CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN

ORDER NO. 87-76

WASTE DISCHARGE REQUIREMENTS
FOR
PICACHO PEAK MINE - SITE NO. 1
CHEMGOLD, INC.
North of Yuma - Imperial County

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

1. Chemgold, Inc. (hereinafter also referred to as the discharger), P.O. Box 2015, Yuma, Arizona, 85364, submitted an updated Report of Waste Discharge dated June 29, 1987.

2. The discharger is currently conducting a cyanide heap leaching operation at the Picacho Peak Mine. The Site No. 1 pad, which is one of three existing leach pads at the mine, is expected to process a total of 3.6 million tons of ore. The ore is being stacked in 20-foot lifts to a maximum height of 60 feet.

3. The existing heap leach facilities at Site No. 1 consist of the following:

   a. One (1) leach pad lined with a 20-mil polyvinyl chloride (PVC) liner; with perimeter collection ditches lined with a 36 mil reinforced PVC liner;
   b. Two (2) cyanide solution containment basins that are adjacent to the leach pad, and each lined with a 36-mil chlorinated polyethylene reinforced (CPER) liner;
   c. One (1) emergency holding basin for stormwater overflow lined with a 36-mil chlorinated polyethylene reinforced (CPER) liner; and
   d. A gold recovery system mounted on a concrete slab.

4. The leach pad consists of a compacted soil base overlain by a 20-mil PVC liner, which is covered with a protective/drainage sand layer and a perforated pipe drainage system.

5. The ore on the leach pad is being processed with dilute cyanide solution by ponding on the surface of the ore pile and percolating through said pile. The pregnant solution drains from the lined pad into a collection ditch and then flows into a containment basin from which it is pumped to the gold recovery system. The barren solution from the recovery system is discharged into another basin, where cyanide is added to bring the concentration to the appropriate strength, and then recirculated through the ore pile. Upon completion of the ore-leaching process, the leached ore would be detoxified to reduce the cyanide concentration to an acceptable level. The processing site is located (on nonsurveyed lands) about one mile north and one-half mile east of the NE corner of Section 16, T14S, R22E, SBB&M, and about 20 miles north of Yuma, Arizona.

rescinded June 26/91

6. The Regional Board previously established waste discharge requirements for Picacho Peak Mine Site No. 1 under Board Orders No. 82-3 and 82-31.

7. The Regional Board is updating the waste discharge requirements to comply with Section 13263 of the California Water Code and to incorporate the requirement to double-line the existing containment basins within a specified time period.

8. The discharger submitted the retrofitting plans for the Site No. 1 containment basins on August 13, 1987, for review and approval by the Regional Board's Executive Officer. The retrofitting plans consist of:

   a. Removing the solution from the basins,

   b. Cleaning up the bottom of the basin by removing residual liquid and sludges,

   c. Sampling of the soil underneath the existing liners, and implementing a soil cleanup program if soil contamination is detected.

   d. Installing double liners with a leachate collection and removal system. The new double liner system will consist of the following:

      1. Secondary liner (40 mil)
      2. Leachate collection pipes
      3. Permeable interliner
      4. Primary liner (36 mil reinforced)
      5. Leachate removal system

9. The Water Quality Control Plan for the Colorado River Basin Region of California was adopted by the Regional Board on November 14, 1984. The Basin Plan contains water quality objectives for the Colorado Hydrologic Unit.

10. The beneficial uses of the ground water of Colorado Hydrologic Unit are:

    a. Municipal supply
    b. Industrial supply
    c. Agricultural supply

11. The ground water underlying Site No, 1 is a relatively small perched zone with the depth to water ranging from 5 to 28 feet. Water quality data taken in December, 1986 from the monitoring wells show the total dissolved solids (TDS) ranging from 1720 mg/l to 13,590 mg/l with a median value of 4860 mg/l. The mine pits adjacent to the site have been excavated to over 100 feet without intercepting ground water. The supply water for the mine is piped from a well 4 miles downgradient of the site near the Colorado River.

12. The existing leakage detection system for Site No. 1 consists of twelve ground water monitoring wells.

13. The Board has notified the discharger and interested agencies and persons of its intent to update waste discharge requirements for this facility.

14. The Board in a public meeting heard and considered all comments pertaining to the discharge.

15. These waste discharge requirements govern an existing facility, which the discharger is currently operating, and therefore is exempt from the provisions of the California Environmental Quality Act in accordance with Section 15301, Chapter 3, Title 14 of the California Administrative Code.

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

A. Prohibition

1. The operation of the existing containment basins involving continued use of cyanide solution is prohibited on and continuing after December 31, 1987, unless the basins are retrofitted with double liners and a leachate collection and removal system as described in Discharge Specification No. 4 below.

B. Discharge Specifications

1. Neither the mining process nor the discharge of wastewater or other wastes shall create a pollution or a nuisance as defined in Division 7 of the California Water Code.

2. The cyanide solution shall be contained only in the processing system or in other leakproof containers.

3. There shall be no wind transport of cyanide solution or ore containing cyanide beyond the containment facilities.

4. The cyanide solution containment basins shall be retrofitted as described herein, if their operation involving use of cyanide solution is to continue beyond the specified time period of December 31, 1987. Each basin shall be lined with two synthetic liners with a leachate collection and removal system installed between the liners. 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. The leachate collection and removal system shall consist of a permeable subdrain layer which covers the bottom of the basin and the sides up to the working water level.

5. All drainage and collection facilities used to contain or transport leaching solutions shall be effectively maintained to assure that they remain sealed to prevent leakage of these liquids.

6. The entire mining facility shall be protected from any run-on, washout, or erosion which could occur as result of a storm having a predicted frequency of once in 100 years, and based on time of concentration at the processing area, as set forth in Department of Water Resources Bulletin No. 195 for Yuma, Arizona.

7. Adequate storm water storage shall be provided to contain storm drainage and a 24-hr draindown from the heap leach pad and the cyanide solution collection ditches during a maximum probable one-hour storm as set forth in Department of Water Resources Bulletin No. 195 for Yuma, Arizona.

8. The leach pad and the containment basins shall be diked to prevent runoff of storm water; and a minimum freeboard of two feet shall be maintained at all times.

9. There shall be no intentional discharge of process solution outside the containment system without prior approval from the Regional Board.

10. Adequate measures shall be taken to insure that the liners will not be punctured for the duration of the leaching activity.

11. Adequate measures shall be taken to assure that unauthorized persons and mammals are effectively excluded from the processing area.

12. Prior to removal of ore tailings from the leach pad for disposal, or abandonment in place, the ore tailings shall be detoxified to reduce the concentration of free cyanide and shall be treated as necessary to reduce the concentration of extractable metals to below hazardous levels, as specified under Article 11, Division 4, Title 22 of the California Administrative Code. The detoxified ore tailings shall meet the requirements for classification as a Group C mining waste as prescribed in Section 2571 of Subchapter 15, Chapter 3, Title 23 of the California Administrative Code.

13. The discharger shall sample, and analyze the ore tailings for free cyanide and extractable metals to determine proper detoxification and treatment, in accordance with the sampling plan required under Provision No. 8.

14. The procedure for preparing the samples for the analyses of free cyanide in the detoxified ore tailings shall be as set forth in Attachment A.

15. The maximum allowable free cyanide in the detoxified ore tailings shall not exceed the following levels in the filtrate portion of a 5/1 extraction:

    1. Ninety percent of the samples shall contain less than 10 mg/l free cyanide in the filtrate.

    2. None of the samples shall contain more than 20 mg/l free cyanide in the filtrate.

    For any sampling location that indicates a free cyanide level in excess of 20 mg/l in the filtrate, the areal extent of the inadequately detoxified area shall be determined and detoxified so that the cyanide levels will comply with the limitations specified above.

16. The procedure, for selecting the method for analysis of extractable metals in the treated ore tailings, and the list of metals to be analyzed shall be as set forth in Attachment B.

17. The maximum allowable concentrations of the extractable metals in the treated ore tailings shall not be greater than ten times the soluble threshold limit concentration (STLC) values listed under Section 66699, Article 11, Chapter 30, Division 4, Title 22 of the California Administrative Code.

18. The ore tailings 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 streamflows or cause accelerated streambank erosion.

19. All industrial waste materials, used cyanide containers, or other hazardous materials shall be properly treated and/or discharged at an appropriate waste management facility.

20. The discharger shall maintain ground water monitoring wells and a vadose zone monitoring system, if feasible, in locations as approved by the Regional Board's Executive Officer.

21. All sampling, preservation, storage, and analyses shall be conducted in accordance with current EPA procedures or in acccordance with the then-current edition of Standard Methods for the Examination of Water and Wastewater. All hazardous waste chemical analyses shall be conducted at a laboratory certified by the California Department of Health Services to perform such analyses or as approved by the Regional Board's Executive Officer.

C. Provisions

1. At least 10 days prior to operation of the basins after retrofitting, the discharger shall:

   a. Notify the Regional Board to allow sufficient time to schedule a staff evaluation of construction and inspection procedures utilized by the discharger for liner installation; and

   b. Submit a certificate, signed by a California registered civil engineer, stating that the retrofitting has been completed in accordance with the design and construction plans approved by the Regional Board's Executive Officer.

2. Within 60 days from the date of adoption of this Order, the discharger shall submit a ground water sampling and analysis plan for review and approval by the Regional Board's Executive Officer.

3. The discharger shall comply with "Monitoring and Reporting Program No. 87-76", and future revisions thereto, as specified by the Executive Officer.

4. Prior to any significant modifications in this facility which could result in material change in the quality or quantity of wastes discharged, or any material change in location of discharge, the discharger shall report in writing to the Regional Board allowing sufficient time for Board consideration and action.

5. In the event of any change in operation, or in control or ownership of land or facilities owned or controlled by the discharger, the discharger shall:

   a. Notify the Regional Board of such change; and

   b. Notify the succeeding owner or operator by letter of the existence of this Order, a copy of which shall be filed with the Regional Board.

6. Within 6 months from the date of adoption of this Order, the discharger shall submit a closure and post-closure maintenance plan for review and approval by the Regional Board's Executive Officer. The closure and post-closure maintenance plan shall describe the methods and controls to be used to assure protection of the quality of surface and ground waters of the area upon cessation of operations and with any proposed subsequent use of the land. Such plan shall be prepared by or under the supervision of a California certified engineering geologist or registered civil engineer.

7. The discharger shall submit to the Regional Board, by the 15th day of January of each year, written assurance that monies are available in an amount sufficient to ensure the closure and post-closure maintenance of the site in a manner that will not pose an adverse threat to the quality of the surface and ground waters. The discharger shall also assure that sufficient monies are available to the Regional Board in the case of earthquakes or other unforeseen threat to water quality.

   The Regional Board, with the adoption of these waste discharge requirements, authorizes the Executive Officer to enter into an agreement with the discharger providing for such assurances. If the discharger does not provide adequate financial assurances, as described in this provision and specifically if the discharger violates the agreement entered into by the Regional Board's Executive Officer and the discharger, such violation shall be grounds for the Regional Board to order a cessation of all operations at the site. In addition, the amount of the agreement made by the discharger shall constitute a lien upon the recordation of a notice of lien in the office of the appropriate County Recorder.

8. Prior to removal of ore tailings for disposal, or abandonment in place, the discharger shall submit a sampling plan specifying the locations and number of samples to be collected for the analysis of free cyanide and extractable metals as required under Discharge Specification No. 13, for review and approval by the Regional Board's Executive Officer.

9. Lack of operational activity on the site for a period of one year shall constitute abandonment for the purpose of requiring closure and subsequent rescission of this Order; but lack of interim operational activity does not excuse submittal of information required under Monitoring and Reporting Program No. 87-76.

10. The discharger shall immediately inform the Executive Officer of any spillage beyond any of the containment facilities or elsewhere at the site, and of storm damage to any of the containment facilities along with a proposal to correct same.

11. The discharger shall process no more than 3.6 million tons of ore at this site under this Order.

12. This Order supersedes Board Orders No. 82-3 and 82-31.

13. The Regional Board will review this Order periodically and may revise these requirements when necessary.

I, Arthur Swajian, 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 September 23, 1987.

Arthur Swajian
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ATTACHMENT A

SAMPLE PREPARATION PROCEDURE
FOR
IONIC CYANIDE
also known as free 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. Considering this, it would therefore be adequate to leach the sample 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;

or

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) Other items necessary to perform cyanide analysis as described above.

Reagents:

1) 2.5 NaOH (100 g NaOH/1)

2) Other reagents necessary to perform cyanide analysis as described above.

Procedure:

Weigh out, to the nearest 0.01 g, 100g of sample as received. Place sample in a glass funnel with filter paper or plugged with glass wool. Add 50.00 ml of 2.50 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 400 ml H_2O has been used. Make up volume in volumetric flask to mark with distilled water. The resulting filtrate is now ready for analysis.

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

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ATTACHMENT B

PROCEDURE FOR THE DETERMINATION
OF EXTRACTABLE METALS

A. Samples from each location as approved by the Regional Board's Executive Officer, shall be composited and tested for the net acid/base potential utilizing the procedure in "Field and Laboratory Methods Applicable to Overburden and Minesoil", (PB-280-495), March 1978; pp. 47-50 & 69-72.

1. If the net acid/base potential indicates a presence of net acid forming potential, the composites shall be subjected to the waste extraction test described in Section 66700, Article 11, Chapter 30, Division 4, Title 22 of the California Administrative Code.

2. If the net acid/base potential indicates an absence of net acid forming potential, the composites shall be subjected to a waste extraction test similar to that in A (1) above but utilizing distilled water as the extractant.

B. The resultant test extracts shall be analyzed as follows:

1. All of the extracts shall be analyzed for copper and iron.

2. Ten percent of the extracts shall be analyzed for the metals listed under Section 66699, Article 11, Chapter 30, Division 4, Title 22 of the California Administrative Code.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 87-78
FOR
PICACHO PEAK MINE - SITE NO. 1
CHEMGOLD, INC.
North of Yuma - Imperial County

Location: 1 mile north and ½ mile east of NE corner of Section 16, T14S, R22E, SBB&M

Monitoring and Reporting No. 1

1. The discharger shall implement the following monitoring program at the site:

   Ground Water Monitoring

   All wells shall be sampled in accordance with the sampling and analyses plan approved by the Regional Board's Executive Officer. Grab samples shall be collected on a monthly basis at each location containing liquid, and shall be analyzed for the following constituents:

	Parameter	Units
a)	Field Measurements	
	pH	-
	Temperature	°F or °C
	Depth to Ground Water	feet
b)	Laboratory Measurements	
	Sodium	mg/l
	Sulfate	mg/l
	Chloride	mg/l
	Free Cyanide	mg/l
	Total Cyanide	mg/l
	Total Dissolved Solids	mg/l

   The report shall indicate whether a particular monitoring well is dry or whether moisture is present. In the case of the latter, a sample shall be taken if feasible, and analyzed for the constituents listed above.

2. The discharger shall submit to the Regional Board monthly reports by the 15th day of the following month, containing the following:

   A. The current status of mining operations as to whether the operation is active or inactive.

   B. Total amount of ore (tons) processed to date on the leach pad.

   C. The results of the ground water analyses listed above.

Monitoring and Reporting No. 2

1. Immediate reporting of any accidental spillage, leakage or release of process solution or waste material, including immediate corrective measures being taken to limit detrimental effects to water quality. (Reports shall be forwarded immediately and if at all possible, shall be preceded by phone communication to the Regional Board's office, phone no. (619) 346-7491

2 Report of completion of cleanup of accidental releases shall be submitted to the Regional Board in writing within one week following completion of work.

3. Upon request from the 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.

4. At least 30 days prior to any proposed removal or abandonment of ore tailings, or discharge of wastewater, or termination of the operation described in this Order, the discharger shall submit a copy of the results of analyses of cyanide and other hazardous substances in the ore tailings and in the wastewater.

Copies of the reports submitted to the Board pursuant to this Monitoring and Reporting Program shall be maintained at the operations site for a period of one year, and shall be made available to staff of the Regional Board upon request.

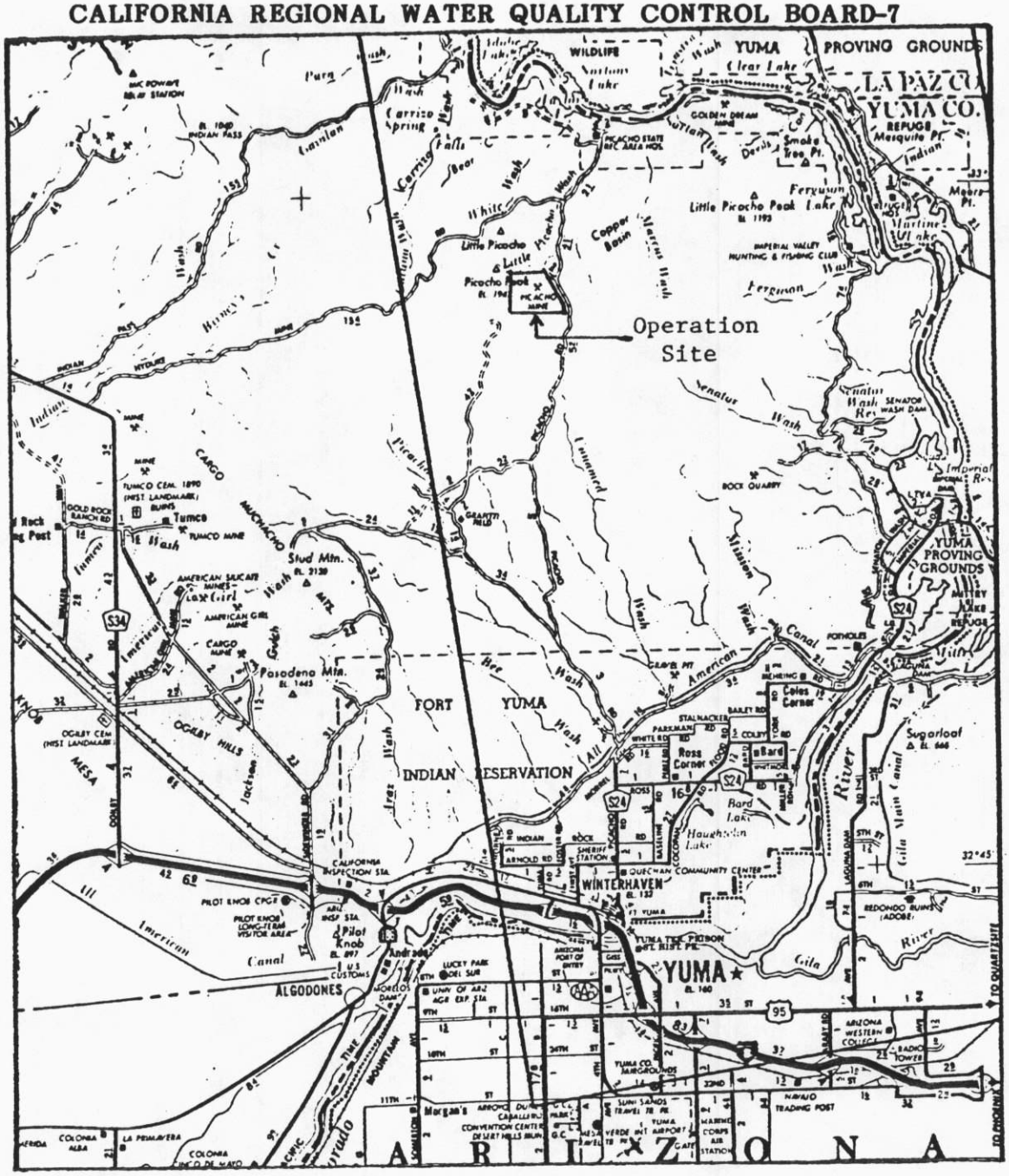
Mail reports to:

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

ORDERED BY: Arthur Swajian
Executive Officer

September 23, 1987
Date

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD-7



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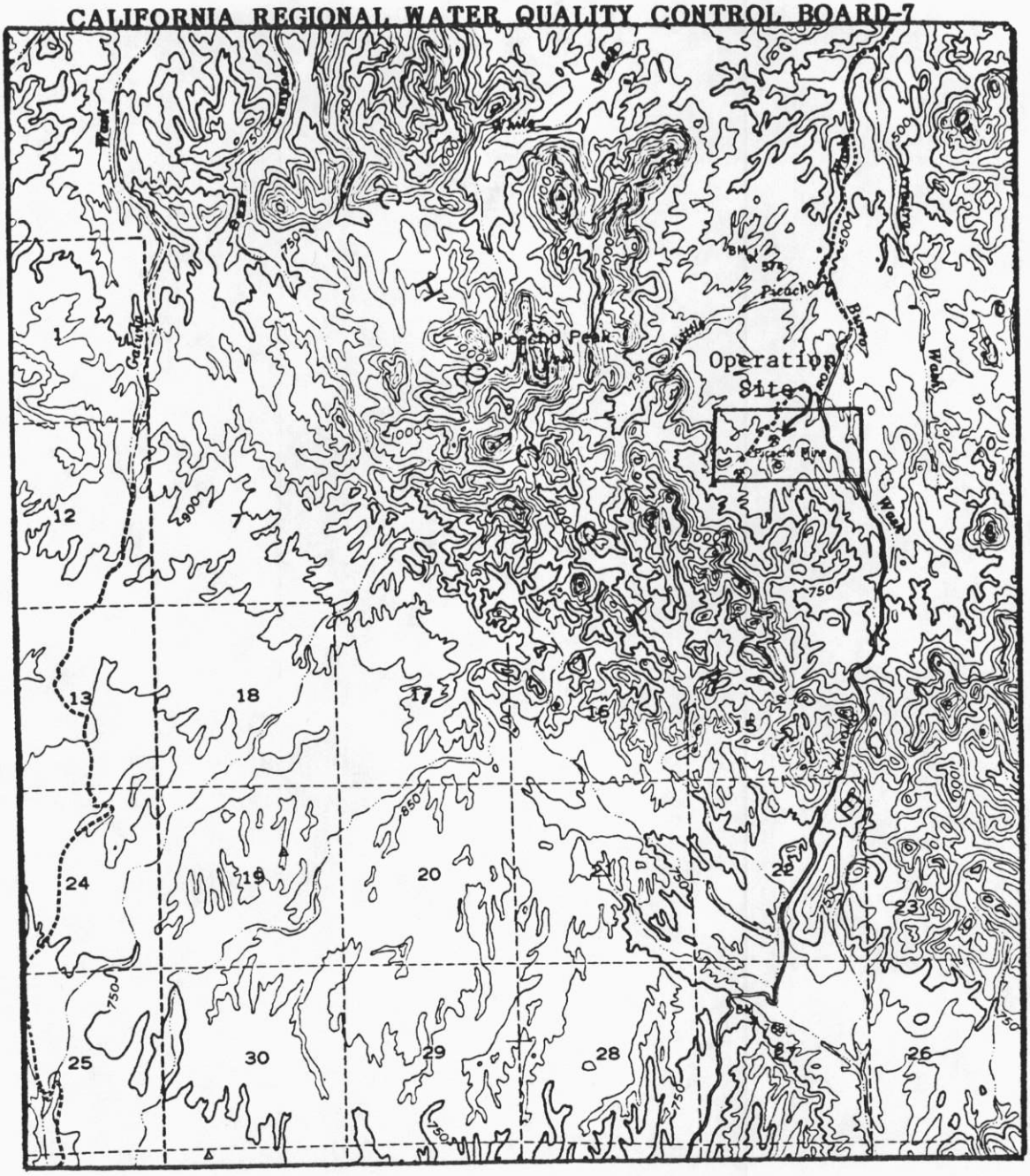
SITE MAP NO. 1
PICACHO PEAK MINE - SITE NO. 1
CHEMGOLD, INC.
North of Yuma - Imperial County

Order No. 87-76

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD-7



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SITE MAP NO. 2
PICACHO PEAK MINE - SITE NO. 1
CHEMGOLD, INC.
North of Yuma - Imperial County
Location: 1 mile north and ½ mile east of
NE corner of Section 16, T14S, R22E, SBB&M
USGS Picacho Peak 15 min. Topographic Map

Order No. 87-76