

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 81-16

WASTE DISCHARGE REQUIREMENTS
FOR
OCCIDENTAL GEOTHERMAL, INC.
East of Brawley - Imperial County

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

1. Occidental Geothermal, Inc. (hereinafter also referred to as the discharger), 5000 Stockdale Hwy., Bakersfield, CA 93309, submitted a Report of Waste Discharge, dated November 26, 1980.
2. The discharger proposes to drill two exploratory geothermal wells in the Brawley area at the following sites:

Emanuelli A

S 1/2 of the NW 1/4 of Section
20, T13S, R16E, SBB&M

Rutherford C

NW 1/4 of the SW 1/4 of Section 19,
T13S, R16E, SBB&M

3. An impermeable mud sump, 100 feet by 50 feet by 10 feet deep with an approximate capacity of 340,000 gallons, and a impermeable flow test containment basin, 270 feet by 270 feet by 10 feet deep with an approximate capacity of five million gallons would be constructed at each site. Each site would utilize about 3.0 acres of surface area.
4. The discharger proposes to discharge into each mud sump a maximum of 337,000 gallons of drilling mud and drilling cuttings. Following some evaporation, the residual mud would be removed from the sumps and discharged at a solid waste disposal site approved by the Regional Board to receive this waste.
5. The drilling mud components which may be used are:

Bentonite	Bicarbonate of Soda	Sodium Polyacrylate
Lignite	Sepiolite	Drilling Detergent
Caustic Soda	Soda Phosphate	Water
Barium Sulfate	Soda Ash	

*Cancelled
9/22/88*

6. The discharger proposes to discharge approximately 370,000 gallons of cleanout fluid into steel tanks, and about 5 million gallons of flow test fluid into the flow test containment basins. Final disposal would be by subsurface reinjection, or after some evaporation the residual fluids would be discharged at a Class I or Class II-1 solid waste disposal site approved by the Regional Board to receive this waste.
7. Geothermal brines in portions of Imperial County are known to contain certain constituents which are classified as hazardous by the Department of Health Services, Hazardous Materials Management Section. Said hazardous wastes must be discharged at approved Class I or Class II-1 disposal sites.
8. The Water Quality Control Plan for the West Colorado River Basin Region was adopted on April 10, 1975. The Basin Plan contains water quality objectives for Imperial Hydrologic Unit.
9. Beneficial uses to be protected by this Order are as follows:
 - a. Groundwater
 1. Shallow groundwaters at the discharge location are saline and are not beneficially used.
 2. Deep groundwaters are saline and are being investigated for geothermal development.
 - b. New and Alamo Rivers and Imperial Valley Irrigation Drains
 1. Transport of dissolved solids to Salton Sea for agricultural soil salinity control.
 2. Freshwater replenishment for Salton Sea.
 3. Freshwater habitat for fish and wildlife.
 4. Recreation - nonwater contact.
10. Imperial County Planning Department certified on December 10, 1980 Mitigated Negative Declaration SCH 80101702 for these wells. The Regional Board has reviewed this Negative Declaration. The below waste discharge requirements are designed to assure against any significant adverse effects on water quality.
11. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the proposed discharge.
12. The Board in a public meeting heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, Occidental Geothermal, Inc., shall comply with the following:

A. Discharge Specifications

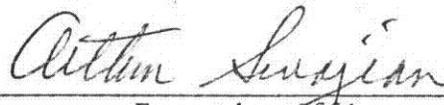
1. Neither the treatment nor the discharge of wastes shall create a pollution or a nuisance as defined in Division 7 of the California Water Code.
2. Geothermal fluids and other wastes shall not enter any rivers, canals, drainage channels, or drains (including subsurface drainage systems) which could provide flow or seepage to Salton Sea.
3. Temporary discharge and/or storage of drilling mud, drill cuttings, cleanout fluid and flow test fluid other than into mud sumps, steel containers or flow test containment basins from which there is no seepage or overflow, is prohibited.
4. The sumps, containers and basins shall be constructed so that the fluids contained within shall not penetrate through the lining during the containment period. These facilities shall be used for temporary storage only.
5. Adequate protective works and maintenance shall be provided to assure that the facilities will not become eroded or otherwise damaged during the project period, and/or until all well drilling, well cleanout, and flow test materials are removed.
6. A minimum freeboard of at least two (2) feet shall be maintained in the flow test containment basins and one (1) foot in the mud sumps and steel tanks.
7. Containment basins for drilling mud, drill cuttings and cleanout fluid shall be constructed to have a permeability not greater than 1×10^{-6} cm/sec.
8. Flow test containment basins shall be constructed to have a permeability not greater than 1×10^{-8} cm/sec.
9. The volume of fluids stored at each site shall not exceed 652,000 gallons (2 acre feet) for more than one year.
10. Fluids discharged by subsurface injection shall not be discharged into any subsurface zone which has a total dissolved solids concentration of less than 10,000 mg/l, unless the quality of the injection water is comparable to that of the receiving water.

11. Saline drilling muds, with extractable water containing a total dissolved solids concentration exceeding 6,000 mg/l, and brine and salt wastes, shall be discharged at a Class I or Class II-1 disposal site approved by the Regional Board to receive said waste.
12. Non-saline drilling muds, with extractable water containing a total dissolved solids concentration which is less than 6,000 mg/l, and not containing hazardous wastes* may be disposed at a Class II-2 disposal site approved by the Regional Board to receive said wastes.
13. Final disposal of residual wastes in accordance with Specifications No. 9, 10, and 11 above, and cleanup of all contents, shall be accomplished upon abandonment of operations. Lack of construction or operational activity on the site for a period of one year shall constitute abandonment for the purposes of this Order.

B. Provisions

1. The discharger shall comply with "Monitoring and Reporting Program No. 81-16" and "General Provisions for Monitoring and Reporting", and future revisions thereto, as specified by the Executive Officer.
2. At least 5 days prior to the discharge of any materials, the discharger shall submit to the Regional Board a technical report showing the construction of the sump and basin, and a certificate signed by a California Registered Civil Engineer stating that the sumps, basins and attendant facilities are constructed to meet the requirements of this Order.

I, Arthur Swajian, Executive Officer, do hereby certify that 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 28, 1981.



Executive Officer

* SEE ATTACHMENT A

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ATTACHMENT A

Threshold Limit Concentrations for Persistent
and Bioaccumulative Toxic Substances

Drilling mud, cuttings, and other geothermal wastes containing the following substances having concentrations equal to or greater than those listed below are designated as hazardous by the State of California Department of Health Services.

	<u>Soluble Threshold Limit mg/kg</u>	<u>Total Threshold Limit net weight mg/kg</u>
1. Arsenic and compounds	5	50
2. Barium (excluding barite) and compounds	100	1,000
3. Lead compounds, inorganic	5	50
4. Lead compounds, organic	—	13
5. Manganese compounds	100	1,000
6. Zinc compounds	17	170

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 81-16
FOR

OCCIDENTAL GEOTHERMAL, INC.
East of Brawley - Imperial County

Location: Section 20, T13S, R16E, SBB&M, and Section 19, T13S
R16E, SBB&M.

MONITORING

Occidental Geothermal, Inc. shall report monitoring data to the
Regional Board in accordance with the following schedule:

<u>Constituents</u>	<u>Units</u>	<u>Reporting Frequency</u>
1. Volume of geothermal wastes discharged to each sump and basin	Gallons	Monthly
2. Volume contained in each sump and basin	Gallons	Monthly
3. Total dissolved solids content of waste fluid contained in each sump and basin	mg/l	Monthly
4. Volume reinjected to subsurface strata	Gallons	Monthly
5. Total dissolved solids concentration of waste fluid injected into each injection well	mg/l	Monthly
6. Total dissolved solids concentration of groundwater contained in strata receiving waste fluid injection	mg/l	At least 10 days prior to commencement of injection
7. Location and depth of each injection well		At least 10 days prior to commencement of injection

<u>Constituents</u>	<u>Units</u>	<u>Reporting Frequency</u>
8. Calibrated electrical conductivity of flow from tile drain system underlying the area of each sump and basin	micromhos/cm	Daily*, Monday through Friday
9. Representative samples of drilling mud, cuttings and geothermal fluid to be proposed discharged at a Class II-2 solid waste disposal sites shall be analyzed for the following constituents and the results reported to the Regional Board.		5 days prior to discharge
a. Arsenic and compounds	mg/kg	
b. Barium (excluding barite) and compounds	mg/kg	
c. Lead compounds, inorganic	mg/kg	
d. Lead compounds, organic	mg/kg	
e. Manganese compounds	mg/kg	
f. Zinc compounds	mg/kg	
10. At least 5 days prior to the discharge of any drilling mud or geothermal materials into a mud sump or other container, the discharger shall submit to the Regional Board a technical report on the construction of said container, and a certificate signed by a California Registered Civil Engineer stating that the container and attendant facilities are constructed to meet the requirements contained in Board Order No. 81-16.		
11. Within 10 days after the initial discharge of any geothermal fluids from a well, the discharger shall report said initial discharge to the Board.		
12. Immediate reporting of any accidental spillage or release of waste material, and plan for immediate measures being taken to correct same and to limit detrimental effects.		
13. Estimate of total amount (tons) of saline drilling muds and salt and brine waste hauled to Class I or Class II-1 solid waste disposal site - immediately upon completion of haul.		
14. Estimate of total amount (tons) of non-saline drilling muds hauled to a Class II-2 solid waste disposal site - upon completion of operations - reported in final monitoring report.		

*Tile drain monitoring shall commence one (1) week prior to the initial discharge geothermal fluids into each sump and basin, and shall continue until wastes are removed from each sump and basin.

15. Report of completion of removal of all geothermal wastes from the sumps and basins - reported within one week following completion of work.
16. At least 10 days prior to destruction of any sump or basin, the discharger shall request a Regional Board staff inspection and approval of the cleanup procedure.

REPORTING

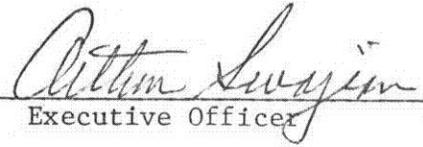
The above monitoring program shall be implemented immediately upon commencement of discharge at each site.

Monthly reports shall be submitted to the Regional Board by the 15th day of the following month. Reports for Item 10 (above) shall be forwarded immediately, and if at all possible, shall be preceded by phone communication to the Regional Board's office (714) 346-7491. Copies of the reports submitted to the Board pursuant to this Monitoring and Reporting Program shall be maintained at the operations site, and shall also be made available to staff of the Regional Board upon request.

Mail reports to:

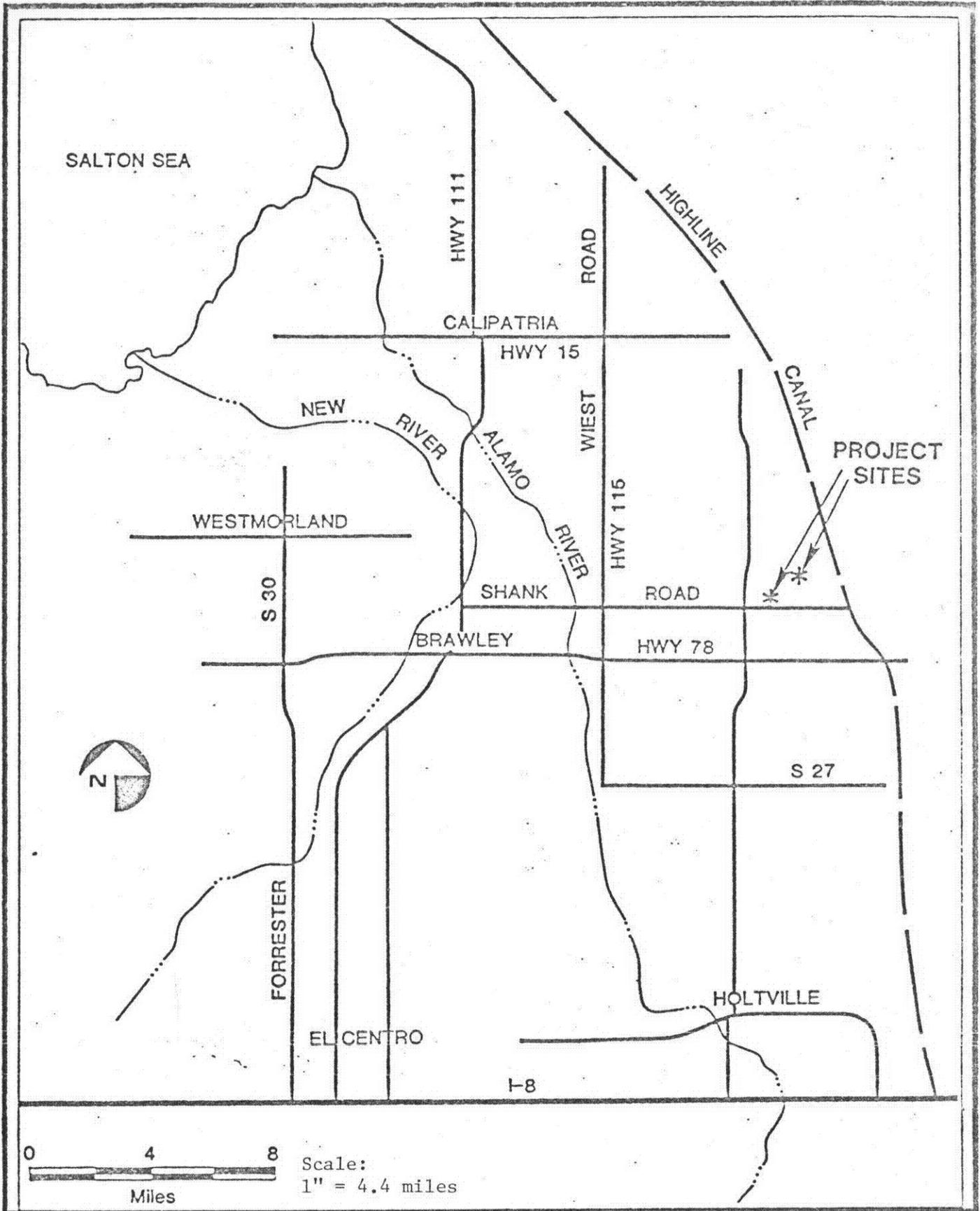
California Regional Water Quality Control Board
Colorado River Basin Region
73-271 Highway 111, Suite 21
Palm Desert, CA 92260

ORDERED BY:


Executive Officer

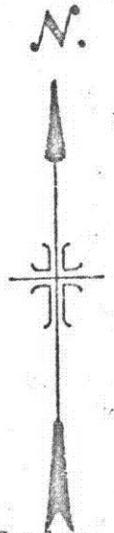
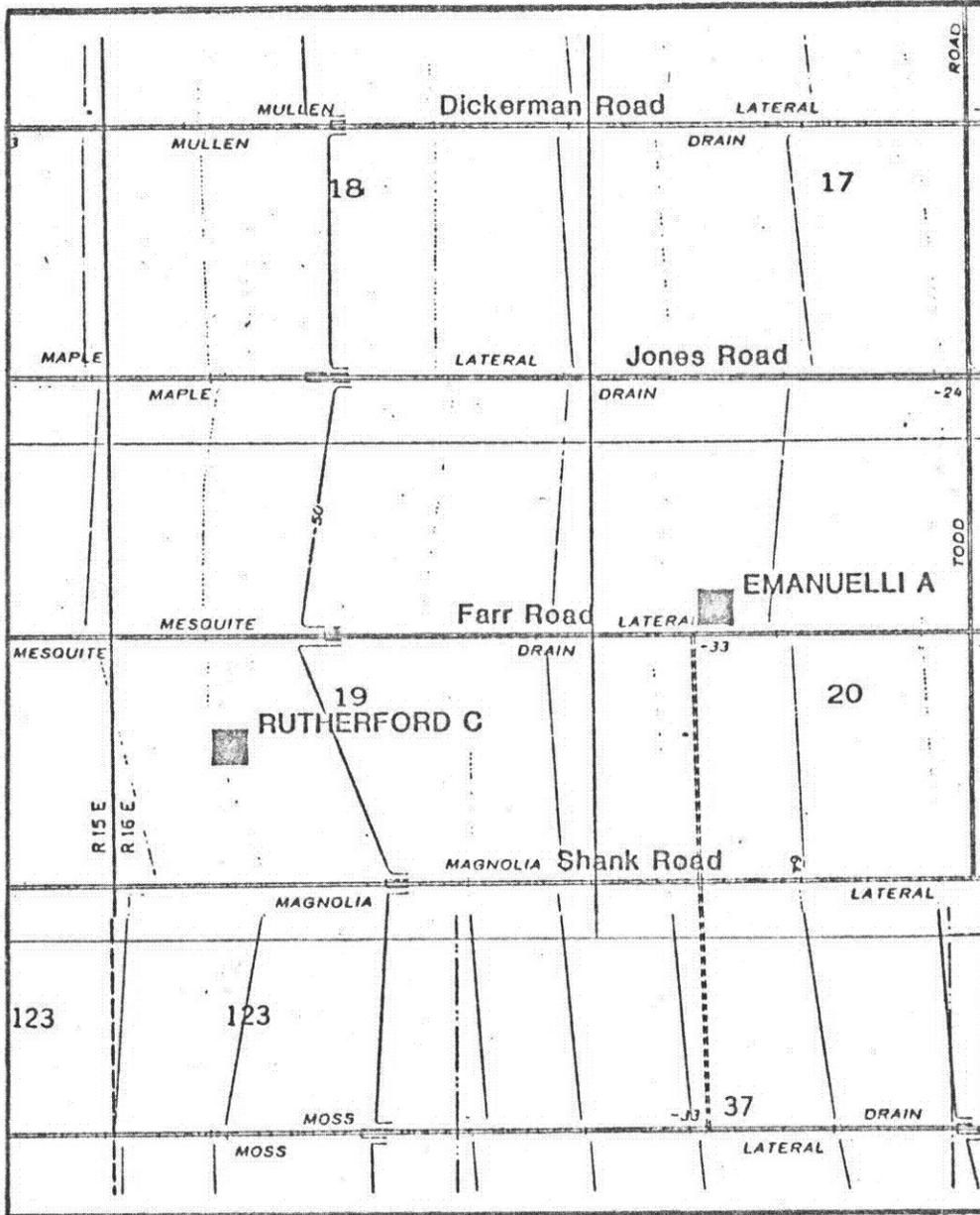
January 28, 1981

Date



SITE MAP NO. 1
OCCIDENTAL GEOTHERMAL, INC.
East of Brawley - Imperial County

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - 7



Scale:
1" = 2,000'

SITE MAP NO. 2
OCCIDENTAL GEOTHERMAL INC.
East of Brawley - Imperial County
S 1/2 of the NW 1/4 of Section 20, and the NW 1/4
of the SW 1/4 of Section 19, T13S, R16E, SBB&M
USGS Amos 7.5 min. Topographic Map

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