CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 89-065

WASTE DISCHARGE REQUIREMENTS
FOR
EAST MESA PARTNERS
AND
ORMESA GEOTHERMAL II
ORMESA GEOTHERMAL II PROJECT
GEOTHERMAL PRODUCTION FACILITIES
EAST MESA KNOWN GEOTHERMAL RESOURCE AREA (KGRA)
East of El Centro - Imperial County

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

1. East Mesa Partners and Ormesa Geothermal II (hereinafter referred to as the discharger), 610 East Glendale Avenue, Sparks, Nevada 89431, submitted a Report of Waste Discharge dated June 9, 1989. The Report of Waste Discharge was received in the Regional Board's office and deemed complete on June 22, 1989.

2. The discharger is currently operating a 19.95 MW (gross) geothermal power plant (Ormesa II) and associated wellfield development in the East Mesa Known Geothermal Resource Area (KGRA) under Board Order No. 87-034. The Ormesa II project is located on a portion of Federal Geothermal Lease No. CA-6218, which includes Section 1, T16S, R16E, SBB&M, and Sections 4, 5, and 6, T16S, R17E, SBB&M, Imperial County, California.

3. The existing wells used by the discharger consist of 11 geothermal wells: 7 geothermal production wells and 4 geothermal injection wells, and 2 shallow ground water wells.

Well	Location	Type
21-6	NW¼, NW¼, Section 6	Production
33-6	SE¼, NW¼, Section 6	Production
84-1	SE¼, NE¼, Section 1	Production
45-6	NE¼, SW¼, Section 6	Production
14-5	SW¼, NW¼, Section 5	Production
36-5	NE¼, SW¼, Section 5	Production
18-5	SW¼, SW¼, Section 5	Production
32-5	NE¼, NW¼, Section 5	Injection
58-5	SW¼, SE¼, Section 5	Injection
62-6	NW¼, NE¼, Section 6	Injection
71-1	NE¼, NE¼, Section 1	Injection

Additional injection and production wells may be drilled and developed as replacement or makeup wells within Sections 1, 5, and 6, throughout the life of the project.

SUPERSEDED BY
BOARD ORDER NO. 00-095

4. The prior Board Order No. 87-34, Finding No. 5 stated that well locations could potentially be: Well No. 83-1 (Section 1, T16S, R16E, SBB&M) and Wells No. 31-6, 33-6, 66-6, 72-6, 14-5, 18-5, 31-5, 61-5, 64-5, 88-5 (Sections 5 and 6, T16S, R17E, SBB&M).

5. Geothermal fluids produced from the Ormesa II facility have had the following chemical composition:

Ormesa II Project Geothermal Fluid Chemistry
Geothermal Wells

Chemical Parameters (mg/l)	21-6	33-6	84-1	45-6	14-5	36-5	18-5
TDS	7018	8480	6812	7794	7568	6855	6722
Na	2632.8	2756.0	2613.2	2922.0	2765.7	2629.1	2431.5
K	158.8	596.4	154.1	236.6	300.6	191.3	204.4
Ca	17.1	9.1	10.5	13.0	15.5	28.2	17.2
Mg	3.0	1.9	2.9	2.1	2.1	2.9	0.8
Fe	ND[1]	ND	ND	0.04	0.05	ND	0.15
SiO_2	171.4	197.7	170.9	212.2	213.3	182.6	224.7
B	7.8	7.4	7.8	7.0	5.9	5.8	5.5
Li	5.7	7.1	5.5	8.1	8.1	7.4	7.2
Sr	2.0	1.9	1.2	2.2	2.9	4.0	3.1
Zn	0.08	ND	ND	ND	ND	ND	ND
As	ND	ND	0.64	ND	0.51	ND	ND
Ba	0.59	0.41	0.51	0.51	0.63	0.36	ND
F	1.8	3.5	2.0	3.0	3.2	2.5	3.6
HCO_3	357.0	477.0	419.0	401.0	306.0	357.0	392.0
CO_3	ND	ND	ND	ND	11.0	ND	15.0
Cl	3820.0	4320.0	3700.0	4250.0	4110.0	3930.0	3620.0
SO_4	95.0	123.0	94.0	107.0	112.0	113.0	126.0
pH	8.3	6.0	8.2	8.4	8.6	8.2	8.7
Conductivity μ mhos/cm	12220	14000	11800	13400	13000	12300	11700
Well Characteristics							
Total Depth (ft.)	6000	5998	6000	6047	5500	5890	5890
Completion Interval (ft.)	2718-5980	2625-5975	2642-5980	2598-6000	2677-5480	2657-5885	2566-5876

Upon completion, the wells will begin discharging into the on-site containment basins for short-term production flow tests.

[1]Not Detected

6. Following analysis of the data from these flow tests, the well may be flowed again for one or more tests of one week or longer duration. The flow from this test is either discharged into the on-site storage basin or other test facilities via permanent, or as necessary, temporary pipelines placed on the ground adjacent to access roads. Discharged fluids are removed from the storage basins or other containers and discharged by subsurface injection into the geothermal reservoir or the fluid is allowed to evaporate. These production fluids have been reinjected into the geothermal reservoir at depths of 2,400 to 5,000 feet.

7. A mudpit, capable of containing the expected discharge of drilling mud and cuttings, was constructed at each well site. Additional mudpits would be constructed at any newly drilled well sites.

8. A lined containment basin consisting of a minimum of 6 inches of compacted clay with a permeability maximum of 1×10^{-6} cm/sec was constructed at each well site. Additional containment basins would be constructed at any newly drilled well sites.

9. A clay-lined plant storage basin has been constructed at the plant site to contain sands and temporarily store geothermal fluids produced from the sand separators and injection filters.

10. Final disposal of geothermal wastes discharged to containment basins would be by subsurface injection or by hauling said wastes to a waste management facility approved by the Regional Board.

11. All such containment basins and mudpits described in Findings 7, 8, 9, and 10, above, have been protected and maintained to ensure their effectiveness.

12. The geothermal fluid injection system consists of injection pumps, distributing piping, injection well metering facilities, and other components necessary to dispose of the geothermal liquid from the power plant. Geothermal fluid treatment is not part of the geothermal fluid injection system at this time.

13. On March 18, 1987, the Regional Board approved Negative Declaration SCH # 87021821, for this project in accordance with the California Environmental Quality Act and State Guidelines. In accordance with Section 15301, Chapter 3, Title 14 of the California Code of Regulations, which govern the operation of an existing facility involving negligible or no expansion of use beyond that previously existing, the existing Ormesa II facility is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.).

14. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the proposed discharge.

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

16. The United States Department of Energy (USDOE) is currently subject to Waste Discharge Requirements (Board Order No. 89-027), adopted by the Regional Board on May 17, 1989, which specifically states that East Mesa Wells No. 5-1, 6-1, 6-2, 8-1, and 31-1 are the property of USDOE.

17. In a letter from USDOE to the discharger dated July 31, 1989, the discharger was granted permission to use some of the wells belonging to USDOE for disposal of cooling tower blowdown and/or geothermal brines, as long as the transfer of the facility from USDOE to the discharger continued on a "quid pro quo" basis.

18. Two shallow ponds, each approximately 5 acres in size, are located within the SE¼ of the SW¼ of Section 6, T16S, R17E, SBB&M. The Imperial Irrigation District Highline Canal is located approximately 1-3/4 miles west of the proposed power plant site.

19. Mechanical draft cooling towers have been built at the power plant in one battery containing six cells. These cooling towers are erected on a concrete basin which is used for cooling water storage.

20. Shallow ground water produced from Sweetwater Well 3 located near the center of Section 6, T16S, R17E, SBB&M has a reported Total Dissolved Solids (TDS) concentration of 1776 mg/l.

21. The Water Quality Control Plan (Basin 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 Imperial Hydrologic Unit.

22. Beneficial uses of water in certain portions of the Imperial Hydrologic Unit are:

    a. Industrial supply
    b. Municipal supply (This use is limited to a small portion of the hydrologic unit, with the existing use being practically inconsequential.)

23. Geothermal projects are also regulated by the California Division of Oil and Gas and appropriate federal agencies. 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.

IT IS HEREBY ORDERED, East Mesa Partners and Ormesa Geothermal II 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 cleanout fluid and geothermal test fluid shall be discharged for temporary storage into either:

   a. Earthen basins with a minimum 6 inch compacted clay lining having a liner permeability not to exceed 1 X 10^{-6} cm/sec. A 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.

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

4. Permanent (longer than 1 year) disposal or storage of geothermal waste in on-site temporary containment basins is prohibited.

5. A minimum of two feet of freeboard shall be maintained in all containment basins at all times.

6. The discharger shall submit to the Board within 30 days of adoption of this Board Order, written adequate assurance that financial responsibility for cleanup of the facilities is feasible. This shall be in the form of the latest annual report for the discharger, as well as a Securities and Exchange Commission Form 10-K. Should the Regional Board Executive Officer determine that the Annual Report and Form 10-K are not adequate to prove financial assurance, then a closure bond of $100,000 shall be submitted to the Regional Board office within 60 days from the date of said determination.

7. The discharger shall submit to the Regional Board, at least 10 days prior to the discharge of any material into a <u>new</u> basin as defined in Discharge Specification and Prohibition No. 2, above, a report prepared by a California Registered Civil Engineer or Certified Engineering Geologist certifying that the containment basin constructed to meet the requirements of this Order.

8. Fluids discharged by subsurface injection shall be injected below the fracture pressure of the receiving aquifer and of the confining layer immediately above the receiving aquifer.

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 of the injection water is less than or equal to that of the receiving water, or the discharger can demonstrate to the satisfaction of the Executive Officer that injection into said zone will not pose a threat to water quality.

10. Solids which may accumulate in the concrete cooling tower basin may not be spread on the surrounding property until an analysis has been performed to ensure that there are no constituents in hazardous

concentrations and written approval for such a disposal is granted to the discharger by the Regional Board's Executive Officer.

11. Prior to the disposal of any materials removed from the temporary storage basins, well pads, or other developed project locations, other than by subsurface injection, the discharger shall inform the Executive Officer concerning the nature and volume of the materials and the proposed location of disposal.

12. 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.

13. Adequate protective works and maintenance shall be provided to ensure that all basins shall not become eroded or otherwise damaged by floods occurring during the project life of said basins.

14. Pending the transfer of the facilities and properties owned by USDOE to the discharger, the wells described in Finding No. 16, above, are still subject to Board Order No. 89-027. Cooling tower blowdown and geothermal brines from the Ormesa II Project may be disposed of in the wells owned by USDOE pending the successful transfer of ownership of USDOE facilities, as long as both the USDOE and the Regional Board's Executive Officer concur. At the time of transfer, the discharger (or other purchaser) shall be responsible for complete compliance with Board Order No. 89-027.

15. Once the wells at each new well-site described in Finding No. 7, above, have been completed, their respective mudpits shall have all of the drilling mud and cuttings removed and disposed of in a manner acceptable to the Regional Board's Executive Officer. The final disposal of these wastes and the final closure of the respective mudpits shall be completed within 60 days of the completion of the drilling of the respective wells.

B. Provisions

1. The discharger shall comply with "Monitoring and Reporting Program No. 89-065" and future revisions thereto, as specified by the Executive Officer.

2. The discharger shall submit to the Regional Board, at least 30 days prior to commencement of operations 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 10 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 basins and attendant facilities are constructed to meet the requirements of this Order.

4. 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 Regional Board.

5. Injection wells owned by the United States Department of Energy (USDOE) No. 5-1, 6-1, 6-2, 8-2, and No. 31-1 are covered by Regional Board Order No. 89-027 adopted on May 17, 1989, and not by this Board Order No. 89-065.

6. Only cooling tower blowdown and fluids from the wells described in Finding No. 3 and No. 4, above, shall be injected into the disposal wells described in Finding No. 3 and No. 4, above, and then only in accordance with the requirements set forth in this Board Order No. 89-065.

7. None of the geothermal fluids or cooling tower waters may be used on access roads, well pads, or other developed project locations for dust control.

8. This Board Order does not authorize violation of any federal, state, or local laws or regulations.

IT IS HEREBY FURTHER ORDERED that this Board Order shall supersede Board Order 87-34.

I, Phil 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 September 20, 1989 .

Phil Gruenberg
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. 89-065
FOR
EAST MESA PARTNERS
AND
ORMESA GEOTHERMAL II
ORMESA GEOTHERMAL II PROJECT
GEOTHERMAL PRODUCTION FACILITIES
EAST MESA KNOWN GEOTHERMAL RESOURCE AREA (KGRA)
East of El Centro - Imperial County

Location of Discharge: Federal Geothermal Lease No. CA-6218 - Section 1, T16S, R16E, SBB&M; Sections 4, 5, and 6, T16S, R17E, SBB&M

MONITORING

Ormesa Geothermal shall report monitoring data to the Regional Board in accordance with the following schedule:

1. The discharger shall submit to the Regional Board, at least 30 days prior to commencement of operation at each well, a written report on the proposed method and estimated costs of cleanup and closure of each well site in a manner which would not adversely affect water quality.

2. At least 10 days prior to the discharge of any materials into a temporary storage basin or other container, the discharger shall submit to the Regional Board a technical report signed by a California Registered Civil Engineer advising the Executive Officer that the temporary storage basin and attendant facilities are constructed to meet the requirements contained in Board Order No. 89-065.

3. The discharger shall submit a monthly report containing the following information:

Constituents	Units	Reporting Frequency
a. Volume of discharges contained in each temporary storage basin.	Gallons	Monthly
b. Volume of waste fluid injected into each injection well.	Gallons	Monthly
c. Total dissolved solids concentration of waste fluid injected into each injection well.	mg/l	Monthly
d. Total dissolved solids concentration of ground water contained in strata proposed to receive waste fluid injection	mg/l	At least 10 days prior to commencement of injection

4. Immediate reporting of any accidental spillage or release of waste material, and immediate measures being taken to correct same and to limit detrimental effects.

5. Report of completion of removal of all geothermal waste from temporary storage basins within one week following completion of work.

6. At least 10 days prior to destruction of each temporary storage basin the discharger shall request a Regional Board staff inspection and approval of the cleanup procedures.

REPORTING

Except for Items 1 and 2, above, the 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 4, above, shall be forwarded immediately and shall be preceded by telephone communication to the Regional Board's office, Phone No. (619) 346-7491. Copies of the reports submitted to the Board pursuant to the 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.

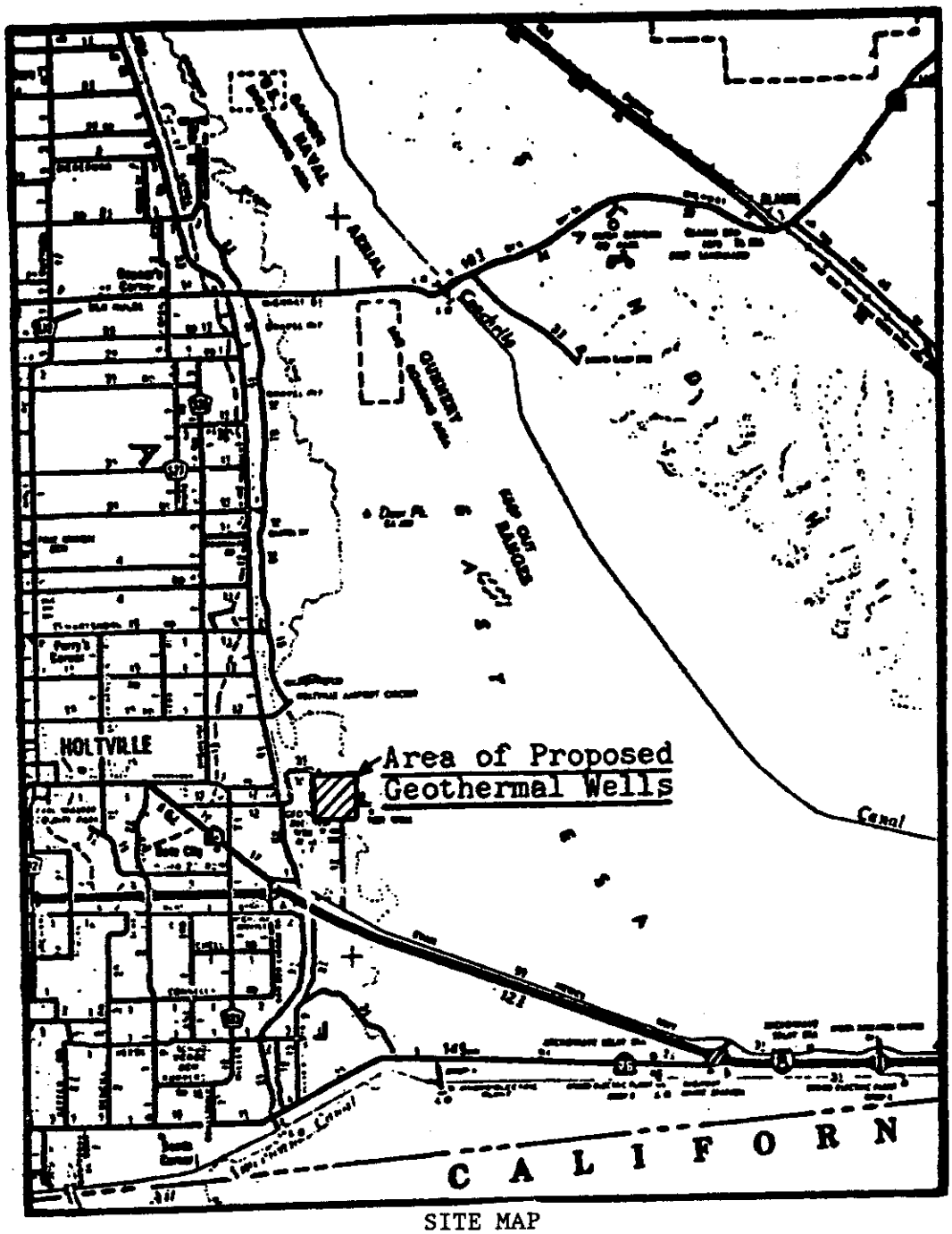
Mail reports to:

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

ORDERED BY: Phil Gruenberg
Executive Officer

September 20, 1989
Date

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - 7



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Scale:
1" = 4.5 mi.

SITE MAP
EAST MESA PARTNERS
AND
ORMESA GEOTHERMAL II
ORMESA GEOTHERMAL II PROJECT
GEOTHERMAL PRODUCTION FACILITIES
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