

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 90-035

WASTE DISCHARGE REQUIREMENTS
FOR
PICACHO PEAK MINE - SITE NO. 4
CHEMGOLD, INC.
North of Yuma - Imperial County

Revised on
6-25 97 by
order # 97-075

The California Regional Water Quality Control Board, Colorado River Basin Region, finds that:

1. Chemgold, Inc. (hereinafter also referred to as the discharger), 1891 Rail Avenue, P.O. Box 2015, Yuma, Arizona 85366-2015, submitted a Report of Waste Discharge dated February 5, 1990.
2. The discharger proposes to construct and operate a cyanide heap leach operation on patented land adjacent to the existing Site No. 2 operation. The proposed leach pad will cover approximately 25 acres with capacity of 2.5 million tons. Two processing ponds with a combined capacity of 6.8 million gallons (not including freeboard) and a carbon adsorption plant will be constructed.
3. Ore placement is expected at a rate of 1.0 million tons-per-year with an operating life for total recovery of ten years. For pad and pond foundations, excavated material will be used as fill and be placed in 1.5 to 2-foot lifts and compacted to 95% of maximum dry density. Nuclear densiometer tests will be conducted on a minimum of one test per 200 cubic feet of fill. The pad area will be sloped toward the center. After the foundation earthwork has been completed, a 4 to 8 inch layer of compacted fines will be placed over the foundation.
4. The discharger states that the pad liner will consist of a single layer of 60 mil HDPE. The liner will be covered by a layer of 12-ounce Geotextile and a 12 to 24-inch layer of 3/4-inch nominal free draining gravel. The ponds will have a double liner consisting of 60 mil HDPE or equivalent and a 12-ounce filter fabric drain medium between the liners. The Geotextile and gravel will extend to the perimeter berms to protect the underlying liner from falling rocks.
5. The discharger states monitoring wells, process pond sumps, and a leach pad vadose monitoring system will be constructed to detect leakage of solution. A total of 8 monitoring wells will be located adjacent to the pad and pond area. These wells are proposed to be 65 feet in depth and consist of 4-inch PVC pipe with the bottom 20 feet perforated. The hole diameter will be 6 inches with the annulus filled with free draining gravel on the bottom 25 feet followed by a 2-foot bentonite seal. The remainder of the hole will be filled with gravel and capped with 3 feet of bentonite. An air lift system will be used to purge the well and for taking samples. This system injects air by a compressor and forces the water to flow upward and out of the well. The vadose zone monitoring system will be located beneath the pad liner and down gradient

of leaching. This system will consist of a 200-foot long, 3/8 inch perforated pipe which will be placed in a trench lined with 60 mil HDPE. The pipe will connect to a lined sump.

6. The discharger states that only perched water exists below the site. This statement is based on "the lack of water in the existing pits, insufficient rainfall to provide recharge, and the lack of uniformly weathered or fractured bedrock to provide storage. The discharger bases these conclusions, mainly on a report which has been submitted to the Regional Board, done by Condor Earth Technologies and is entitled October 1989 Site 1 Report. In addition, in response to a Regional Board request, the discharger has prepared a hydrologic report dated April, 1990. This submittal was deemed adequate to determine that the Report of Waste Discharge is now complete.
7. The discharger has submitted results of acid potential tests performed on rock samples taken from the proposed mine site. Four rock samples were analyzed:
 - a. Red volcanics taken from the south side of the Apache Pit 520-foot level.
 - b. Unoxidized gneiss taken from the west side of the Dulcina pit 510-foot level.
 - c. Oxidized gneiss taken from the west side of the Dulcina Pit 510-foot level.
 - d. Alluvium taken from the drainage near the second recovery trench at about 600-foot level.

The discharger states that these four rock types are representative of the material which has and will be mined at the site. No distinction between ore and waste was made since the only difference is the quantity of economic gold present.

The results of this testing shows the ratio of the acid neutralization potential (ANP) and the acid production potential (APP) is greater than 3 to 1.

8. Upon completion of the heap leach process, each pile or segment would be flushed with fresh water or otherwise rinse-treated after completion of leaching operations to reduce cyanide concentrations to an acceptable level which would result in a mining waste classification of Group C, under Article 7, Subchapter 15, Chapter 3, Title 23 of the California Code of Regulations. The pile would then be either abandoned in place or removed elsewhere.
9. The Water Quality Control Plan for the Colorado River Basin Region of California designates the beneficial uses of ground and surface waters in this Region.
10. The beneficial uses of ground waters in the Colorado Hydrologic Unit are:
 - a. Municipal supply (MUN)
 - b. Industrial supply (IND)
 - c. Agricultural supply (AGR)

11. The Board has notified the discharger and all known interested agencies and persons of its intent to prescribe waste discharge requirements for this facility.
12. The Board in a public meeting heard and considered all comments pertaining to this discharge.
13. The Imperial County Planning Department prepared a Negative Declaration for the subject project. The Negative Declaration was approved and a Conditional Use Permit #878-89 was issued by Imperial County Planning Department on November 6, 1989, thus fulfilling the CEQA requirements for this project.

IT IS HEREBY ORDERED, that the discharger shall comply with the following specifications:

1. The cyanide solutions shall be contained only in the processing system or in other leak-proof containers.
2. There shall be no wind transport of cyanide solution or ore containing cyanide away from the leaching area.
3. The heap leach ore piles shall be underlain by a synthetic liner which has a maximum permeability of 1×10^{-10} cm/sec and a minimum thickness of 40 mils. An equivalent liner may be approved by the Regional Board's Executive Officer if the discharger demonstrates that the equivalent liner will function as well or better than the above-specified minimum system.
4. Each cyanide solution containment basin, each cyanide-bearing sludge containment basin, shall be underlain by a double liner with a leachate collection and removal system installed between the two synthetic liners, or an equivalent double containment system approved by the Executive Officer prior to construction. Each synthetic liner shall have a permeability which does not exceed 1×10^{-10} cm/sec. The bottom liner shall have a minimum thickness of 40 mils. The upper liner shall be equivalent to a reinforced weather-resistant synthetic material with a minimum thickness of 36 mils. Each basin shall contain a double-lined leak detection and withdrawal sump. The double liners with leachate collection and removal system shall extend up the sidewalls to at least 2.0 feet above the maximum working depth of the cyanide solution and/or sludge contained therein. The remaining sidewalls of both basins shall have a single 36 mils reinforced weather-resistant synthetic liner, or an equivalent liner approved by the Regional Board's Executive Officer. Other design details for protection of the quality of the State waters shall also be approved by the Executive Officer. If tanks are used for containment of processing solutions, such tanks shall be situated within a lined and diked area designed to contain potential spillage or leakage of the entire tank volume and either: (1) be located entirely above ground, or (2) provided with a double liner and leak detection and recovery sump if located partially underground. Tank designs shall also comply with other applicable laws and regulations. Lined, diked areas for the sole purpose of temporary storage (less than 670 days) of tank leakage and/or infrequent storm run-off from the processing area shall have a single 36 mil reinforced weather-resistant synthetic liner, or an equivalent liner approved by the Executive Officer.

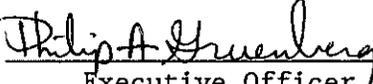
5. The liner system shall be documented by the discharger and approved by the Executive Officer to be able to withstand the static and dynamic loads that will be applied to the liner system.
6. All drainage and collection facilities used to contain or transport leaching solution shall be effectively sealed to prevent leakage of these liquids.
7. The processing area shall be protected from any run-on, washout, or erosion which could occur as a result of a storm having a predicted frequency of once in 100 years.
8. There shall be no discharge of process wastewater at any location without prior approval from the Executive Officer.
9. Adequate measures shall be taken to insure that liners remain intact throughout the duration of the leaching activity.
10. Leached ore residual shall not be placed in perennial, intermittent, or ephemeral stream channels unless provisions are made to divert runoff around the waste in a non-erosive manner. Waste shall not be placed where it can be eroded by stream flows or cause accelerated stream bank erosion.
11. Prior to removal of leached ore residue from a lined pad, for disposal, the cyanide contained therein shall be neutralized as described in Specification No. 15, below.
12. Ore residue may be abandoned on a pad, provided the cyanide in the ore is neutralized as described in Specification No. 15, below, and all other necessary and applicable closure requirements are complied with.
13. All industrial waste materials not covered by said Article 7, Subchapter 15 shall be discharged at a Board-approved waste management facility. Any hazardous waste containers shall be rendered unusable prior to final disposal.
14. The heap leach processing area shall be diked, and containment basins shall be provided to impound all storm water drainage from the piles and from the cyanide solution collection and transport facilities during a maximum probable one-hour storm, as set forth in Department of Water Resources Bulletin No. 195 for Yuma, AZ. In addition, containment capacity shall be provided for 24 hours of cyanide solution drain down from the piles. Also, standby emergency facilities shall be available to assure continual circulation of the leaching solution if at any time it is determined that a planned processing configuration or rate could in an emergency result in flow in excess of existing basin storage capacity. The additional storm storage capacity shall be provided before the new processing configuration is started.
15. When abandoning leached ore residue, the procedure for determination of whether free cyanide (CN⁻) in the ore residue has been neutralized to a satisfactory level shall be as follows:
 - a. A sampling grid for the ore pile or segment on the leach pad shall be submitted for approval by the Executive Officer. The sampling grid shall contain a total of at least ten sampling locations on the ore pile or segment being abandoned.

- b. The sample to be analyzed from each sampling location shall contain 100 grams as an aliquot of samples taken as set forth below, except that no sample shall be taken within three feet above the plastic liner unless special provisions are made to avoid penetrating the liner or for sealing said penetrations:
 1. An ore pile thirty feet or less in depth shall have samples taken at 25, 50, and 75 percent of the depth.
 2. An ore pile greater than thirty feet in depth shall have samples taken every ten feet of depth.
 - c. The sample analysis procedure shall be as set forth in Attachment A.
 - d. The maximum allowable free cyanide (CN⁻) shall not exceed the following levels in the filtrate portion of a 5:1 extraction.
 1. 90 percent of at least 10 samples shall contain less than 5 mg/l free cyanide (CN⁻) in the filtrate.
 2. None of the samples shall contain more than 10 mg/l free cyanide (CN⁻) in the filtrate.
 - e. For any sampling location that indicates a free cyanide level in excess of 10 mg/l in the filtrate, the areal extent of the inadequately detoxified area shall be determined and detoxified so that the cyanide levels in that particular ore pile will comply with the limitations contained in this Specification.
16. Adjacent and contiguous ore piles or segments shall also be sampled simultaneously when any pile or segment is to be abandoned. If any additional processing is done in the sampled areas, the piles and segments tested will require additional neutralization and testing prior to abandonment.
 17. The discharger shall maintain a ground water monitoring well network and a vadose zone monitoring system as approved by the Executive Officer.
 18. At least 60 days¹ prior to commencement of construction of each component of the facility, the discharger shall submit a technical report to the Board for approval by the Executive Officer, which shall include a plan showing in detail the proposed construction of that component.
 19. At least 10 days prior to commencement of operations, the discharger shall submit a certificate to the Board, signed by a California Registered Civil Engineer or Certified Engineering Geologist, stating that the pads, containment basins, leakage detection system, flood protection and attendant facilities, and disposal areas are constructed in accordance with the technical report as approved by the Executive Officer to meet the requirements of this Board Order.

¹ 60 days unless a lesser period is approved by the Executive Officer in writing.

20. At least 10 days prior to loading ore onto the pads, the discharger shall notify the Board to allow sufficient time to schedule a staff evaluation of construction and inspection procedures utilized by the discharger for liner installation.
21. The discharger shall submit to the Board, at least 30 days prior to commencement of operations, written adequate assurance as determined by the Executive Officer that money is committed in an amount sufficient to insure neutralization of all cyanide, plus cleanup and closure of the processing and tailings disposal site upon abandonment of facilities, in a manner that will not adversely affect water quality.
22. Lack of construction or operational activity on the site for a period of one year shall constitute abandonment for the purpose of this Board Order.
23. The discharger shall maintain devices installed in the ore piles which permit measurement of solution depth (the hydraulic head) over the liner beneath that ore pile.

I, Philip A. Gruenberg, 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, Colorado River Basin Region, on June 27, 1990.



Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ATTACHMENT A TO ORDER NO. 90-035

ANALYTICAL PROCEDURE
FOR
IONIC CYANIDE
Also known as free soluble cyanide

Description: Ionic cyanide and most weak complexes are soluble in distilled water. The strong complexes of ions, although normally soluble, are bound too tightly to the particle surface and are not solubilized. The sample is leached with distilled water in a single pass, flow-through manner. The leachate is collected, alkalized for preservation, and made up to a definite volume. This leachate sample is then analyzed via "Standard Methods" 412 C or E. Method 412 D may not be used.

Apparatus:

- 1) Large glass funnel, the stem throat plugged with glass wool;
- 2) Large glass funnel with glass fiber filter paper: Whatman GF/C, 934-AH, or equivalent.
- 3) Balance capable of weighing to nearest 0.01 g.
- 4) 500 ml volumetric flasks.
- 5) Items necessary to perform cyanide analysis as described in narrative above.

Reagents:

- 1) 2.5 N NaOH (100 g NaOH/l)
- 2) Reagents necessary to perform cyanide analysis as described in narrative above.

Procedure:

Weigh out, to nearest 0.01 g, 100 ± 1 g of samples as received. Place in glass funnel, either glass wool plugged or with filter paper. Add 50.00 ml of 2.5 N NaOH to 500 ml volumetric flask and place it so as to catch the filtrate from the funnel. Pour 50 ml of distilled (or deionized) water onto the solid sample and allow to percolate through. When liquid level is even with the top of the solids, add an additional 50 ml of water. Repeat the addition of water until a total of 400 ml H₂O has been used. Make up volume in volumetric flask to mark with distilled water. This constitutes the sample ready for analysis.

The titrametric (412C) and the ion selective probe (412E) require no further preparation. The sample is then read directly by either titrametric (412C) or the ion selective probe (412E) and the results indicating the amount of ionic cyanide reported in mg/l.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 90-035

FOR

PICACHO PEAK MINE - SITE NO.4

CHEMGOLD, INC.

North of Yuma - Imperial County

Location of Discharge: Section 16, R14S, R22E, SBB&M

The discharger shall submit to the Regional Board monthly reports containing the following:

MONITORING AND REPORTING PROGRAM NO. 1

- A. The current status of mining operations as to whether the operation is active or inactive.
- B. An estimate of the total amount of ore (tons) presently being processed per month.
- C. The amount of liquid collected daily in each seepage collection sump and corresponding liner permeability in centimeters per second.
- D. At least one analysis per month for free cyanide and total cyanide in ground water from each ground water monitoring well, and of any water found in each seepage collection sump.
- E. Analysis for free cyanide and total cyanide for any liquid found in the vadose zone monitoring system.

MONITORING AND REPORTING PROGRAM NO. 2

- A. Immediate reporting of any accidental spillage, leakage, or release of waste material, including immediate measures being taken to correct same.
- B. Upon request from this Regional Board's Executive Officer, the discharger shall furnish special technical and/or monitoring reports on the treatment and discharge of wastes, and on the integrity of the cyanide solution containment system.
- C. At least 30 days prior to any proposed abandonment of leached ore residues or discharge of wastewater, or termination of the operation described in this Board Order, the discharger shall submit a copy of the results of analyses of the cyanide concentration in the leached ore residue and in the wastewater in accordance with Discharge Specification No. 15, and shall request a Regional Board staff inspection to approve the proposed discharge or cleanup procedure.

- D. Report of completion of cleanup, as described in Item C. above, of premises shall be submitted to the Regional Board in writing within two weeks following completion of work.

The above monitoring program shall be implemented and/or maintained immediately upon adoption of Board Order No. 90-035.

REPORTING

Monthly monitoring report shall be submitted by the 15th day of the following month.

Forward monitoring reports to:

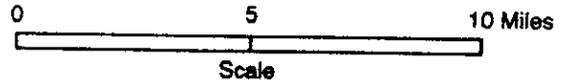
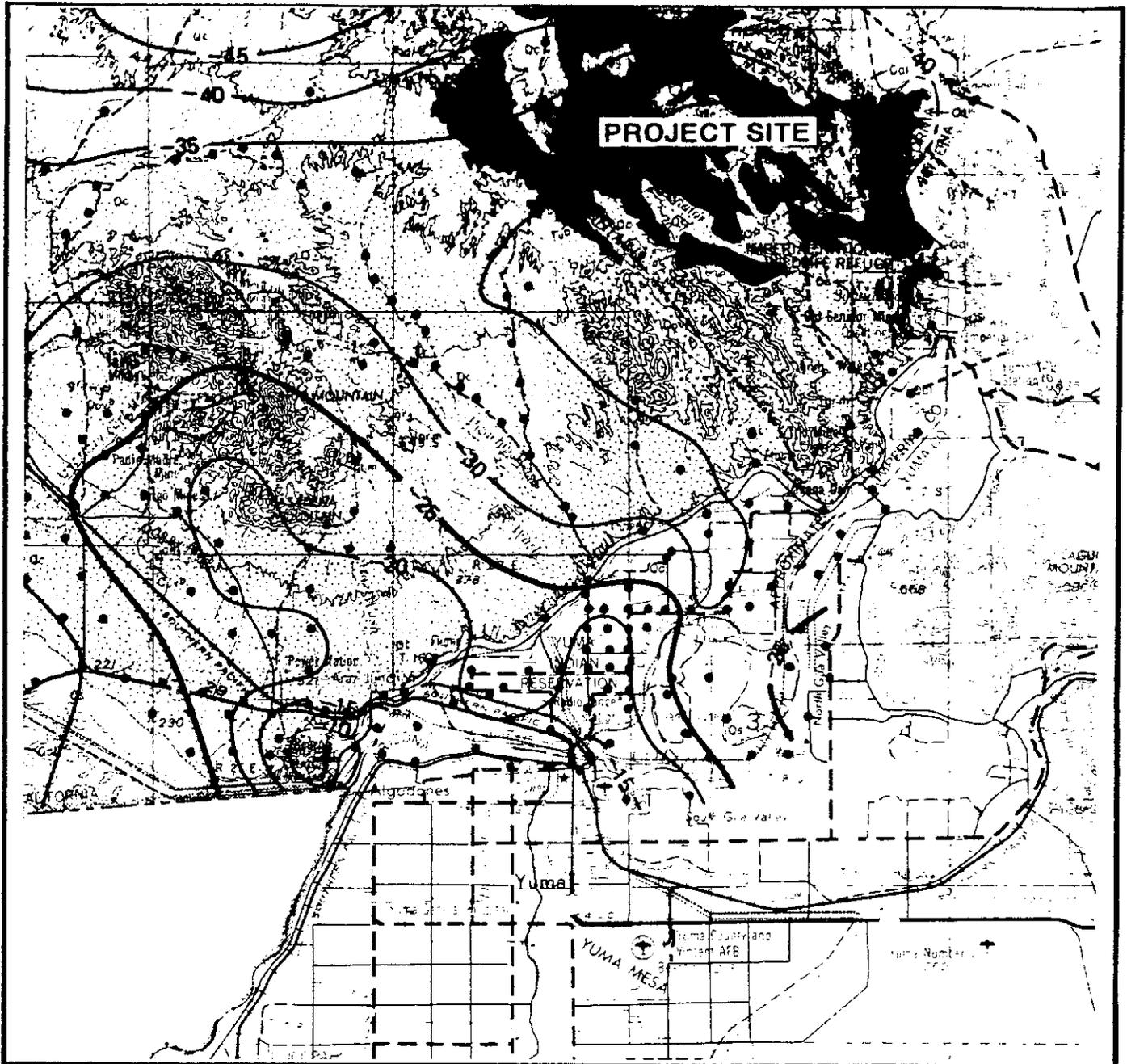
California Regional Water Quality Control Board
Colorado River Basin Region
73-271 Highway 111, Suite 21
Palm Desert, CA 92260

ORDERED BY:

Philip A. Greenberg
Executive Officer

June 27, 1990

Date



SITE MAP
PICACHO PEAK MINE - SITE NO.4
CHEMGOLD, INC.
North of Yuma - Imperial County
Section 16, T14S, R22E, SBB&M
Reference: Bouguer Gravity Map of Calif., 1979