

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 88-131

WASTE DISCHARGE REQUIREMENTS
FOR
UNOCAL CORPORATION
SALTON SEA UNIT III
GEOTHERMAL PRODUCTION FACILITIES
North of Westmorland - Imperial County

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

1. Unocal Corporation (hereinafter referred to as the discharger), P. O. Box 1805, Indio, CA 92202, submitted a Report of Waste Discharge dated August 8, 1988.
2. The discharger proposes to build and operate a 49 megawatt geothermal power plant (Unit III) and associated well field development in the Salton Sea Known Geothermal Resource Area (KGRA). The Unit III power plant is under construction near the center of Section 5, T12S, R13E, SBB&M.
3. The discharger proposes to use five wells for production and injection of geothermal fluids to supply the power plant. Said wells will be located in Section 5, T12S, R13E, SBB&M at the following sites:

<u>Well</u>	<u>Location</u>	<u>Type</u>
Vonderahe-1	SW 1/4, NE 1/4	Production
Sinclair-10	SW 1/4, NE 1/4	Production
Sinclair-21	SW 1/4, SE 1/4	Injection
Sinclair-22	SW 1/4, SE 1/4	Injection
Sinclair-23	SW 1/4, SE 1/4	Injection

4. The discharger proposes to drill up to thirteen additional wells to be used to supply geothermal fluid to Unit III to insure that adequate amounts of fluid are available during the active life of the power plant. These wells would be drilled as needed from well pads to be constructed at the following potential locations in T12S, R13E, SBB&M:

<u>Well Pad</u>	<u>Location</u>
5A	NE 1/4, NW 1/4, Section 5
5B	NE 1/4, NE 1/4, Section 5
5C	SE 1/4, NE 1/4, Section 5
5D	SE 1/4, NE 1/4, Section 5
5E	NW 1/4, SW 1/4, Section 5

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to Salton Sea B.P. LP.
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Well PadLocation

5F	NE 1/4, SW 1/4, Section 5
5G	NE 1/4, SE 1/4, Section 5
5H	SE 1/4, SW 1/4, Section 5
5I	SE 1/4, SE 1/4, Section 5
4A	NE 1/4, NW 1/4, Section 4
4B	SE 1/4, NW 1/4, Section 4
4C	NW 1/4, SE 1/4, Section 4
4D	SW 1/4, SE 1/4, Section 4
4E	SW 1/4, SW 1/4, Section 4
8A	SW 1/4, NW 1/4, Section 8
8B	SE 1/4, NW 1/4, Section 8
8C	SE 1/4, NE 1/4, Section 8
8D	SW 1/4, SW 1/4, Section 8
8E	SE 1/4, SW 1/4, Section 8
8F	SE 1/4, SE 1/4, Section 8

5. The discharger also currently operates the Salton Sea Unit I power plant and its associated well field in the W 1/2, Section 5, T12S, R13E, SBB&M. The Unit I development has been subject to waste discharge requirements (Orders No. 78-56 and 81-40) adopted by the Regional Board on July 12, 1978 and March 25, 1981, respectively. These Orders are scheduled to be updated and combined into a single Order (No. 88-57). Two of the wells to be used for the Unit III project (Vonderahe-1 and Sinclair-21) have been drilled previously in accordance with Board Order No. 81-40. These two wells will be regulated by Board Order No. 88-131 upon adoption of this Order.
6. Temporary clay lined containment basins have been constructed at the well sites to contain the drilling mud, drill cuttings, and cleanout fluid produced during drilling. Additional temporary containment basins would be constructed at any newly drilled well sites.
7. Final disposal of geothermal wastes discharged to temporary containment basins would be by subsurface injection or by hauling said wastes to a waste management facility approved by the Regional Board to accept said wastes.
8. Geothermal fluids (brines) from production and flow tests would be injected subsurface.
9. Geothermal fluids in this portion of the Salton Sea KGRA contain approximately 25% (by weight) dissolvable solids. These fluids may be classified as hazardous in accordance with the criteria listed in Section 66699, Title 22 of the California Code of Regulations, based on concentrations of lead, zinc, and arsenic.

10. Precipitated minerals removed from the brine during operation of the power plant would be processed into a form of concrete (referred to by the discharger as "geocrete"). The "geocrete" is tested by the discharger to verify that it is non-hazardous and non-toxic and is then used by the discharger for on-site construction purposes.
11. The discharger proposes to construct a concrete-lined brine pond at the power plant to contain fluids prior to their injection subsurface. Fluids contained in said brine pond would include steam condensate from the power plant, cooling tower blowdown, brine diverted from the power plant during emergency conditions, and fluids produced from geothermal salt dissolving processes or rinsing of other geothermal wastes. Fluid from said brine pond would be injected subsurface through an approved well.
12. The Water Quality Control Plan for the Colorado River Basin Region of California was adopted by the Regional Board on November 14, 1984.
13. Beneficial uses to be protected by this Order are as follows:
 - a. Ground water
 1. Shallow ground waters at the discharge location are saline and are not beneficially used.
 2. Deep ground waters are brine 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.
14. An Environmental Impact Report (SCH #80102409) describing geothermal developments in this area was adopted by the Imperial County Planning Department in 1980. A Negative Declaration was approved for this project by the Imperial County Planning Commission on October 7, 1986. Regional Board staff has reviewed these documents and finds that this project should not have significant impact on water quality if conducted according to requirements and provisions of this Order.
15. Geothermal projects are also regulated by the California Division of Oil and Gas. The Regional Board and the local District of the Division of Oil and Gas (located in El Centro) have worked together to review this project in accordance with the Memorandum of Agreement between the State Water Resources Control Board and the Division of Oil and Gas as originally approved in August 1982, with subsequent amendments approved on May 19, 1988.

16. The Board has notified the discharger and interested agencies and persons of its intent to issue waste discharge requirements for the discharge.
17. The Board in a public meeting heard and considered all comments pertaining to the proposed discharge.

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

A. Discharge Specifications and Prohibitions

1. Neither the treatment nor the discharge of wastewater shall create pollution or nuisance as defined in Division 7 of the California Water Code.
2. Geothermal drilling mud, drill cuttings, and cleanout fluid shall be discharged for temporary storage into either:
 - a. Earthen basins with a minimum six (6) inch compacted clay lining having a coefficient of permeability of 1×10^{-7} cm/sec or less. Clay lining shall be defined as: at least 40 percent of the material, by weight, passing a No. 200 U. S. Standard Sieve;
 - b. Earthen basins lined with a synthetic liner of not less than 40 mil thickness, approved by the Executive Officer; or
 - c. Metal or other type containers approved by the Executive Officer.

All such basins or containers shall be protected and maintained to ensure their effectiveness.

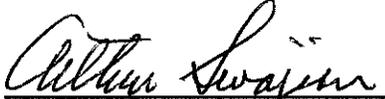
3. Permanent (longer than one (1) year) disposal or storage of geothermal waste in on-site temporary containment basins is prohibited.
4. Liquid wastes stored in temporary containment basins shall be injected subsurface or disposed at an appropriate waste management facility approved by the Regional Board. Solid wastes shall be disposed at an appropriate waste management facility approved by the Regional Board.
5. Storage of fluids described in Finding No. 11 above, other than into containment basins having a liner permeability of 1×10^{-8} cm/sec, or less, is prohibited, and the fluids contained therein shall not penetrate through the lining during the containment period.
6. A minimum freeboard of two feet shall be maintained in all containment basins at all times.

7. Adequate protective works and maintenance shall be provided to assure that containment basins shall not become eroded or otherwise damaged by floods occurring during the project life of said basins.
8. Geothermal fluids and other wastes shall not enter any canals, natural or man-made drainage channels, or drains (including subsurface drainage systems) except as allowed under an appropriate National Pollutant Discharge Elimination System (NPDES) Permit.
9. Fluids discharged by subsurface injection shall not be injected into any subsurface aquifer which has a TDS concentration of less than 10,000 mg/l, unless the TDS concentration of the injection water is less than or equal to that of the receiving water, or, as an alternative, the discharger demonstrates to the satisfaction of the Executive Officer that injection into said zone will not pose a threat to water quality.
10. Any fluids discharged by subsurface injection at depths less than 1000 feet below ground surface shall have written approval of the Executive Officer prior to subsurface injection.
11. Geocrete may be used for on-site construction or maintenance only if all the following conditions are met:
 - a. Geocrete shall not exceed the Soluble Threshold Limit Concentration (STLC) or the Total Threshold Limit Concentration (TTLC) values in accordance with Section 66699, Title 22 of the California Code of Regulations, and any future revisions, thereto.
 - b. Leachate produced from representative samples of geocrete shall be tested using a bioassay procedure approved by the Executive Officer. Results of the bioassays shall demonstrate to the satisfaction of the Executive Officer that the produced leachate does not contain substances in concentrations toxic to human, animal, plant or aquatic life.
 - c. Use of geocrete shall not cause a violation of any applicable water quality standards for receiving waters adopted by the Regional Board or the State Water Resources Control Board as required by the Clean Water Act and regulations adopted thereunder.
12. Final disposal of residual wastes and cleanup of containment facilities shall be accomplished upon abandonment or closure of operations to the satisfaction of the Executive Officer. Lack of construction or operational activity on 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. 88-131", and future revisions thereto, as specified by the Executive Officer.
2. The discharger shall submit to the Board, at least 30 days prior to commencement of operation at each new well, a written report on the proposed method and estimated costs of cleanup and closure in accordance with the requirements of this Order.
3. At least ten days prior to the discharge of any material into a containment basin, the discharger shall submit to the Regional Board a report signed by a California Registered Civil Engineer or Certified Engineering Geologist advising the Executive Officer that the containment basin and attendant facilities are constructed to meet the requirements of this Order.
4. The discharger shall submit to the Board, at least 30 days prior to discharge to any constructed facilities, written adequate assurance that money is committed in the amount of \$150,000.00 to ensure that all facilities are cleaned up and closed in accordance with the requirements of this Board Order (No. 88-131).
5. The discharger shall submit to the Regional Board a proposal to monitor the uppermost aquifer beneath the containment basin, described in Finding No. 11 above, during the project life of said basin. Said proposal shall be submitted within 60 days of the adoption of this Order, and shall be implemented after receiving the approval of the Executive Officer. Said basin shall be used for waste fluid containment only after said monitoring program has been implemented to the satisfaction of the Executive Officer.
6. In the event of any change in operation, or in control or ownership of land or waste disposal facilities owned or controlled by the discharger, the discharger shall:
 - a. Notify this Board of such change; and
 - b. Transmit a copy of this Order to the succeeding owner or operator, and file a copy of the transmittal letter with this Board.

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 November 30, 1988.


Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 88-131
FOR
UNOCAL CORPORATION
SALTON SEA UNIT III
GEOTHERMAL PRODUCTION FACILITIES
North of Westmorland - Imperial County

Location of Discharge: Sections 4, 5, and 8, T12S, R13E, SBB&M

MONITORING

Unocal Corporation shall report monitoring data to the Regional Board in accordance with the following schedule:

1. At least 30 days prior to commencement of operation at each new well, a written report on the proposed method and estimated costs of cleanup and closure in accordance with the requirements of Board Order No. 88-131.
2. At least ten days prior to the discharge of any material into a containment basin, submit a report signed by a California Registered Civil Engineer or Certified Engineering Geologist advising that the containment basin and attendant facilities are constructed to meet the requirements of Board Order No. 88-131.
3. Submit the following information:

<u>Constituents</u>	<u>Unit</u>	<u>Reporting Frequency</u>
a. Volume of discharge contained in each temporary containment basin and brine holding basin.	Gallons	Monthly
b. Volume of geothermal waste discharged at waste management facility, and name of facility.	Gallons	Monthly
c. Total dissolved solids concentration and volume of geothermal fluid injected into each injection well.	mg/l and Gallons	Monthly

<u>Constituents</u>	<u>Unit</u>	<u>Reporting Frequency</u>
d. TTLC and STLC values for Geocrete (inorganics only).	mg/l	Monthly
e. Volumes and locations of use of Geocrete	cubic feet	Monthly
f. Bioassay results from Geocrete leachate test.	-	Quarterly
g. Total dissolved solids concentration of ground water contained in strata proposed to receive geothermal fluid injection.	mg/l	At least ten days prior to commencement of injection

4. Comply with the monitoring and reporting requirements of the approved ground monitoring proposal per Provision 5 of Board Order No. 88-131.
5. Immediate reporting of any accidental spillage or release of waste material and immediate measures being taken to correct same and to limit detrimental effects.
6. Report of completion of removal of all geothermal waste from temporary containment basins within one (1) week following completion of work.
7. At least ten days prior to destruction of each temporary containment basin, submit a request for inspection and approval of the cleanup procedures.

REPORTING

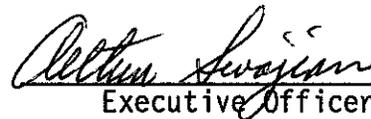
The above monitoring program shall be implemented immediately upon commencement of discharge at each site.

Monthly reports shall be submitted to the Regional Board by the 15th day of the following month. Quarterly reports shall be submitted to the Regional Board by January 15, April 15, July 15, and October 15 of each year. Reports for Item 5 (above) shall be forwarded immediately and shall be preceded by phone communication to the Regional Board's office, phone number 619-346-7491. 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:

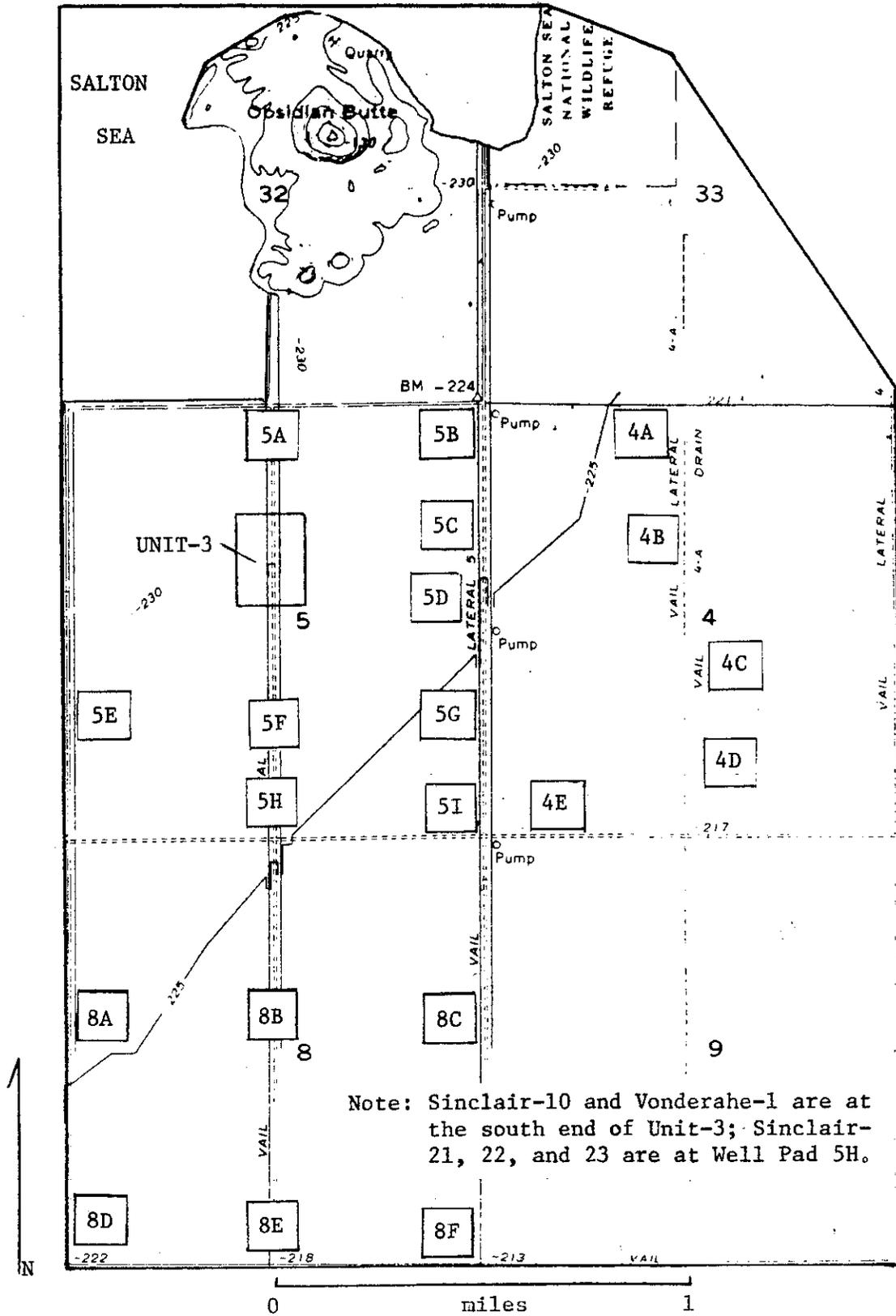
California Regional Water Quality Control Board
Colorado River Basin Region
73-271 Highway 111, Suite 21
Palm Desert, CA 92260

Ordered By:


Executive Officer

November 30, 1988

Date



Note: Sinclair-10 and Vonderahe-1 are at the south end of Unit-3; Sinclair-21, 22, and 23 are at Well Pad 5H.

UNOCAL GEOTHERMAL
 SALTON SEA UNIT III
 GEOTHERMAL PRODUCTION FACILITIES
 North of Westmorland - Imperial County

Section 4, 5, and 8, T12S, R13E, SBB&M
 USGS Obsidian Butte and Niland 7.5 min. Topographic Maps