

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

REVISED

MONITORING AND REPORTING PROGRAM NO. R5-2007-0006

FOR
USECC GOLD LIMITED LIABILITY COMPANY
SUTTER GOLD MINING COMPANY
SUTTER GOLD MINING INC.
US ENERGY CORP, PROPERTY OWNERS
FOR
LINCOLN MINE PROJECT
CONSTRUCTION OF WASTE PILES AND EXPANDED MINING OPERATIONS
AMADOR COUNTY

Pursuant to Section 13267 of the California Water Code, the Discharger shall comply with this Monitoring and Reporting Program (MRP) and with the companion Standard Provisions and Reporting Requirements for Mining Waste, as ordered by Waste Discharge Requirements Order No. R5-2007-0006. Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements for Mining Waste dated February 2009, constitutes noncompliance with the WDRs and with the Water Code, which can result in the imposition of civil monetary liability. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer.

This MRP is being revised at the Discharger's request to incorporate Water Quality Protection Standards and to reduce the monitoring frequency for the limited interim period (pre-mining period) prior to active mine operations. One quarter prior to the start of operations quarterly monitoring will resume as described in Section D.2. Annual Monitoring Reports shall be submitted during the pre-mining period, Quarterly Monitoring Reports shall be submitted during the mining period and all other monitoring reports shall be submitted as required in this MRP.

A. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in the Standard Provisions and Reporting Requirements for Mining Waste. A single report incorporating data from all Waste Management Units shall be submitted. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the WDRs. 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. Historical and current monitoring data shall be graphed at least once annually. Graphs for the same constituent shall be plotted at the same scale to facilitate visual comparison of monitoring data. A short discussion of the monitoring results, including notations of any water quality violations shall precede the tabular summaries. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Field and laboratory tests shall be reported in the quarterly monitoring reports. The results of any monitoring done more frequently than required at the locations specified herein shall be reported to the Board.

B. REQUIRED MONITORING REPORTS AND SUBMITTAL DATES

1. Quarterly Groundwater, Vadose Zone, Leachate and Surface Water, Monitoring Reports

All Quarterly monitoring reports shall include all water quality data and observation collected during the reporting period and submitted per the **Reporting Due Dates** in Section B.6. of this Monitoring and Reporting Program. At a minimum the sampling and data collection required in Section D of this Monitoring and Reporting Program, as well as that required in the Standard Provisions and Reporting Requirements for Mining Waste (2009) and the Waste Discharge Requirements shall be reported.

2. Annual Monitoring Summary Report

The Discharger shall submit an Annual Monitoring Summary Report to the Board covering the previous monitoring year. The annual report shall contain the information specified in Standard Provisions and Reporting Requirements for Mining Waste (2009), Section VIII.B. *"Reports to be Filed with the Board."*

3. Facility Monitoring Report

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 damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in Section XII.S of the Standard Provisions and Reporting Requirements for Mining Waste (2009).

4. Response to a Release

If the Discharger determines that there is significant statistical evidence of a release (i.e. the initial statistical comparison or non-statistical comparison indicates, for any Constituent of Concern or Monitoring Parameter, that a release is tentatively identified), the Discharger shall **immediately** notify the Board verbally as to the Monitoring Point(s) and constituent(s) or parameter(s) involved, shall provide written notification by certified mail within **seven days** of such determination and shall implement the Response to Release section of the Standard Provisions and Reporting Requirements for Mining Waste (2009).

5. Water Quality Protection Standard Report

Any proposed changes in in monitoring locations, statistical methods or concentration limits for a constituent of concern or monitoring parameter a Water Quality Protection Standard Report shall be submitted and include the information required in Section C.1 of this Monitoring Reporting Program. Any changes to Water Quality Protection Standards shall be approved by the Executive Officer in a Revised Monitoring and Reporting Program.

6. Submittal Dates

Reporting Type	Sampling Frequency and Data Reported	Reporting Period	Report Date Due
Quarterly	Daily, Weekly, Monthly and Quarterly	1 January – 31 March	30 April
		1 April – 30 June	31 July
		1 July – 30 September	31 October
		1 October – 31 December	31 January

Annual Monitoring Summary Report – includes the pre-mining Annual Monitoring Reports	31 January
Facility Monitoring Report	15 November
Response to a Release	as necessary
Water Quality Protection Standard Report	as necessary

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For the Surface Fill Unit, the Waste Rock Pile and the Underground Workings, the Water Quality Protection Standard shall consist of all constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Executive Officer shall review and approve the Water Quality Protection Standard or any modification thereto, for each monitored medium.

The report shall:

- a. Identify **all distinct bodies of surface and groundwater** that could be affected in the event of a release from a 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 data collection 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 §20405 of Title 27.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

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.

2. Constituents of Concern

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The constituents of concern for all Units at the facility are those listed in Tables 2 and 3 for the specified monitored medium.

Monitoring Parameters

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in Tables 1 through 5 for the 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 §20415 of Title 27; or
- b. By an alternate statistical method acceptable to the Executive Officer in accordance with §20415 of Title 27.

Table 5 and 6 show intra-well concentration limits for the Waste Rock Pile and Surface Fill Unit groundwater monitoring wells, respectively.

4. Point of Compliance

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

D. MONITORING

The Discharger shall comply with the monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, in accordance with Monitoring Specifications in Standard Provisions and Reporting Requirements for Mining Waste (2009). Detection monitoring for a new facility or a new Unit shall be installed, operational, and one year of monitoring data collected **prior to** the discharge of wastes. The Waste Rock Pile and Surface Fill Unit at Lincoln Mine have completed this task. A minimum of 8 samples should be used to develop background concentrations for COCs. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan, which includes quality assurance/quality control standards, that is acceptable to the Executive Officer.

All point of 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, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables 2 and 3.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Specific metals shall be analyzed in accordance with the methods listed in Table 4.

The Discharger may, with the approval of the Executive Officer, use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

1. Waste Discharge Monitoring

The Discharger shall monitor all wastes discharged to the Surface Fill Unit on a monthly basis and report the results in the quarterly Detection Monitoring Reports:

Table 1 - Waste Discharge Monitoring		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
Quantity Discharged	tons	Monthly
Remaining Capacity	acre-feet	Monthly
Minimum Freeboard	Ft. & Tenths	Monthly

2. Groundwater

The Discharger shall operate and maintain a groundwater monitoring system that complies with the applicable provisions of §20415 of Title 27 in accordance with a Monitoring Program approved by the Executive Officer. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

The Discharger shall determine the groundwater flow rate and direction beneath and around the WMUs. The results shall be reported quarterly.

Hydrographs of each well shall be submitted 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.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, and any additional wells added as part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters and frequencies specified in Table 2. During the pre-mining period samples will be collected annually, and during the mining period quarterly. The mining period shall begin at least one quarter (3 months) prior to any discharge of mining waste to any Waste Management Unit.

The monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented using a Piper graph, a Stiff diagram, or a Schueller plot.

Table 2 - Groundwater Monitoring		
<u>Parameters</u>	<u>Units</u>	<u>Pre-mining/Mining Frequency</u>
<u>Field Parameter</u>		
Groundwater Elevation	Ft., & hundredths, MSL	Annually/Quarterly
Temperature	°C	Annually/Quarterly
Specific Conductance	µmhos/cm	Annually/Quarterly
pH	pH number	Annually/Quarterly
<u>Monitoring Parameters</u>		
Total Dissolved Solids	mg/L	Annually/Quarterly
Total Alkalinity	mg/L	Annually/Quarterly
Total Hardness	mg/L	Annually/Quarterly
Bicarbonate	µg/L	Annually/Quarterly
Chloride	mg/L	Annually/Quarterly
Arsenic	mg/L	Annually/Quarterly
Aluminum	mg/L	Annually/Quarterly
Barium	mg/L	Annually/Quarterly
Cadmium	mg/L	Annually/Quarterly
Chromium	mg/L	Annually/Quarterly
Copper	mg/L	Annually/Quarterly
Lead	mg/L	Annually/Quarterly
Manganese	mg/L	Annually/Quarterly
Mercury	mg/L	Annually/Quarterly
Nickel	mg/L	Annually/Quarterly
Vanadium	mg/L	Annually/Quarterly
Zinc	mg/L	Annually/Quarterly
Selenium	mg/L	Annually/Quarterly
Thallium	mg/L	Annually/Quarterly
Sulfate	mg/L	Annually/Quarterly
Nitrate - Nitrogen	mg/L	Annually/Quarterly
Magnesium	mg/L	Annually/Quarterly
Calcium	mg/L	Annually/Quarterly
Sodium	mg/L	Annually/Quarterly
Potassium	mg/L	Annually/Quarterly
Perchlorate	mg/L	Annually/Quarterly

3. Unsaturated Zone Monitoring

Unsaturated zone monitoring systems will be installed before waste is discharged at any Waste Management Unit. The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of §20415 of Title 27 in accordance with a monitoring plan approved by the Executive Officer. 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.

Unsaturated zone samples shall be collected from the monitoring devices and background monitoring devices of the approved unsaturated zone monitoring system. The collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Table 3. All monitoring parameters shall be graphed so as to show historical trends at each monitoring point.

The lysimeters shall be checked monthly for liquid and monitoring shall also include the total volume of liquid removed from the system. Unsaturated zone monitoring reports shall be included with the corresponding semiannual groundwater monitoring and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

4. LCRS Monitoring

LCRS monitoring shall begin shall begin at least three months prior to discharge of waste to any Waste Management Unit. The LCRS sump shall be inspected quarterly for leachate. Upon detection of leachate in a previously dry LCRS, the Discharger shall immediately collect a grab sample of the leachate and continue to collect grab samples of the leachate at the frequency listed in Table 3. The leachate samples shall be analyzed for the listed constituents in accordance with the methods specified in Table 3.

All LCRSs shall be tested annually to demonstrate operation in conformance with waste discharge requirements. The results of these tests shall be reported to the Board and shall include comparison with earlier tests made under comparable conditions.

5. Underground Workings – Stope Block Drain Sumps

The Stope Block Drain Sumps and mine drains shall be inspected daily for leachate. Samples shall be collected in the underground mine drains and sumps and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table 3.

6. Surface Water Monitoring

The Discharger shall install and operate a surface water detection monitoring system where appropriate that complies with the applicable provisions of §20415 of Title 27 and has been approved by the Executive Officer.

For all monitoring points and background monitoring points assigned to surface water detection monitoring, samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table 3. All monitoring parameters shall be graphed so as to show historical trends at each sample location.

7. Facility Monitoring

a. 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 damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in section F.4.f. of Standard Provisions and Reporting Requirements. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and the repairs.

b. Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events*. Necessary repairs shall be completed **within 30 days** of the inspection. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

The Discharger shall implement the above monitoring program on the effective date of this Order. The transmittal letter accompanying monitoring reports submitted under this Order shall, as required under the Standard Provisions (*Provision 5, General Requirements, REPORTING REQUIREMENTS*), 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.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

20 April 2010

Date

Table 3- Leachate and Unsaturated Zone Monitoring		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
<u>Field Parameter</u>		
Flow Rate	gallons/month	Quarterly
Temperature	°C	Quarterly
Specific Conductance	µmhos/cm	Quarterly
pH	pH number	Quarterly
<u>Monitoring Parameters</u>		
Total Dissolved Solids	mg/L	Quarterly
Total Alkalinity	mg/L	Quarterly
Total Hardness	mg/L	Quarterly
Bicarbonate	µg/L	Quarterly
Chloride	mg/L	Quarterly
Arsenic*	mg/L	Quarterly
Aluminum	mg/L	Quarterly
Barium*	mg/L	Quarterly
Cadmium*	mg/L	Quarterly
Chromium*	mg/L	Quarterly
Copper*	mg/L	Quarterly
Lead*	mg/L	Quarterly
Manganese	mg/L	Quarterly
Mercury*	mg/L	Quarterly
Nickel*	mg/L	Quarterly
Vanadium*	mg/L	Quarterly
Zinc*	mg/L	Quarterly
Selenium*	mg/L	Quarterly
Thallium*	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Nitrate – Nitrogen	mg/L	Quarterly
Magnesium	mg/L	Quarterly
Calcium	mg/L	Quarterly
Sodium	mg/L	Quarterly
Potassium	mg/L	Quarterly
Perchlorate	mg/L	Quarterly

* - Use analysis referenced in Table 4

Table 4 – Specific Metals Analysis	
Arsenic	USEPA Method 7062
Barium	USEPA Method 6010B
Cadmium	USEPA Method 7131A
Chromium	USEPA Method 6010B
Copper	USEPA Method 6010B
Lead	USEPA Method 7421
Mercury	USEPA Method 7471A
Nickel	USEPA Method 7521
Selenium	USEPA Method 7742
Thallium	USEPA Method 7841
Vanadium	USEPA Method 6010B
Zinc	USEPA Method 6010B

**Table 5. INTRA-WELL CONCENTRATION LIMITS
for WASTE ROCK PILE WELLS**

Parameters	Units	WRP-MW-A	WRP-MW-B	WRP-MW-D
Specific Conductance	uhmos/cm	834.9	986.6	599.8
pH	units	6.38 – 8.00	4.92 – 9.23	6.60 – 7.46
Total Dissolved Solids	mg/l	517.8	710.5	417.9
Total Alkalinity	mg/l	300.5	283.2	232.7
Bicarbonate	mg/l	300.5	283.2	232.7
Chloride	mg/l	15.44	16.02	11.38
Arsenic	ug/l	30.12	5.36	7.75
Aluminum	mg/l	0.19	0.05	0.05
Barium	mg/l	0.049	0.037	0.017
Cadmium	ug/l	1.0	1.0	1.0
Chromium	ug/l	3.0	3.0	3.0
Copper	mg/l	0.0022	0.002	0.002
Lead	ug/l	1.0	1.0	1.0
Manganese	mg/l	0.13	2.57	0.36
Mercury	ug/l	0.2	0.2	0.2
Nickel	ug/l	5.76	71.04	3.92
Vanadium	ug/l	4.8	3.3	3.0
Zinc	mg/l	0.063	0.005	0.0082
Selenium	ug/l	7.915	5.8	2.0
Thallium	ug/l	1.0	1.0	1.0
Sulfate	mg/l	181.4	295.9	70.85
Nitrate – Nitrogen	mg/l	8.9	0.1	0.1
Perchlorate	ug/l	4.0	4.0	4.0

**Table 6. INTRA-WELL CONCENTRATION LIMITS
for SURFACE FILL UNIT WELLS**

Parameters	Units	SFU-MW-A	SFU-MW-B	SFU-MW-C	SFU-MW-D
Specific Conductance	uhmos/cm	315.4	284.1	203.1	619.6
pH	units	6.47 – 7.34	6.62 – 7.52	6.69 – 7.32	6.79 – 7.95
Total Dissolved Solids	mg/l	217.1	209.5	175.7	445.6
Total Alkalinity	mg/l	132.3	142.3	100.9	436.9
Bicarbonate	mg/l	132.3	142.3	100.9	315.7
Chloride	mg/l	10.72	3.3	2.86	8.66
Arsenic	ug/l	17.43	5.34	6.14	19.85
Aluminum	mg/l	0.05	0.05	0.05	0.05
Barium	mg/l	0.0029	0.12	0.55	0.099
Cadmium	ug/l	1.0	1.0	1.0	1.0
Chromium	ug/l	3.0	3.0	3.0	3.0
Copper	mg/l	0.002	0.002	0.002	0.002
Lead	ug/l	1.0	1.0	1.0	1.0
Manganese	mg/l	0.58	0.21	0.12	0.41
Mercury	ug/l	0.2	0.2	0.2	0.2
Nickel	ug/l	2.0	2.0	2.2	2.0
Vanadium	ug/l	3.7	3.3	4.1	3.3
Zinc	mg/l	0.005	0.005	0.025	0.005
Selenium	ug/l	19.49	2.0	2.0	4.1
Thallium	ug/l	1.0	1.0	1.0	1.0
Sulfate	mg/l	15.46	7.59	4.77	18.05
Nitrate – Nitrogen	mg/l	0.52	0.1	0.1	0.1
Perchlorate	ug/l	4.0	4.0	4.0	4.0