

Bicarbonate of Soda	(Cottonseed hulls, fibers,
Sodium Phosphate	mica flakes, cellophane)
Soda Ash (sodium carbonate)	Cement

Bentonite, Lignite, and Sepiolite are the main components; the other substances are additives and may or may not be used depending on the particular drilling conditions.

* Sepiolite - A clay-based mud, mined near Latrop Wells, NV.

7. The discharger is hereby informed that there are no solid waste disposal sites in the Colorado River Basin Region at this time that have been approved by the Regional Board to receive geothermal salt and brine wastes.
8. The Water Quality Control Plan for the West Colorado River Basin Region was adopted on April 10, 1975. This Order implements the objectives stated in said plan.
9. Beneficial uses to be protected by this Order are as follows:
 - a. Surface water in the area of the discharge originates from subsurface seepage and the flow from hot mineralized wells, has a TDS range of from 1,500 mg/l to 5,000 mg/l, and supports thickly vegetated wildlife habitat along the stream channels.
 - b. Groundwater
 1. Shallow groundwaters are mixtures of irrigation canal seepage water and hot mineralized water, and have a TDS range of from 940 mg/l to 3,000 mg/l.
 2. Deep groundwaters are hot and mineralized with a TDS range from 3,000 mg/l to 5,000 mg/l.
10. The State Lands Commission has prepared an Environmental Impact Report for these wells. Said report does not state that there will be any significant adverse effects upon the environment from well drilling.
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, McCulloch Geothermal Corporation shall comply with the following:

A. Discharge Specifications

1. Neither the treatment nor the discharge of wastes shall cause a pollution or a nuisance as defined in Division 7 of the California Water Code.

2. Geothermal fluids and other wastes shall not enter the Salton Sea or any canals, drainage channels, or drains (including subsurface drainage systems or aquifers) which could provide flow or seepage to Salton Sea.
3. Temporary discharge and/or storage of drilling mud, drilling cuttings and cleanout and flow test water other than into mud sumps from which there is no seepage or overflow, is prohibited.
4. Mud sumps shall be constructed so that the fluids contained within shall not penetrate through the lining during the containment period.
5. Adequate protective works and maintenance shall be provided to assure that mud sumps 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 mud sumps.
7. 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.
8. 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 Regional Board designated Class I or Class II-1 disposal site.
9. Drilling muds, with extractable water containing a total dissolved solids concentration which is less than 6,000 mg/l, and not containing hazardous wastes such as chromium, may be either disposed of at the site or disposed of at a Class II disposal site approved by the Regional Board to receive said wastes.
10. Final disposal of residual wastes in accordance with Specifications No. 7 and 8 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.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 78-75

WASTE DISCHARGE REQUIREMENTS
FOR
MC CULLOCH GEOTHERMAL CORPORATION
GEOTHERMAL WELLS
Near Frink Springs - Imperial County

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

1. McCulloch Geothermal Corporation (hereinafter also referred to as the discharger), 10880 Wilshire Blvd., Los Angeles, California 90024, submitted a Report of Waste Discharge dated June 2, 1978.
2. The discharger proposes to drill two geothermal wells at the following locations:

Hot Mineral No. 1 - NE $\frac{1}{4}$, NE $\frac{1}{4}$, Section 15, T9S, R12E, SBB&M.

Hot Mineral No. 2 - NW $\frac{1}{4}$, NW $\frac{1}{4}$, Section 15, T9S, R12E, SBB&M.
3. Drilling mud and drilling cuttings would be discharged to a 85' x 150' mud sump located near each well. The mud and cuttings will then be removed from the sump and discharged at a solid waste disposal site approved by the Regional Board to receive this waste.
4. Well cleanout water and flow test water would be discharged to the mud sump. After some evaporation of the liquid, the brine residue would be removed and discharged at a disposal site approved by the Regional Board to receive this waste.
5. Flow from production testing of geothermal wells would be injected subsurface.
6. The drilling mud components which may be used are:

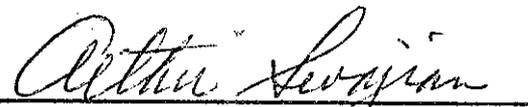
Magcogel (Bentonite)	Geo-Gel (Sepiolite)*
Tannathin (Lignite)	Cypan (Sodium Polyacrylate)
Caustic Soda (NaOH)	Drilling Detergent
Barite (Barium Sulfate)	Lost Circulation Materials

Rescinded
9-26-79

B. Provisions

1. The discharger shall comply with "Monitoring and Reporting Program No. 78-75" and "General Provisions for Monitoring and Reporting", and future revisions thereto, as specified by the Executive Officer.
2. Prior to the discharge of any materials into a mud sump, the discharger shall submit to the Regional Board a technical report showing the construction of said sump, and a certificate signed by a California Registered Civil Engineer stating that the sump 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 September 27, 1978.


Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 78-75
FOR

MC CULLOCH GEOTHERMAL CORPORATION
GEOTHERMAL WELLS
Near Frink Springs - Imperial County
Location: Section 15, T9S, R12E, SBB&M

MONITORING

Mc Culloch Geothermal Corporation 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 mud sump.	Gallons	Monthly
2. Volume contained in each mud sump.	Gallons	Monthly
3. Total dissolved solids content of waste fluid contained in each mud sump.	mg/l	Monthly
4. Volume directly reinjected to subsurface strata from each geothermal well.	Gallons	Monthly
5. Total dissolved solids concentration of waste fluid injected into each injection well.	mg/l	Monthly
6. Total dissolved solids concentration of ground-water 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

8. Within 10 days after the initial discharge of any geothermal fluids from a well, the discharger shall report said initial discharge to the Board.
9. 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.
10. 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.
11. Estimate of total amount (tons) of non-saline drilling muds hauled to a Class II solid waste disposal site - upon completion of operations - reported in final monitoring report.
12. Report of completion of removal of all geothermal wastes from mud sumps - reported within one week following completion of work.
13. At least 10 days prior to destruction of any mud sump, 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 9 (above) shall be forwarded immediately, and if at all possible shall be preceded by phone communication to the Regional Board's office (phone 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
73-721 Highway 111, Suite 21
Palm Desert, CA 92260

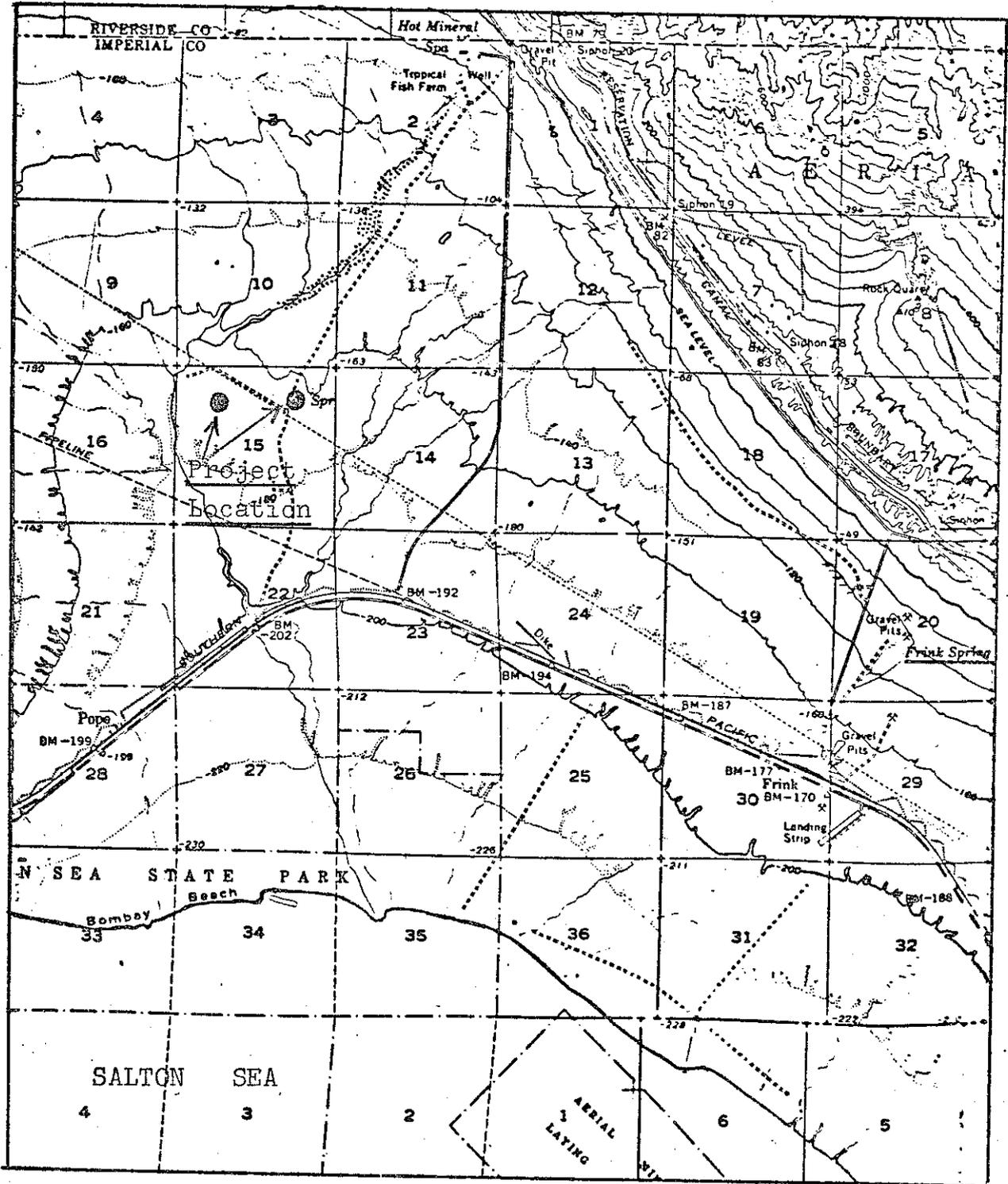
Ordered by

Arthur Levajin
Executive Officer

September 27, 1978

Date

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - 7



SITE MAP

Scale: 1" = 1 Mile

MC. CULLOCH GEOTHERMAL CORPORATION
GEOTHERMAL WELLS
Near Frink Springs - Imperial County
Section 15, T9S, T12E, SBB&M - Frink 15' Topographic Map

Order No. 78-75