the Discharger to establish financial assurances for closure of the mining units in accordance with an approved updated cost estimate naming the Central Valley Water Board as the beneficiary.

FINANCIAL ASSURANCES FOR CORRECTIVE ACTION

54. Title 27, section 22222 requires the Discharger to establish financial assurances for corrective action of a known or reasonably foreseeable release. This Order requires the Discharger to establish financial assurances for corrective action in accordance with an approved cost estimate naming the Central Valley Water Board as the beneficiary. This Order also requires annual adjustments to account for inflation by 1 June of each year.

CEQA AND OTHER CONSIDERATIONS

55. To fulfill requirements imposed by the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.), the Kern County Planning Department circulated an Initial Study and Mitigated Negative Declaration (MND) (SCH # 89040318) for the permitting and operation of the mine. The Central Valley Water Board was consulted as a responsible agency and did not identify any significant environmental effects that could result from the project. On 3 July 1989, the Kern County Planning Department approved the MND after the conclusion of the public comment period.
56. As a responsible agency, the Central Valley Water Board has responsibility for mitigating or avoiding only the direct or indirect environmental effects of those parts of the project that fall under its authority. The MND contains mitigation measures that the Discharger agreed to implement. The mitigation measures do not pertain to water quality.
57. This order implements:
- a. *Water Quality Control Plan for the Tulare Lake Basin, Second Edition.*
 - b. The prescriptive standards and performance goals of Title 27, effective 18 July 1997, and subsequent revisions.
58. Based on the threat and complexity of the discharge at this time, the facility is determined to be classified 3-C as defined below:
- a. Category 3 threat to water quality, defined as, "Those discharges of waste that could degrade water quality without violating water quality objectives, or could cause a minor impairment of designated beneficial uses as compared with Category 1 and Category 2."
 - b. Category C complexity, defined as, "Any discharger for which waste discharge requirements have been prescribed pursuant to Section 13263 or the Water Code not included in Category A or Category B. Included are dischargers having no waste treatment systems or that must comply with best management practices, dischargers having passive treatment and disposal systems, or dischargers having waste storage systems with land disposal."
59. When mining operations commence, the threat and complexity of the discharge will be re-evaluated and possibly changed to a classification of 2-B, or higher. Classification 2-B is defined below:
- a. Category 2 threat to water quality, defined as, "Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-

term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.”

- b. Category B complexity, defined as, “Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units.”

60. Water Code 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.

61. The technical reports required by this Order and the attached "Monitoring and Reporting Program R5-2014-0138" are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

PROCEDURAL REQUIREMENTS

62. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
63. The Central Valley Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
64. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Water Code sections 13263 and 13267, that Order No. 97-168 is rescinded, except for the purposes of enforcement of violations occurring prior to the effective date of this Order, and that Equinox Resources (California), Inc. and the U.S. Department of the Interior, Bureau of Land Management, their agents, successors, and

assigns, in order to meet the provisions of Division 7 of the Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of 'hazardous waste' is prohibited. For the purposes of this Order, the term 'hazardous waste' is as defined in California Code of Regulations, title 22, section 66261.1 et seq.
2. The discharge of solid waste or liquid waste to surface waters, surface water drainage courses, or groundwater is prohibited.
3. The discharge of wastes outside of a waste management unit or portions of a waste management unit specifically designed for their containment is prohibited.
4. The discharge of waste from sources other than the mining operations described herein is prohibited.
5. The use of any leaching chemical other than cyanide is prohibited.
6. The Discharger shall comply with all Standard Prohibitions listed in Section C of the SPRRs.

B. DISCHARGE SPECIFICATIONS

1. Excavation, placement, treatment, and disposal of mining material shall not cause a condition of pollution or nuisance as defined by the Water Code section 13050.
2. Prior to the discharge of wastes, the Discharger shall implement the MRP.
3. Mining materials; including ore, spent ore, and leaching solution; shall be confined to the mining waste management units specifically designed and constructed for their containment, as identified in Findings of this Order and generally located as shown on Attachments A and B.
4. There shall be no wind transport of cyanide solution or ore containing cyanide out of the mining waste management units or chemical storage and handling areas.
5. Continued placement and/or disposal of overburden or unprocessed mined ore is contingent upon continued classification as a Group C mining waste, based on sampling and testing specified in the MRP.
6. The Discharger shall maintain the pH of the leaching solution in the pregnant pond and the heap leach unit equal to or between 10.4 and 12.4 at all times.

7. The Discharger shall comply with all Standard Discharge Specifications listed in Section D of the SPRRs.

C. FACILITY SPECIFICATIONS

1. Annually, prior to the anticipated rainy season but no later than **1 November**, any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed and reported in compliance with the MRP.
2. During construction, operation, closure, and post-closure maintenance:
 - a. Disturbed areas of roadway shall be water barred as necessary and drained with proper erosion control provisions on to undisturbed areas.
 - b. Vegetation shall not be removed and natural soil conditions shall not be disturbed except where pre-established or concurrent storm drainage and erosion control measures prevent discharge of sediment to surface waters.
3. The processing facilities, including chemical storage and handling areas, shall be sloped to drain to the pregnant pond or the heap leach unit.
4. Surface runoff from areas other than those described in C.3 above shall be directed away from the pregnant pond, the heap leach unit, and the processing facilities.
5. The Discharger shall test the LCRS of each mining waste unit at least annually to demonstrate proper function.
6. The depth of the fluid in any LCRS sump shall be kept at the minimum needed for safe pump operation without excessive pump cycling that could damage the pump.
7. Wildlife and unauthorized persons shall be excluded from the mining waste management units.

Waste Management Unit No. 1 - Heap Leach Pad

8. If leachate generation in the secondary LCRS of WMU No. 1 exceeds the action leakage rate, the Discharger shall:
 - a. **Immediately** notify Central Valley Water Board staff by telephone and email.
 - b. Submit written notification within **seven days** that includes a time schedule to locate and repair leak(s) in the liner system.

- c. If repairs do not result in a leakage rate less than the required action leakage rate, the Discharger shall submit written notification within **seven days** that includes a time schedule for replacement of the upper liner of the waste pile or other action necessary to reduce leachate production.
 - d. Complete repairs or liner replacement in accordance with the approved time schedule under “b” and/or “c”, above.
9. If leachate is detected in the unsaturated zone monitoring device of WMU No. 1, indicating a leak in the containment structures, the Discharger shall:
 - a. **Immediately** notify Central Valley Water Board staff by telephone and email that the containment structures have failed.
 - b. **Immediately** sample and test the liquid in accordance with the unsaturated zone monitoring requirements in the MRP.
 - c. Submit written notification of the release to Central Valley Water Board staff within **seven days** including a time schedule to repair the containment structures.
 - d. Complete repairs of the containment structures in accordance with the approved time schedule.
10. The Discharger shall comply with all Standard Facility Specifications listed in Section E of the SPRRs.

Waste Management Unit No. 2 - Pregnant Pond

11. WMU No. 2 shall be operated to maintain a minimum of two feet of freeboard at all times. Pond capacity shall be such that adequate volume is maintained to accommodate a 1,000-year 24-hour storm event (design storm) of 8.4 inches plus draindown from the heap leach pad and contaminated site runoff should power be lost.
12. The Discharger shall **immediately** notify Central Valley Water Board staff by telephone and email and **immediately** take measures to regain surface impoundment capacity in the event that freeboard levels are equal to or less than 2.0 feet plus the amount needed to hold the design storm.
13. The Discharger shall record onsite rainfall to track the magnitude of storm events and shall record surface impoundment freeboard levels in accordance with the MRP.

14. Any direct-line discharge to WMU No. 2 shall have fail-safe equipment or operating procedures to prevent overfilling.
15. WMU No. 2 shall be designed, constructed and maintained to prevent scouring and/or erosion of the liners and other containment features at points of discharge to the impoundments and by wave action at the water line.
16. Leachate removed from the primary LCRS of WMU No. 2 shall be discharged to WMU No. 2.
17. If leachate generation in the LCRS of WMU No. 2 exceeds the action leakage rate, the Discharger shall:
 - a. **Immediately** notify Central Valley Water Board staff by telephone and email.
 - b. Submit written notification within **seven days** that includes a time schedule to locate and repair leak(s) in the liner system.
 - c. If repairs do not result in a leakage rate less than the required action leakage rate, the Discharger shall submit written notification within **seven days** that includes a time schedule for replacement of the upper liner of the waste pile or other action necessary to reduce leachate production.
18. If leachate is detected in the unsaturated zone monitoring device of WMU No. 2, indicating a leak in the containment structures, the Discharger shall:
 - a. **Immediately** notify Central Valley Water Board staff by telephone and email that the containment structures have failed.
 - b. **Immediately** sample and test the liquid in accordance with the monitoring requirements in the MRP.
 - c. Submit written notification of the release to Central Valley Water Board staff within **seven days** including a time schedule to repair the containment structures.
 - d. Complete repairs of the containment structures in accordance with the approved time schedule.
19. Solids that accumulate in WMU No. 2 shall be periodically removed to maintain minimum freeboard requirements and sufficient capacity (Facility Specification C.11). Prior to removal of these solids, sufficient samples shall be obtained for characterization and classification pursuant Title 27, section 20200 et seq. The rationale for the sampling protocol used, the results of this sampling, and a rationale

for classification of the solids shall be submitted to Central Valley Water Board staff for review.

D. DESIGN AND CONSTRUCTION SPECIFICATIONS

1. Containment structures and precipitation and drainage control systems shall be constructed and maintained to prevent, to the greatest extent possible, inundation, erosion, slope failure, and washout under 1,000-year, 24-hour precipitation conditions.
2. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over their operating life.
3. Materials used to construct LCRSs shall have appropriate physical and chemical properties to ensure the required transmission of leachate over the life of the surface impoundments and the post-closure maintenance period.
4. LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by each of the mining units and to prevent the buildup of hydraulic head on the underlying liner at any time. The LCRS pump shall be capable of removing this volume of leachate.
5. The Discharger shall submit a design report including plans, specifications, a construction quality assurance plan, and a proposed action leakage rate (see Finding No. 50) for review and approval **at least 90 days prior** to constructing any new mine waste management unit.
6. The Discharger shall submit a final report documenting construction of any new mine waste management unit for review and approval prior to discharging wastes to the waste management unit.
7. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the SPRRs.

Waste Management Unit No. 1 - Heap Leach Pad

8. The heap leach unit liner system shall consist of, from the top down:
 - a. A leachate collection and removal system (LCRS) to collect pregnant cyanide solution;
 - b. A 40-mil polyvinyl chloride geomembrane;
 - c. A high-density polyethylene geonet secondary LCRS;

- d. A secondary 40-mil polyvinyl chloride geomembrane; and
 - e. A six- to twelve-inch thick engineered subgrade.
9. The heap leach unit shall have an unsaturated zone monitoring system.

Waste Management Unit No. 2 - Pregnant Pond

10. The pregnant pond liner system shall consist of, from the top down:
- a. A primary 40-mil polyvinyl chloride geomembrane;
 - b. A high-density polyethylene geonet as an LCRS;
 - c. A secondary 40-mil polyvinyl chloride geomembrane; and
 - d. A six- to twelve-inch thick engineered subgrade.
11. The pregnant pond shall have an unsaturated zone monitoring system.
12. The pregnant pond shall have a sump to collect and return leachate to the impoundment that leaks through the primary liner. The sump shall include a dedicated automated pump to remove leachate and return it to the impoundment.
13. The pregnant pond shall have a flow totalizer to measure leachate volumes pumped from the sump in order to track leakage rates.
14. The pregnant pond shall have permanent markings on the liner, or a permanent freeboard gauge so that the freeboard can be observed and recorded at any time. The markings or gauge shall have increments no greater than 6-inches.
15. The Discharger shall comply with all Storm Water Provisions listed in Section L of the SPRRs.

E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

- 1. Prior to closure, the Discharger shall submit a Final Closure and Post-Closure Maintenance Plan prepared by a California-registered civil engineer or certified engineering geologist, and that contains all applicable information required in Title 27 section 22510. The plan shall include any closure/post-closure elements proposed in the ROWD, and shall meet the requirements of this Order.
- 2. The Discharger shall comply with all Closure and Post-Closure Maintenance Specifications listed in Section G of the SPRRs.

F. FINANCIAL ASSURANCE

1. **Prior to initiating mining activities**, pursuant to Title 27, section 22510, the Discharger shall submit a report showing that it has established an irrevocable **closure fund** with the Central Valley Water Board named as beneficiary to ensure closure of WMU No. 1 and WMU No. 2 in accordance with a cost estimate approved by Central Valley Water Board staff.
2. **Prior to initiating mining activities**, pursuant to Title 27, section 22222, the Discharger shall submit a report showing that it has established an irrevocable **corrective action fund** with the Central Valley Water Board named as beneficiary to ensure funds are available to address a known or reasonably foreseeable release from WMU No. 1 or WMU No. 2 in accordance with a cost estimate approved by Central Valley Water Board staff.
3. By **1 June** of each year after the initiation of ore processing activities, the Discharger shall submit a report to the Central Valley Water Board that reports the balance of both the closure and corrective action funds or the amounts of the Guarantees and the adjustments to account for inflation in accordance with Title 27, section 22236.
4. The Discharger shall comply with all Standard Financial Assurance Provisions listed in Section H of the SPRRs.

G. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone in accordance with the MRP and the Standard Monitoring Specifications listed in Section I of the SPRRs.
2. **Prior to initiating water quality monitoring**, the Discharger shall submit a Sample Collection and Analysis Plan, prepared in accordance with section 20415(e) of Title 27, for review and approval by Central Valley Water Board staff.
3. The Discharger shall submit a report, for review and approval by Central Valley Water Board staff, proposing a Water Quality Protection Standard as specified in this Order, the MRP, and the SPRRs.
4. The Discharger shall comply with the approved Water Quality Protection Standard as specified in this Order, the MRP, and the SPRRs.
5. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to the MRP.

6. For each monitoring event, the Discharger shall determine whether the waste management unit is in compliance with the Water Quality Protection Standard using procedures specified in the MRP and the Standard Monitoring Specifications in Section I of the SPRRs.
7. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in Section J of the SPRRs.

H. PROVISIONS

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements for Industrial Facilities Regulated by Title 27, dated November 2013 (SPRRs).
2. Pursuant to Water Code section 13267, the Discharger shall comply with the MRP, which is attached to and made part of this Order. This compliance includes, but is not limited to, maintenance of waste containment facilities and precipitation and drainage controls and monitoring groundwater, the unsaturated zone, and surface waters throughout the active life of the waste management units and any applicable post-closure maintenance period. A violation of the MRP is a violation of these waste discharge requirements.
3. The Discharger shall not discharge leaching solution to the heap leach unit until the following tasks are completed and approved by Central Valley Water Board staff:
 - a. Construct a groundwater monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420.
 - b. Submit a Sample Collection and Analysis Plan.
 - c. Establish background groundwater quality through at least one year of monitoring (a minimum of 8 samples is required to develop statistical values for inorganic COCs).
 - d. Submit a report proposing a Water Quality Protection Standard including a method for calculating concentration limits.
 - e. Submit a report proposing the methods and procedures to be used to characterize all overburden materials (including soils, waste rock, and/or low-grade ore) to be used for purposes other than leaching.
4. Once mining operations commence, the Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

5. The Discharger shall maintain legible records of the volume and type of material discharged to the pregnant pond and the heap leach unit and the manner and location of the discharge. Such records shall be maintained at the facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the Central Valley Water Board and of the State Water Resources Control Board, copies of these records shall be sent to the Central Valley Water Board upon request.
6. The Discharger shall comply with all applicable provisions Title 27 that are not specifically referred to in this Order.
7. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order and of the California Water Code.
8. The Discharger shall immediately notify the Central Valley Water Board of any flooding, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
9. If the owner or operator of the facility or disposal areas changes while this Order is in effect, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation (if a corporation), the address and telephone number of the person(s) responsible for contact with the Central Valley Water Board, and a statement that complies with the signatory paragraph of General Provision K.2.e in the Standard Provisions and Reporting Requirements and that states that the new owner or operator assumes full responsibility for compliance with this Order. If the transfer request meets these conditions, the Central Valley Water Board may transfer the Order to the succeeding owner or operator at one of its regularly scheduled meetings. Failure to submit the request may be considered a discharge without requirements, a violation of the Water Code.
10. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.
11. The following reports shall be submitted pursuant to Section 13267 of the Water Code and shall be prepared by a California-registered civil engineer or certified engineering geologist:

<u>Task</u>	<u>Compliance Date</u>
A. Groundwater Detection Monitoring System Construct a groundwater monitoring system in accordance with Title 27. (see Provision H.3.a)	Prior to initiating water monitoring
B. Sample Collection and Analysis Plan Submit a Sample Collection and Analysis Plan for review and approval (see Monitoring Specification G.2)	Prior to initiating water monitoring
C. Water Quality Protection Standard Submit a report proposing a Water Quality Protection Standard for review and approval (see Monitoring Specification G.3)	Prior to application of leaching solution
D. Characterization of Overburden Materials Submit a report proposing the methods and procedures to be used to characterize all overburden materials (see Provision H.3.e)	Prior to application of leaching solution
E. Closure Financial Assurance Establish financial assurance for closure of the facility (see Financial Assurance Specification F.1)	Prior to initiating mining activities
F. Corrective Action Financial Assurance Establish a corrective action fund (see Financial Assurance Specification F.2)	Prior to initiating mining activities

G. Construction Plans

90 days prior to proposed construction

Submit construction and design plans for review and approval.
(see all Design and Construction Specifications in Section D, above and Section F of the SPRRs.)

H. Action Leakage Rate

90 days prior to proposed construction

Submit a proposed action leakage rate for the waste management unit LCRSs.
(see Design and Construction Specification D.5)

I. Construction Report

60 days prior to proposed discharge

Submit a construction report for review and approval upon completion demonstrating construction was in accordance with approved construction plans
(see Standard Construction Specifications in Section F of the SPRRs).

12. The Central Valley Water Board will review this Order periodically and may revise requirements when necessary.
13. This Order shall take effect upon the date of adoption.
14. The Discharger shall comply with all General Provisions listed in Section K of the SPRRs.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. 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 upon request.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 10 October 2014.

Original signed by:

PAMELA C. CREEDON, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2014-0138
FOR
EQUINOX RESOURCES (CALIFORNIA) INC.
AND
THE UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ZENDA MINE

KERN COUNTY

This monitoring and reporting program (MRP) is issued to Equinox Resources (California) Inc. and the United States Department of the Interior, Bureau of Land Management (hereinafter jointly referred to as Discharger) pursuant to Water Code section 13267 and incorporates requirements for groundwater, surface water, and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations, title 27, section 20005, et seq. (Title 27), Waste Discharge Requirements Order No. R5-2014-0138 (WDRs), and the Standard Provisions and Reporting Requirements for Industrial Facilities Regulated by Title 27, dated November 2013 (SPRRs). Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer. Failure to comply with this MRP, or with the SPRRs, constitutes noncompliance with the WDRs and with Water Code Section 13267, which can result in the imposition of civil monetary liability.

A. MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone in accordance with Standard Monitoring Specifications in Section I of the SPRRs. All monitoring shall be conducted in accordance with an approved *Sample Collection and Analysis Plan*, which includes quality assurance/quality control standards. The WDRs require the Discharger to submit a *Sample Collection and Analysis Plan* for review and approval by Central Valley Water Board staff.

All compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, surface water monitoring points, and leachate shall be sampled and analyzed for the parameters listed in A.1, A.2, A.3, and A.4 of this MRP.

The Discharger shall use USEPA test methods with the lowest achievable detection limit for that constituent taking any matrix interferences into account. The reporting limit shall be no higher than the practical quantitation limit. The Discharger shall report

all trace concentrations that are between the detection limit and the practical quantitation limit. All metals analyses shall be for dissolved metals.

The monitoring program of this MRP includes:

<u>Section</u>	<u>Monitoring Program</u>
A.1	Groundwater Monitoring
A.2	Unsaturated Zone Monitoring
A.3	Surface Water Monitoring
A.4	LCRS Monitoring and Annual LCRS Testing
A.5	Waste Management Unit No. 2 (Pregnant Pond) Monitoring
A.6	Solid Waste Monitoring
A.7	Facility Monitoring

1. Groundwater Monitoring

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The detection monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27.

Groundwater samples shall be collected semiannually from the background wells, detection monitoring wells, corrective action monitoring wells (if any), and any additional wells added as part of the approved groundwater monitoring system. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan. Depth to groundwater shall be measured to the nearest 0.01 feet.

Samples shall be collected and analyzed for the parameters listed in the following table in accordance with the specified frequencies:

Groundwater Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Groundwater Elevation	feet & hundredths, MSL	Quarterly ¹	Semiannually
Temperature	°F	Semiannually	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity	NTU	Semiannually	Semiannually
<u>Monitoring Parameters</u>			
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Bicarbonate	Mg/L	Semiannually	Semiannually
Total Cyanide	mg/L	Semiannually	Semiannually
WAD Cyanide	mg/L	Semiannually	Semiannually
Dissolved Metals:	ug/L	Semiannually	Semiannually
Iron			
Arsenic			
Barium			
Copper			
Lead			
Mercury			
Zinc			

¹ The Discharger shall measure the groundwater elevation in each well **quarterly**, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored. The results shall be reported semiannually, including the times of expected highest and lowest elevations of the water levels in the wells, pursuant to Title 27, section 20415(e)(15).

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420.

Unsaturated zone samples shall be collected from the monitoring network and shall be analyzed for the parameters listed in the following table in accordance with the specified frequencies. Unsaturated zone monitoring devices shall be inspected for the presence of liquid **monthly**. If liquid is detected in a previously dry unsaturated zone monitoring device, the Discharger shall **immediately** sample and test the liquid for the parameters listed in the following table:

Unsaturated Zone Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Presence of liquid	observation	Monthly	Semiannually
Flow Rate	gallons/day	Monthly	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
<u>Monitoring Parameters</u>			
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Bicarbonate	Mg/L	Semiannually	Semiannually
Total Cyanide	mg/L	Semiannually	Semiannually
WAD Cyanide	mg/L	Semiannually	Semiannually
Dissolved Metals:	ug/L	Semiannually	Semiannually
Iron			
Arsenic			
Barium			
Copper			
Lead			
Mercury			
Zinc			

The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan.

Monitoring results for the unsaturated zone shall be included in monitoring reports and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

3. **Surface Water Monitoring**

The Discharger shall operate a surface water detection monitoring system for the facility. The monitoring system shall comply with the applicable provisions of Title 27, sections 20415 and 20420. The current surface water detection monitoring system meets the applicable requirements of Title 27.

The current surface water monitoring points for the facility are:

<u>Mon Pt.</u>	<u>Description</u>
SL-1	Natural spring at toe of embankment
SL-2	Natural spring 1,000 ft. SE of mining pit
SL-3	Natural spring 1,700 ft. SW of mining pit
SL-4	Natural spring 2,600 ft. SW of mining pit
SL-5	Natural spring 2,300 ft. NW of the heap leach unit
SL-6	Caliente Creek 500 ft. upstream of Big Last Chance Canyon confluence
SL-7	Caliente Creek 500 ft. downstream of Big Last Chance Canyon confluence
SL-8	Natural spring 2,500 ft. west of the heap leach unit

For surface water detection monitoring, a sample shall be collected at each monitoring point location and analyzed for the parameters listed in the following table in accordance with the specified frequencies:

Surface Water Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Temperature	°F	Semiannually	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity	NTU	Semiannually	Semiannually
<u>Monitoring Parameters</u>			
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Bicarbonate	Mg/L	Semiannually	Semiannually
Nitrate as N	mg/L	Semiannually	Semiannually
Total Cyanide	mg/L	Semiannually	Semiannually
WAD Cyanide	mg/L	Semiannually	Semiannually
Dissolved Metals:	ug/L	Semiannually	Semiannually
Iron			
Arsenic			
Barium			
Copper			
Lead			
Mercury			
Zinc			

4. LCRS Monitoring and Annual LCRS Testing

LCRS Monitoring: The Discharger shall operate and maintain leachate collection and removal system (LCRS) sumps, record and calculate monthly leakage rates, and conduct annual testing of each LCRS in accordance with Title 27 and this monitoring program.

The primary LCRS sump beneath the pregnant pond and the secondary LCRS sump beneath the heap leach unit shall be inspected monthly for the presence of leachate, and flow shall be recorded in accordance with the following table. If

leachate is detected in a previously dry sump, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the leachate for Field and Monitoring Parameters listed in the following table. Leachate in the LCRS sump shall then be sampled for all parameters in accordance with the frequencies listed in the following table whenever liquid is present:

LCRS Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Presence of leachate	observation	Monthly	Semiannually
Flow Rate ¹	gallons/day	Monthly	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
<u>Monitoring Parameters</u>			
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Bicarbonate	Mg/L	Semiannually	Semiannually
Dissolved Metals:	ug/L	Semiannually	Semiannually
Iron			
Arsenic			
Barium			
Copper			
Lead			
Mercury			
Zinc			

¹ Flow in gallons per day from LCRS sump back to pregnant pond.

Action Leakage Rate: If monthly monitoring of the flow rate into the LCRS shows an exceedance of the Action Leakage Rate required by the WDRs, the Discharger shall follow the procedures in the WDRs under “C. Facility Specifications”. Tabulated monthly leakage rates shall be included in the semiannual monitoring reports.

Annual LCRS Testing: All LCRSs shall be tested annually pursuant to Title 27, section 20340(d) to demonstrate proper operation. The results of these tests shall be reported to the Central Valley Water Board in the Annual Monitoring

Report and shall include comparisons with earlier tests made under comparable conditions.

5. Waste Management Unit No. 2 (Pregnant Pond) Monitoring

Waste Management Unit No. 2 shall be sampled for all parameters in accordance with the frequencies listed in the following table whenever liquid is present:

Pregnant Pond Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Freeboard	feet and tenths	Weekly ¹	Semiannually
Remaining Capacity	gallons	Monthly	Semiannually
pH	pH units	Semiannually	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
<u>Monitoring Parameters</u>			
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Bicarbonate	Mg/L	Semiannually	Semiannually
Dissolved Metals:	ug/L	Semiannually	Semiannually
Iron			
Arsenic			
Barium			
Copper			
Lead			
Mercury			
Zinc			

¹ Freeboard shall be measured weekly and within 24 hours after onsite rainfall of greater than two inches in a 24 hour period. Freeboard shall be measured from the top of the surface impoundment down to the water level in the impoundment and can be measured using markings on the primary geomembrane liner or a free-standing gauge.

6. Solid Waste Monitoring

Pursuant to Provision H.3.e of the WDRs, the Discharger shall submit a report proposing the methods and procedures to be used to characterize all

overburden materials (including soils, waste rock, and/or low-grade ore) to be used for purposes other than leaching. The methods and procedures shall be established to assess acid generation potential and releases of metals and/or general mineral constituents capable of impairing surface water or groundwater quality.

7. Facility Monitoring

a. Annual Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess repair and maintenance needed for liner systems; LCRS pumps, piping and control systems; drainage control systems; groundwater monitoring wells; unsaturated zone monitoring systems; and shall assess preparedness for winter conditions including but not limited to the required surface impoundment capacity and erosion and sedimentation control. The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. Annual facility inspection reporting shall be submitted as required in Section B.3 of this MRP.

b. Major Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities and all waste management unit berms for damage **within 7 days** following major storm events capable of causing damage or significant erosion. Freeboard in the pregnant pond shall be measured and recorded within 24 hours after onsite rainfall of greater than two inches in a 24 hour period. The Discharger shall take photos of any problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Section B.4 of this MRP.

c. Rainfall Monitoring

The Discharger shall monitor and record onsite rainfall data using an automated rainfall gauge. Data shall be used in establishing the severity of storm events and wet seasons for comparison with design parameters used for waste management unit design and conveyance and drainage design. Daily data and onsite observation shall be used for establishing the need for inspection and repairs after major storm events. Rainfall

data shall be reported in the semiannual monitoring reports as required in Section B.1 of this MRP.

B. REPORTING

The Discharger shall submit the following reports in accordance with the required schedule:

Reporting Schedule

<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.1	Semiannual Monitoring Report	30 June, 31 December	1 August, 1 February
B.2	Annual Monitoring Report	31 December	1 February
B.3	Annual Facility Inspection Report	31 October	15 November
B.4	Major Storm Event Reporting	Continuous	7 days from damage discovery
B.5	Financial Assurances Report	31 December	1 June

Reporting Requirements

The Discharger shall submit monitoring reports **semiannually** with the data and information as required in this Monitoring and Reporting Program and as required in WDRs Order R5-2014-0138 and the Standard Provisions and Reporting Requirements (particularly Section I: "Standard Monitoring Specifications" and Section J: "Response to a Release"). In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format, such as a computer disk.

Field and laboratory tests shall be reported in each monitoring report. Semiannual and annual monitoring reports shall be submitted to the Central Valley Water Board in accordance with the above schedule for the calendar period in which samples were taken or observations made. In addition, the Discharger shall enter all monitoring data and monitoring reports into the online Geotracker database as required by Division 3 of Title 27.

The results of **all monitoring** conducted at the site shall be reported to the Central Valley Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility. Such records shall be legible and shall show the following for each sample:

- a) Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
- b) Date, time, and manner of sampling;
- c) Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
- d) Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
- e) Calculation of results; and
- f) Results of analyses, and the MDL and PQL for each analysis. All peaks shall be reported.

Required Reports

1. **Semiannual Monitoring Report:** Monitoring reports shall be submitted semiannually and are due on **1 August** and **1 February**. Each semiannual monitoring report shall contain at least the following:
 - a) For each groundwater monitoring point addressed by the report, a description of:
 - 1) The time of water level measurement;
 - 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - 3) The method of purging used to stabilize water in the well bore before the sample is taken including the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; results of pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water;
 - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and

- 5) A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
 - b) A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
 - c) The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report [Title 27, section 20415(e)(15)].
 - d) Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater, LCRS/leachate, unsaturated zone, surface water, and the pregnant pond. Concentrations below the laboratory reporting limit shall not be reported as "ND" unless the reporting limit is also given in the table. Otherwise they shall be reported "<" the reporting limit (e.g., <0.10). Units shall be as required in the tables in Sections A.1 through A.5 unless specific justification is given to report in other units. Refer to the SPRRs Section I "Standard Monitoring Specifications" for requirements regarding MDLs and PQLs.
 - e) Laboratory statements of results of all analyses evaluating compliance with requirements.
 - f) An evaluation of the concentration of each monitoring parameter as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under Section J: Response to a Release in the SPRRs for verified exceedances of a concentration limit.
 - g) Tabulated monthly freeboard levels in the pregnant pond with comparison to the freeboard requirement in the Facility Specifications of the WDRs.
 - h) Tabulated monthly leakage rates into the LCRS sumps with comparison to the Action Leakage Rate in the Facility Specifications of the WDRs, and a discussion of required response if the Action Leakage Rate was exceeded.
 - i) A summary of all Facility Monitoring including onsite rainfall data for the reporting period required in Section A.7 of this MRP.
 - j) A discussion about any solids that were removed from the pregnant pond during the reporting period to regain capacity.
2. **Annual Monitoring Report:** The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **1 February** covering the reporting period of the previous monitoring year. If desired, the Annual Monitoring Report may be combined with the second semiannual report, but if so, shall clearly state that it is both a semi-annual and annual monitoring report in its title. Each Annual

Monitoring Report shall contain the following additional information beyond what is required for semiannual monitoring reports:

- a) All monitoring parameters shall be graphed to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b) An evaluation of the monitoring parameters with regards to the cation/anion balance, and a graphical presentation using a Stiff diagram, a Piper graph, or a Schoeller plot.
 - c) All historical monitoring data for which there are detectable results, including data for the previous year, shall be submitted in tabular form in a digital file format such as a computer disk. The Central Valley Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27, section 20420(h)], that facilitates periodic review by the Central Valley Water Board.
 - d) Hydrographs of each well showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.
 - e) A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
 - f) A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.
 - g) The results of the annual testing of the LCRS.
 - h) Updated concentration limits for each monitoring parameter at each monitoring well based on the new background data set.
3. **Annual Facility Inspection Reporting:** By **15 November** of each year, the Discharger shall submit a report describing the results of the inspection and the repair measures implemented, preparations for winter, and include photographs of any problem areas and the repairs. Refer to Section A.7.a of this MRP, above.
 4. **Major Storm Event Reporting:** The Discharger shall notify Central Valley Water Board staff within 24 hours after a storm event of greater than two inches in

24 hours as to the status of freeboard in the pregnant pond. The Discharger shall also notify Central Valley Water Board staff within **7 days** after major storm events of any damage or significant erosion and report any needed repairs within **14 days** of completion of the repairs, including photographs of the problem and the repairs. Refer to Section A.7.b of this MRP above for requirements for performing the inspection and conducting the repairs.

5. **Financial Assurances Report:** By **1 June** of each year, the Discharger shall submit a report to the Central Valley Water Board that reports the balance of both the closure and corrective action funds or the amounts of the Guarantees and the adjustments to account for inflation in accordance with Title 27, section 22236. Refer to Financial Assurances Specifications F.1 through F.4 of the WDRs.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit, the Water Quality Protection Standard shall consist of all COCs, the concentration limit for each constituent of concern, the verification retesting procedure to confirm measurably significant evidence of a release, the point of compliance, and all water quality monitoring points for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the COCs, the concentration limits, and the point of compliance and all monitoring points. Any proposed changes to the Water Quality Protection Standard other than annual update of the concentration limits shall be submitted in a report for review and approval.

The report shall:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a waste management unit or portion of a unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with Title 27, section 20405.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

- d. Include a proposed statistical method for calculating concentration limits for monitoring parameters and constituents of concern that are detected in 10% or greater of the background data (naturally-occurring constituents) using a statistical procedure from Title 27, section 20415(e)(8)(A-D) or section 20415(e)(8)(E).
- e. Include a retesting procedure to confirm or deny measurably significant evidence of a release pursuant to Title 27, section 20415(e)(8)(E) and section 20420(j)(1-3).

The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27. 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 site, the Discharger may request modification of the Water Quality Protection Standard.

The Water Quality Protection Standard shall be updated annually for each monitoring well using new and historical monitoring data.

2. Monitoring Parameters

Monitoring parameters are a select group of constituents that are monitored during each monitoring event that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a waste management unit. The monitoring parameters for all waste management units are those listed in the tables in Section A of this MRP specified monitored medium.

3. Concentration Limits

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or
- b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

4. Retesting Procedures for Confirming Evidence of a Release

If monitoring results indicate measurably significant evidence of a release, as described in Standard Monitoring Specification I.43 of the SPRRs, then:

- a. For analytes that are detected in less than 10% of the background samples (such as non-naturally occurring constituents), the Discharger shall use the non-statistical retesting procedure required in Standard Monitoring Specification I.44 of the SPRRs.
- b. For analytes that are detected in 10% or greater of the background samples (naturally occurring constituents), the Discharger shall use one of the statistical retesting procedure as required in Standard Monitoring Specification I.45 of the SPRRs.

5. Point of Compliance

The point of compliance for the water standard at each waste management unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the unit.

6. Compliance Period

The compliance period for each waste management unit shall be the number of years equal to the active life of the unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the waste management unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program [Title 27, section 20410].

7. Monitoring Points

A monitoring point is a well, device, or location specified in the waste discharge requirements, at which monitoring is conducted and at which the water quality protection standard applies. The monitoring points for each monitored medium are listed in Section A of this MRP.

D. TRANSMITTAL LETTER FOR ALL REPORTS

A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred

since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report. The transmittal letter shall contain a statement by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate, and complete.

The Discharger shall implement the above monitoring program on the effective date of this Program.

Original signed by:

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

10 October 2014

(Date)

INFORMATION SHEET

ORDER R5-2014-0138
EQUINOX RESOURCES (CALIFORNIA), INC. AND UNITED STATES
DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT
ZENDA MINE
KERN COUNTY

Equinox Resources (California) Inc. and the United States Department of the Interior, Bureau of Land Management (hereinafter jointly referred to as Discharger) each own a portion of the property on which the Zenda Mine is located. The mine is about two miles southwest of the town of Loraine and 12 miles north of the City of Tehachapi. The mining facility is currently regulated by Order No. 97-168, adopted by the Central Valley Water Board on 8 August 1997. Order No. 97-168 no longer reflects the plans and policies of the Central Valley Water Board.

The Discharger proposes to mine and process low-grade gold and silver ore on the mining facility property located in the southern Sierra Nevada. Approximately 800,000 tons of ore and 1,000,000 tons of overburden and waste rock would be removed by open pit mining. The ore would be processed using a cyanide heap-leaching method. The facility will consist of an open-pit mine, a heap-leach unit (WMU No. 1), a surface impoundment known as a "pregnant pond" (WMU No. 2), an ore stockpile, a crushing plant, and a recovery plant. The concentrations of cyanide used in the heap leach process or discharged to the pregnant pond will not exceed hazardous concentrations. The project is anticipated to last from three to five years. The mine has not yet operated and the ore-processing facilities have not been constructed. Mining will start when the Discharger determines that it is economically feasible to do so.

Title 27, section 22480 classifies mining wastes in three Groups; A, B, and C as follows:

"Group A wastes must be managed as hazardous waste pursuant to Chapter 11 of Division 4.5, of Title 22, California Code of Regulations (Title 22), provided Regional Water Board staff finds that such mining wastes pose a significant threat to water quality. Group B mining wastes are either: wastes that consist of or contain hazardous wastes that qualify for a variance under Title 22, provided Regional Water Board staff finds that such mining wastes pose a low threat to water quality; or mining wastes that consist of or contain non-hazardous soluble pollutants of concentrations that exceed water quality objectives (WQOs) for, or could cause, degradation of waters of the state. Group C wastes are wastes from which any discharge would be in compliance with the applicable water quality control plan, including WQOs other than turbidity."

The California Regional Water Quality Control Board (Central Valley Water Board) adopted Waste Discharge Requirements (WDRs) Order 97-168 on

8 August 1997, which classified the proposed mining units as a Group C mining waste pile, a Group A mining waste pile, and a Group A mining waste impoundment as defined in California Code of Regulations, title 23, section 2510 et seq. The proposed Order updates the existing WDRs to classify the proposed waste management units as a Group B mining waste pile, and a Group B mining waste impoundment, in accordance with California Code of Regulations, title 27, section 20005 et seq. (Title 27). As a precautionary measure, the Discharger proposes to construct WMU No. 1 and WMU No. 2 to the performance standards for Group A wastes.

The facility is located in the Loraine Mining District within the Tehachapi structural block. The facility is underlain by granodiorite of the Sierra Nevada Batholith that has been intruded by rhyolitic dikes and sills. Residual soils that have formed on the granodiorite are up to 24 inches thick. The topography consists of moderately steep granitic slopes vegetated by scrub oak and pines. There are six springs within one mile of the facility and Caliente Creek is located approximately one mile to the north.

The first encountered groundwater ranges from about 10 feet to 300 feet below the native ground surface. Monitoring data indicate background groundwater quality for first encountered groundwater has electrical conductivity (EC) ranging between 700 and 1,000 micromhos per centimeter. The direction of groundwater flow is generally toward the northwest and generally follows the topography. The groundwater elevation is over 490 feet above the flow line elevation of Caliente Creek at the closest point to the facility.

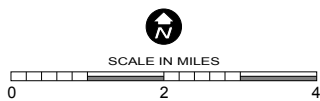
The quality of surface water in Caliente Creek and in springs located in the vicinity of the mining project is within primary and secondary drinking water standards for inorganic constituents except for concentrations of arsenic, manganese, iron, and turbidity. Surface water sampling locations have been established on Caliente Creek and at six seasonal springs within a mile of the mine.

The action to revise waste discharge requirements for this proposed mining facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code section 21000, et seq., and the CEQA guidelines, in accordance with Title 14, section 15301.

This order requires full containment of wastes and does not permit degradation of surface water or groundwater. Further antidegradation analysis is therefore not needed. The discharge is consistent with the antidegradation provisions of State Water Resource Control Board Resolution 68-16.

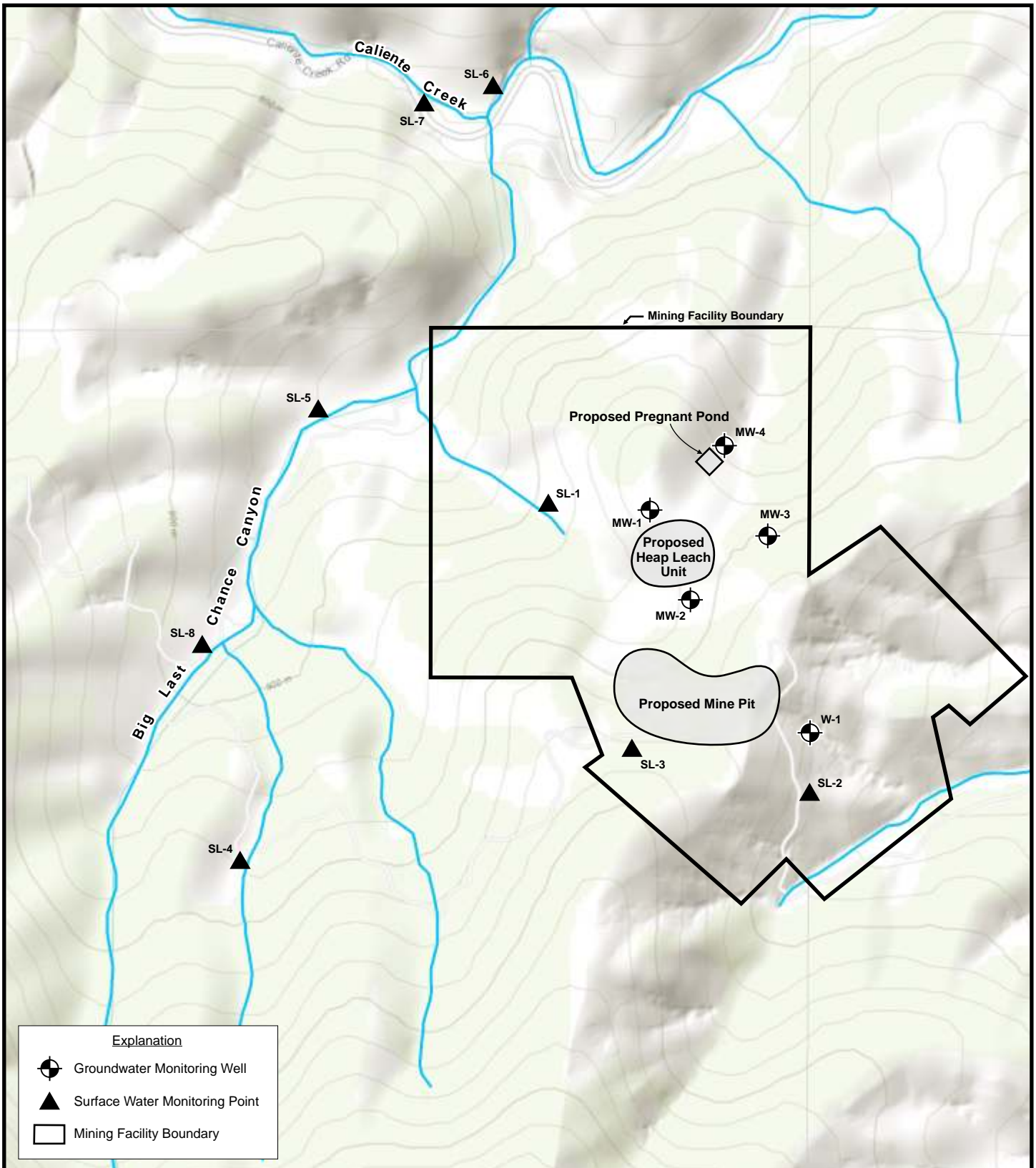


Map Source:
 ESRI's ArcGIS Online premium services
 Sections 29 and 30, T30S, R33E, MDB&M



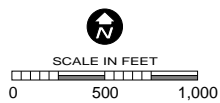
LOCATION MAP
 ORDER R5-2014-0138
 WASTE DISCHARGE REQUIREMENTS
 FOR
 EQUINOX RESOURCES (CALIFORNIA) INC.
 AND
 THE UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT
 ZENDA MINE
 KERN COUNTY

ATTACHMENT A



Explanation	
	Groundwater Monitoring Well
	Surface Water Monitoring Point
	Mining Facility Boundary

Map Source:
 ESRI's ArcGIS Online premium services
 Sections 29 and 30, T30S, R33E, MDB&M



FACILITY MAP
 ORDER R5-2014-0138
 WASTE DISCHARGE REQUIREMENTS
 FOR
 EQUINOX RESOURCES (CALIFORNIA) INC.
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 ZENDA MINE
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