

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION**

MONITORING AND REPORTING PROGRAM NO. 00-103
FOR
ORMESA GEOTHERMAL, PLANT AND WELLFIELD OWNER
U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT, LAND OWNER
FPL ENERGY, AGENT FOR THE PLANT AND WELLFIELD OWNER
FPL ENERGY OPERATING SERVICES, INC., OPERATOR
EAST MESA GEOTHERMAL PROJECTS- PLANT EAST MESA (PEM) UNIT 1, FACILITY NAME
GEOTHERMAL WELLFIELD AND CONTAINMENT BASINS/MUD PITS
Southeast of Holtville - Imperial County

Location of Discharge: Sections 19, 28, 29, 30, and 31, T15S, R17E, SBB&M

A. MONITORING GENERAL

1. The reporting responsibilities of the discharger are specified in the California Water Code. This self-monitoring program is issued in accordance with Provision No. 1 of Regional Board Order No. 00-103. The principal purpose of this Monitoring Program is:
 - a. To document compliance with the Waste Discharge Requirements adopted by the California Regional Water Quality Control Board.
 - b. To facilitate self-policing by the discharger in the prevention and abatement of pollution arising from the discharge.
 - c. To conduct water quality analyses.
2. All sampling methods not specified below or in the Monitoring and Reporting Program shall be conducted in accordance with U.S. Environmental Protection Agency approved procedures. Analyses shall be conducted by a laboratory certified by the California Department of Health Services to perform the required analyses, unless a field analysis is specified.
3. The Regional Board's Executive Officer may alter the monitoring parameters and/or the monitoring frequency during the course of this monitoring program.

B. MONITORING REPORTS AND OBSERVATION SCHEDULE

"Reporting Period" means the duration separating the submittal of a given type of monitoring report from the time the next iteration of that report is scheduled for submittal. The reporting period for the Detection Monitoring Program is semi-annual. An annual report, which is a summary of all the monitoring during the previous year, shall also be submitted to the Regional Board. The submittal dates for each reporting period shall be as follows:

1. Semi-annual Monitoring Reports (Detection Monitoring Reports)
 - a. First Semi Annual (January 1, through June 30) - report due by July 31
 - b. Second Semi-Annual (July 1 through December 31) - report due February 15

2. Annual Summary Report

January 1 through December 31 - report due on March 15 of the following year.

C. REPORTS TO BE FILED WITH THE BOARD

A written "Detection Monitoring Report" (Semi-Annual Report) shall be submitted twice annually, in addition to an "Annual Summary Report". The reports shall be submitted by the above-specified dates. The following information/data shall be included in each report:

1. Semi - Annual Monitoring (Detection Monitoring) Report Requirements:

a. General Information

The following shall be included:

1. Estimated total volume of fluid discharged during the reporting period, if any, in each containment basin/mud pit.
2. Estimated total volume of fluid contained in each containment basin/mud pit by the reporting period.
3. If any solid waste has been discharged during the reporting period to the containment basins/mud pits, estimated volume discharged and estimated volume by the reporting time.
4. The general conditions of the containment basins/mud pits including any observation of erosion.
5. Description of any maintenance done to the containment basins/mud pits.
6. For all occurrences of spills/leaks of reportable quantities during the reporting period, a summary of each incident detailing the essential points of the cause of the spill/leak shall be transmitted in the semi-annual (detection monitoring) report. The summary shall include estimated volumes of liquid/geothermal fluid or solid waste spilled/leaked outside the containment basins/mud pits, and a description of the management practices addressing each spill/leak of waste for each incident occurring in the reporting period. Reportable quantities are 150 gallons of geothermal brine or other geothermal waste released outside the containment basins/mud pits.
7. Description of any detected liquid leaving or entering the containment basins/mud pits, including estimated size of affected area, and flow volume.
8. Letter of Transmittal. A letter transmitting the essential points shall accompany each report. Such a letter shall include a discussion of any requirement violations found since the last such report was submitted, and shall describe actions taken or planned for correcting those violations. If the discharger has previously submitted a detailed time schedule for correcting the violations, a reference to the correspondence transmitting the schedule will be satisfactory. If no violations have occurred since the last submittal, this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer, at the level of vice-president or above, or by his/her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.

b. Monitoring for Containment Basins/Mud pits:

The containment basins/mud pits monitoring system consists of a number of solids and liquid waste monitoring approach. The solid and liquid waste monitoring sampling assists in determining whether the ground water has been or might be impacted by the discharge operation. The monitoring frequency is quarterly and annually. The reporting frequency semi-annual and annually. The following are the monitoring and reporting requirements:

1. Pre-sampling for Samples Obtained From the Containment Basins/Mud pits: For each monitoring point addressed by the report, a description of the calibration of the field equipment, method and time of water level measurement, placement of the sampler in the containment basin/mud pit, method of rinsing the equipment, methods used to monitor field pH, temperature, conductivity, and the method of disposing of the rinse water shall be included in each monitoring report.
2. Sampling: For each monitoring point addressed by the report, a description of the type of sampler - or other device - used and its placement for sampling, and detailed description of the sampling procedure (number and description of the samples, field blanks, travel blanks, and duplicate samples taken, the type of containers and preservatives used, the date and times of sampling, the names and qualifications of the person actually taking the samples, and any other observations).
3. Water samples (if any water present during reporting period), shall be collected once per quarter from each containment basin/mud pit and analyzed for the following constituents: suspended solids, total dissolved solids, pH, specific conductance, carbonate, phosphate, sulfate, iron, and oil and grease.
4. Water samples also shall be collected once per year from each containment basin/mud pit by November/December of each year following adoption of this Board Order, and analyzed for the following constituents: arsenic, antimony, cadmium, lead, total chromium, copper, manganese, barium, zinc, and total petroleum hydrocarbons.
5. If the containment basins/mud pits are dry by the yearly sampling times, and if liquid or solid waste has been discharged during the year to the basins/mud pits, soil samples shall be collected from the basins/mud pits by November/December and analyzed for the following constituents: carbonate, phosphate, sulfate, iron, and oil and grease, arsenic, antimony, lead, total chromium, cadmium, manganese, copper, barium, zinc, and total petroleum hydrocarbons.

c. Production and Injection Wells Monitoring:

The production and injection wells monitoring system consists of a liquid waste monitoring approach. The liquid waste sampling assists in determining whether the ground water has been or might be impacted by the discharge operation. The monitoring frequency is annual. The reporting frequency is annual. The following are the monitoring and reporting requirements:

For the production wells listed below, (1) provide, for each well tested (if any), a summary of any integrity test results conducted to comply with the requirements of the BLM and State of California, or Department of Conservation, Division of Oil, Gas and Geothermal Resources, (2) provide a summary of medium and major repairs (if any) and (3) collect one (1) composite sample per year from the incoming production line main header and analyze for the following: TDS, suspended solids, conductivity, and pH.

For the injection wells listed below, (1) provide, for each well tested, a summary of the integrity test results conducted to comply with the requirements of the BLM and State of California, Department of Conservation, Division of Oil, Gas and Geothermal Resources (if any), (2) provide a summary of medium and major repairs, (3) Report the estimated volume injected in each injection well, and (4) collect one (1) composite sample per year from the injection line of the main re-injection header leaving the facility of geothermal fluid injected and analyze for the following: TDS, suspended solids, conductivity, and pH.

The following specifies the production and injection wells:

<u>Wells</u>	<u>Type</u>	<u>T., R., SBB&M</u>	<u>Location</u>
11-31	Injection	T15S, R17E, SBB&M	300 ft. S. & 250 ft. E. of NW Corner Sec. 31
16-29	Injection	T15S, R17E, SBB&M	100 ft. E. & 1420 ft. E. of SW Corner Sec. 29
18-28	Injection	T15S, R17E, SBB&M	175 ft. N. & 100 ft. E. of SW Corner Sec. 28
34-30	Injection	T15S, R17E, SBB&M	3330 ft. N. & 1850 ft. W. of SW Corner Sec. 30
52-29	Injection	T15S, R17E, SBB&M	725 ft. S. & 2500 ft. W. of NE Corner Sec. 29
56-19	Injection	T15S, R17E, SBB&M	1495 ft. S. & 2740 ft. E. of SW Corner Sec. 19
56-29	Injection	T15S, R17E, SBB&M	1400 ft. N. & 2425 ft. N. of SE Corner Sec. 29
58-30	Injection	T15S, R17E, SBB&M	2740 ft. E. & 175 ft. N. of SW Corner Sec. 30
76-30	Injection	T15S, R17E, SBB&M	4060 ft. E. & 1495 ft. N. of SW Corner Sec. 30
78-19	Injection	T15S, R17E, SBB&M	116 ft. N. & 24060 ft. E. of SW Corner Sec. 19
16-30	Production	T15S, R17E, SBB&M	100 ft. E. & 1495 ft. N. of SW Corner Sec. 30
36-31	Production	T15S, R17E, SBB&M	1520 ft. N. & 1435 ft. N. of SW Corner Sec. 31
38-30	Production	T15S, R17E, SBB&M	1429 ft. E. & 199 ft. N. of SW Corner Sec. 30
54-31	Production	T15S, R17E, SBB&M	2769 ft. E. & 2772 ft. N. of SW Corner Sec. 31
56-30	Production	T15S, R17E, SBB&M	2740 ft. E. & 1496 ft. N. of SW Corner Sec. 30
72-31	Production	T15S, R17E, SBB&M	4060 ft. N. & 4075 ft. N. of SW Corner Sec. 31
74-30	Production	T15S, R17E, SBB&M	4060 ft. E. & 2815 ft. N. of SW Corner Sec. 30
76-31	Production	T15S, R17E, SBB&M	4060 ft. E. & 1735 ft. N. of SW Corner Sec. 31
78-30	Production	T15S, R17E, SBB&M	4060 ft. E. & 175 ft. N. of SW Corner Sec. 30
88-31	Production	T15S, R17E, SBB&M	5023 ft. E. & 600 ft. N. of SW Corner Sec. 31

2. Annual Summary Report

The discharger shall submit an annual report in March of the following year to the Regional Board covering the previous monitoring year. The reporting period ends December 31 of each year. This report shall contain:

- a. All monitoring analytical data obtained during the previous two (2) six-month Reporting Periods presented in tabular form.
- b. A comprehensive discussion of compliance, and the result of any corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.
- c. A written summary of water or solid waste analyses, indicating any changes, if any, made since the previous annual report.

3. Contingency Reporting

- a. The discharger shall report by telephone concerning any spill of reportable quantity of waste material from the designated area within 48 hours after it is discovered. A written report shall be filled with the Regional Board within seven (7) days, containing at least the following information:
 1. A map showing the location(s) of the discharge;
 2. A description of the nature of the discharge (e.i., all pertinent observation and analyses including quantity, duration, etc.); and
 3. Corrective measures underway or proposed.
- b. Should a subsurface release be tentatively identified, the discharger shall verbally notify within 48 hours the Regional Board as to the monitoring point(s) and constituents or parameter(s) involved, shall provide written notification within seven (7) days of such determination, and shall carry out a discrete retest. If the retest confirms the existence of a release, the discharger shall carry out the requirements of C.d. below. In any case, the discharger shall inform the Regional Board of the outcome of the retest as soon as the results are available, following up with written results submitted by certified mail within seven days of completing the retest.
- c. If either the discharger or the Regional Board determines that there is significant physical evidence of a release, the discharger shall immediately notify the Regional Board of this fact (or acknowledge the Regional Board's determination) and shall carry out the requirements of C.d., below, for all potentially-affected monitored media.
- d. If the discharger concludes that a release has been discovered:
 1. If this conclusion is not based upon "direct monitoring" of the Constituents of Concern, then the discharger shall, within thirty days, sample for all Constituents of Concern at all Monitoring Points and submit them for laboratory analysis. Within seven (7) days of receiving the laboratory analytical results, the discharger shall notify the Regional Board of the concentration of all Constituents of Concern at each Monitoring Point.
 2. The discharger shall, within 90 days of discovering the release, submit a Revised Report of Waste Discharge proposing an Evaluation Monitoring Program.

3. The discharger shall, within 180 days of discovering the release, submit a preliminary engineering feasibility study for remediation.
- e. Any time the discharger concludes - or the Regional Board's Executive Officer concludes - that a liquid/gaseous/phase release from the PEM Unit 2 has proceeded beyond the facility boundary, the discharger shall so notify all persons who either own or reside upon the land that directly overlies any part of the plume (affected persons).
 1. Initial notification to affected persons shall be accomplished within seven (7) days of making this conclusion and shall include a description of the discharger's current knowledge of the lateral and vertical extent of the release; and
 2. Subsequent to initial notification, the discharger shall provide updates to all Affected Persons - including any newly Affected Persons - within seven (7) days of concluding there has been any material change in the lateral or vertical extent of the release.

D. RECORDS TO BE MAINTAINED

Written reports shall be maintained by the discharger or laboratory, and shall be retained for a minimum of five (5) years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board. Such records shall show the following for each sample:

1. Identity of sample and of the monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
2. Date and time of sampling;
3. Date and time that analyses were started and completed, and the name of the personnel performing each analysis;
4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagent used;
5. Calculation of the results; and
6. Result of analyses, and the Maximum Detection Limit (MDL) for each analysis.

SUMMARY OF MONITORING AND REPORTING REQUIREMENTS

C.(1).(a). General Information

<u>Parameters</u>	<u>Unit</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
1. Estimated total volume of fluids discharged to containment basins/mud pits during the reporting period.	-----	-----	Semi-annual the
2. Estimated total volume of fluid contained in each containment basin/mud pit by the reporting time.	-----	-----	Semi-annual
3. Estimated total volume of solid discharged in each containment basin/mud pit during the reporting period and volume by the reporting time, if any.	-----	-----	Semi-annual total
4. Conditions of the containment basins/mud pits.	-----	-----	Semi-annual
5. Description of maintenance provided to the containment basins/mud pits.	-----	-----	Semi-annual
6. A summary report of spill/leaks of reportable quantity, any.	-----	-----	Semi-annual if
7. Description of any detected liquid leaving or entering WMU, including affected area, and flow volume.	-----	-----	Semi-annual the
8. Letter of transmittal	-----	-----	Semi-annual

C.(1).(b). Containment Basins/Mud Pits Monitoring

<u>Parameters</u>	<u>Unit</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
1. Description of pre-sampling for samples obtained from the containment basins/mud pits.	-----	Quarterly	Semi-annual
2. Description of sampling procedures.	-----	Quarterly	Semi-annual
3. Water samples	-----	Quarterly	Semi- annual
1. Suspended solids	mg/L	Quarterly	Semi-annual
2. Total dissolved solids	mg/L	Quarterly	Semi-annual
3. pH	#	Quarterly	Semi-annual
4. Specific conductance	µmohs/cm	Quarterly	Semi-annual
5. Carbonate	mg/L	Quarterly	Semi-annual
6. Phosphate	mg/L	Quarterly	Semi-annual
7. Sulfate	mg/L	Quarterly	Semi-annual
8. Iron	mg/L	Quarterly	Semi-annual
9. Oil and grease	mg/L	Quarterly	Semi-annual
4. Water samples			

1. Arsenic	mg/L	Annually	Annually
2. Antimony	mg/L	Annually	Annually
3. Lead	mg/L	Annually	Annually
4. Total chromium	mg/L	Annually	Annually
5. Cadmium	mg/L	Annually	Annually
6. Manganese	mg/L	Annually	Annually
7. Copper	mg/L	Annually	Annually
8. Barium	mg/L	Annually	Annually
9. Zinc	mg/L	Annually	Annually
10. Total petroleum hydrocarbon	mg/L	Annually	Annually
5. Solid waste samples			
1. Carbonate	mg/L	Annually	Annually
2. Phosphate	mg/L	Annually	Annually
3. Sulfate	mg/L	Annually	Annually
4. Iron	mg/L	Annually	Annually
5. Oil and grease	mg/L	Annually	Annually
6. Arsenic	mg/L	Annually	Annually
7. Antimony	mg/L	Annually	Annually
8. Lead	mg/L	Annually	Annually
9. Total chromium	mg/L	Annually	Annually
10. Cadmium	mg/L	Annually	Annually
11. Manganese	mg/L	Annually	Annually
12. Copper	mg/L	Annually	Annually
13. Barium	mg/L	Annually	Annually
14. Zinc	mg/L	Annually	Annually
15. Total petroleum hydrocarbon	mg/L	Annually	Annually

C.(1.)(c) Production and Injection Wells Monitoring

For the Production Wells:

1. Provide summary of integrity test result (if any).	-----	Annually	Annually
2. A summary of any medium and major repairs.	-----	Annually	Annually
3. Collect one composite sample from the production inlet header to the plant and analyze for the following:			
a. Total dissolved solids	mg/L	Annually	Annually
b. Suspended solids	mg/L	Annually	Annually
c. Specific conductance	µmohs/cm	Annually	Annually
d. pH	#	Annually	Annually

For the Injection Wells:

1. Provide summary of integrity test result (if any).	-----	Annually	Annually
2. A summary of any medium and major repairs.	-----	Annually	Annually
3. Estimated volume of geothermal fluid injected in each well.	-----	Annually	Annually
4. Collect one composite sample of injecting geothermal fluid from the injection discharge header of the plant and analyze for the following:			
a. Total dissolved solid	mg/L	Annually	Annually
b. Suspended solids	mg/L	Annually	Annually
c. Specific conductance	µmohs/cm	Annually	Annually
d. pH	#	Annually	Annually
C.(2). Annual Summary Report	-----	-----	Annually
C.(3). Contingency Reporting	-----	-----	Within 48 hrs.

REPORTING

1. The discharger shall arrange the data in tabular form so that the specified information is readily discernible. The data shall be summarized in such a manner as to clearly illustrate whether the facility is operating in compliance with waste discharge requirements.
2. Records of monitoring information shall include:
 - a. The date, exact places, and time of sampling or measurement(s);
 - b. The responsible individual(s) who performed the sampling or measurement(s);
 - c. The date(s) analyses were performed;
 - d. The individual(s) responsible for reviewing the analyses;
 - e. The analytical techniques or method used; and
 - f. The result of such analyses.
3. Each report shall contain the following statement:

“I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”
4. A duly authorized representative of the discharger may sign the documents if:
 - a. The authorization is made in writing by the person described above;
 - b. The authorization specified an individual or person having responsibility for the overall operation of the regulated disposal system; and
 - c. The written authorization is submitted to the Regional Board’s Executive Officer.
5. Monitoring reports shall be certified under penalty of perjury to be true and correct, and shall contain the required information at the frequency designated in this monitoring report.

6. Semi-annual monitoring reports shall be submitted to the Regional Board in accordance with the following schedule:

First Semi-annual (January 1 through June 30) - due July 31

Second Semi-annual (July 1 through December 31) - due February 15

7. Annual summary report shall be submitted to the Regional Board by March 15 of each year.

8. Submit Monitoring Reports to:

California Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

Ordered by: original signed by/
Executive Officer

September 13, 2000

Date