CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 92-009

WASTE DISCHARGE REQUIREMENTS
FOR
CHEMGOLD, INC.
PICACHO PEAK MINE - SITE NO. 5
North of Yuma - Imperial County

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

1. Chemgold, Inc., the owner/operator, (hereinafter also referred to as the discharger), 1891 Rail Avenue, P.O. Box 2015, Yuma, Arizona 85366-2015, proposes to expand existing operations at the Picacho Gold Mine. The Dulcina Pit Phase 2 expansion project (Site 5) will include an increase in allowable tonnage of ore to be mined, construction of a new heap leach pad and supporting facilities with process ponds, and expansion of a waste stock pile. Existing operations are currently regulated under Board Order No. 90-057 (Site 3) and Board Order No. 90-035 (Site 4).

2. A Report of Waste Discharge (ROWD) was submitted September 30, 1991. At the request of Regional Board staff, the ROWD was revised and re-submitted October 11, 1991. On November 18, 1991, amended pad design data was submitted along with documentation required under Article 5, Chapter 15, Title 23, California Code of Regulations, thus completing the Report of Waste Discharge.

3. The discharger proposes to construct and operate a cyanide heap leach operation on patented land adjacent to the existing Site 3 and located on a portion of unsurveyed Sections 2, 3, 4, 9, 10, and 11, T14S, R22E, SBB&M; Assessors Parcel Number: 042-222-02-01. The proposed leach pad will cover approximately 38 acres with a capacity of 10 million tons of ore. Processing ponds with a combined capacity of 5.7 million gallons (not including freeboard) and a carbon absorption plant will be constructed.

4. Ore placement is expected at a rate of 1.5 to 2.0 million tons-per-year with an operating life for total recovery of 20 years. For pad and pond foundations, excavated rock material will be used as fill and be placed in 1.5 to 2-foot lifts. 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. Before commencing foundation work, wash areas beneath the pad will be filled with rubblized material.

5. The discharger states that areas of the pad overlying major washes will be double-lined with a 60 mil HDPE top liner and a minimum 30 mil HDPE bottom liner. The top liner will be covered by a minimum of 24-inch layer of 3/4 - inch nominal free draining gravel. A piping system will be placed within the gravel area to facilitate drainage. A leachate collection and recovery

system (LCRS) will be installed between the liners consisting of free-draining gravel and a perforated pipe to permit early detection of solution loss. This vadose zone monitoring system will be divided into separate zones to facilitate detection and location of potential leakage. For non-wash areas, a single 60 mil HDPE liner will be installed as described above, covered with a minimum of 24 inches of gravel and embedded with perforated pipe.

An additional leakage detection system will be installed beneath the single lined portion of the pad and down-gradient of leaching. This system will consist of a 60 mil HDPE lined 200 foot long trench with a 4 inch collection pipe to detect leakage and direct flow to a lined sump for monitoring and return of solution to the process system. Additionally, pressure/vacuum lysimeters will be installed below the liner on the non-groundwater portion of the leach pad.

6. The discharger states that monitoring wells, process pond sumps, and a leach pad leakage detection system will be constructed to detect leakage of solution. A total of 7 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 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.

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 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, Chapter 15, 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 was adopted May 15, 1991 and 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. Pursuant to the completed application, site plans and Final Supplemental Environmental Impact Report, State Clearinghouse No. 8106203 on file, a Conditional Use Permit No. 990-91 was issued by Imperial County Planning Department on October 23, 1991, for this project thus fulfilling the CEQA requirements.

14. The discharger certifies that ground water beneath Site 5 is very minimal and occurs only in major wash areas. Hydrogeologic studies submitted to the Regional Board (Condor Earth Technologies October 1989 and April 1990) indicate an absence of a regional ground water aquifer beneath the site. Exploration drilling to a depth of 200 feet beneath Site 5 failed to encounter ground water. Baseline monitoring wells show that ground water occurrence in the wash areas is limited, sporadic, and non-continuous.

15. To protect existing ground water, the discharger states that the heap leach pad will be constructed as follows:

    1) Non-ground water areas of the leach pad will be single-lined with 60 mil HDPE liner and will contain a monitoring system beneath the liner.

    2) Portions of the leach pad overlying wash areas will be double-lined with a 60 mil HDPE top liner and a minimum 30 mil HDPE bottom liner with a LCRS between the liners.

16. Pursuant to Title 23, California Code of Regulations, Chapter 15, Section 2570; Mining Waste Management Units which received waste discharge requirements after the effective date of this Chapter shall comply with the siting and construction standards in this article. Requirements for new and existing mining waste management units are summarized on Table 7.1. The Regional Board may impose more stringent requirements to accommodate regional and site specific conditions.

17. The discharger has submitted on November 5, 1991 a proposed financial assurance in the amount of $98,640 for the Executive Officers consideration

18. Water Quality Protection Standard:

As required by Title 23, California Code of Regulations, Chapter 15, Article 5, Section 2550.2, of the Water Quality Protection Standard consists of the following:

a) Constituents of Concern - Article 5 Section 2550.3

The discharger states that the constituents of concern for Site 5 will be free and total cyanide, turbidity, electrical conductivity, and pH.

b) Concentration Limits - Article 5 Section 2550.4

The discharger states that the monitoring parameter for leak detection at Site 5 will be free cyanide. Presently background levels for cyanide are zero.

c) Point of Compliance - Article 5 Section 2550.5

The point of compliance will be the groundwater surface of the uppermost ground water encountered. In the wash areas baseline monitoring well BL-3 drilled to 320 feet had encountered ground water at 72 feet on December 12, 1990. The first or highest level of water available for sampling will be the point of compliance.

d) Monitoring Points - Article 5 Section 2550.5

The current monitoring points will consist of 7 monitoring wells around the perimeter of the heap leach pad, as well as pressure/vacuum lysimeters installed beneath the single-lined portion of the pad. An LCRS will be installed between the double lined portions of the pad overlying wash areas. A leakage detection lined trench system will be installed at the toe of the heap leach pad and down gradient of leaching.

e) Compliance Period - Article 5 Section 2550.6

The compliance period is assumed to be 25 years, allowing 5 years for closure and post-closure monitoring after the expected 20 year operating period.

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

A. Discharge 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 portions of the heap leach ore piles overlying major wash areas shall be double lined. The wash areas shall first be filled with rubblized material prior to pad construction. The top liner shall have a minimum

thickness of 60 mils, the bottom liner a minimum of 30 mils with a LCRS between the liners. The remainder of the pad will be single lined with 60 mil HDPE with a vadose zone monitoring system near the discharge point.

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. The headwaters of channelized wash areas above the heap leach pad shall be diverted around the pad and designed to withstand a probable 100 year storm.

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 60 mils. The upper liner shall be equivalent to a reinforced weather-resistant synthetic material with a minimum thickness of 60 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 60 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.

5. 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 (30-60 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.

6. 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.

7. All drainage and collection facilities used to contain or transport leaching solution shall be effectively sealed to prevent leakage of these liquids.

8. 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.

9. There shall be no discharge of process wastewater at any location without prior approval from the Executive Officer.

10. Adequate measures shall be taken to insure that liners remain intact throughout the duration of the leaching activity.

11. Prior to removal of leached ore residue from a lined pad, for disposal, the cyanide contained therein shall be neutralized as described in Discharge Provision No. 1, below.

12. Ore residue may be abandoned on a pad, provided the cyanide in the ore is neutralized as described in Discharge Provision No. 2 below, and all other necessary and applicable closure requirements are complied with.

13. All industrial waste materials not covered by said Article 7, Chapter 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.

B. Prohibitions

1. 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.

C. Discharge Provisions

1. 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 Provision.

2. 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.

3. The discharger shall maintain a ground water monitoring well network and a vadose zone monitoring system as approved by the Executive Officer.

4. At least 60 days[1] 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.

5. 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.

6. 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.

7. 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

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

and tailings disposal site upon abandonment of facilities, in a manner that will not adversely affect water quality.

8. 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.

9. 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 January 22, 1992.

Philip A. Gruenberg
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 92-009
FOR
CHEMGOLD, INC.
PICACHO PEAK MINE - SITE NO.5
North of Yuma - Imperial County

Location of Discharge: Section 2, 3, 4, 9, 10, 11 T14S, 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.

F. Measurement of hydraulic head over the liner beneath the ore pile from representative locations.

G. Data collected from the monitoring well network and vadose zone systems as described in Provision 3.

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 Provision No. 1, 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. 92-009.

REPORTING

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

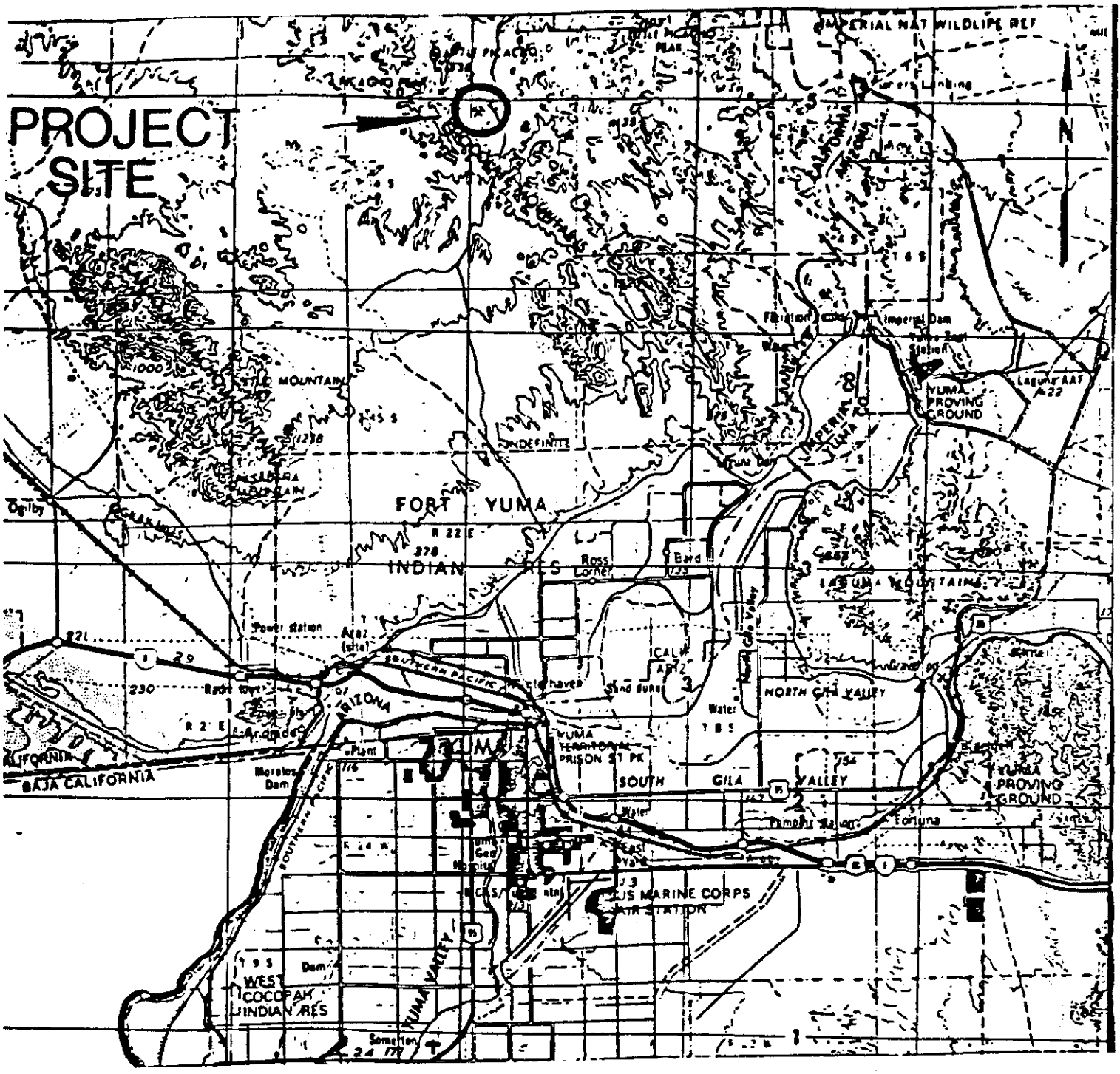
Forward monitoring reports to:

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

ORDERED BY: Philip A Gruenberg
Executive Officer

January 22, 1992
Date

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - 7



SITE MAP

CHEMGOLD, INC.
PICACHO PEAK MINE - SITE NO. 5
North of Yuma - Imperial County
Section 2, 3, 4, 9, 10, 11 T14S, R22E, SBB&M

Board Order No. 92-009