

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

ORDER R7-2011-0038

**WASTE DISCHARGE REQUIREMENTS  
FOR  
CE OBSIDIAN ENERGY LLC, OWNER  
BLACK ROCK 1, 2 AND 3 GEOTHERMAL POWER PROJECT  
WELLFIELD MUD SUMPS/CONTAINMENT BASINS**

Salton Sea Known Geothermal Resource Area (KGRA) - Imperial County

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

1. CE Obsidian Energy, LLC (the Discharger) proposes drilling 22 geothermal wells on land owned by Imperial Magma, LLC, an affiliate of CE Obsidian. The wells will support three 53- megawatt power plants named Black Rock 1, 2 and 3 (the Black Rock 1, 2 and 3 Geothermal Power Project, or Project). The wells are located within the Salton Sea Known Geothermal Resource area (KGRA), 6 miles northwest of the community of Calipatria and approximately 7.5 miles southwest of community of Niland. The address for both CE Obsidian Energy, LLC and Imperial Magma, LLC is 1111 South 103<sup>rd</sup> Street, Omaha, NE 68124.
2. This Board Order regulates the handling and disposal of drilling wastes generated by CE Obsidian Energy, LLC during geothermal well drilling, testing, and maintenance in the vicinity of the Salton Sea KGRA. The boundaries of the Black Rock 1, 2, and 3 Geothermal Power Project are shown on Attachment A.
3. The Discharger reports that the exploration program will initially consist of twenty-two geothermal wells and six mud sumps. Locations of the proposed wells are shown on Attachment A. All geothermal well drilling performed by CE Obsidian Energy, LLC within Salton Sea KGRA will be regulated under this Order.
4. CE Obsidian Energy, LLC submitted a Report of Waste Discharge, dated July 30, 2009, for the Black Rock 1, 2 and 3 Geothermal Power Project.
5. The Project will consist of well pad construction, geothermal exploration drilling, and waste handling and disposal. A typical mud sump configuration is shown on Attachment B.
6. The wells will be drilled for production and injection of geothermal brine associated with the proposed geothermal power plants.
7. Definition of terms used in this Board Order:
  - a. **Facility** – The entire parcel of property where CE OBSIDIAN ENERGY, LLC. or related geothermal industrial and drilling activities are conducted.
  - b. **Waste Management Unit (WMUs)** – Mud sumps/containment basins are WMUs.

- c. **Discharger** – The term “Discharger” means any person who discharges waste that could affect the quality of the waters of the State, and includes any person who owns the land, waste management unit, or who is responsible for the operation of a waste management unit. Specifically, the terms “discharger” or “dischargers” in this Board Order means CE Obsidian Energy, LLC.

Geothermal Drilling Wastes

8. The following wastes are generated during construction, operation, and maintenance of geothermal exploration wells:

- a. **Geothermal brine** – The Discharger reports geothermal brines in the area of the Salton Sea KGRA are hot saline solutions that contain Total Dissolved Solids (TDS) up to 235,000 mg/L. Based on nearby geothermal projects, major constituents of the brine are predicted to be the following:

Anticipated Chemical Composition of Produced Fluids

Constituent	Concentration (ppm)
Beryllium	ND <sup>1</sup>
Ammonium	369
Sodium	50,169
Magnesium	39
Aluminum	ND <sup>1,2</sup>
Potassium	12,784
Calcium	24,584
Chromium	ND <sup>1</sup>
Manganese	983
Iron	1,180
Nickel	ND <sup>1</sup>
Copper	4
Zinc	320
Rubidium	69
Strontium	443
Silver	ND <sup>1</sup>
Cadmium	1
Antimony	1
Cesium	12
Barium	177

### Anticipated Chemical Composition of Produced Fluids

Constituent	Concentration (ppm)
Mercury	ND <sup>1</sup>
Lead	79
Bicarbonate	69
Nitrate	ND <sup>1</sup>
Fluorine	20
Sulfur Monoxide	98
Chlorine	137,670
Arsenate	20
Selenate	ND <sup>1</sup>
Bromine	89
Iodine	10
Silicon Dioxide	433
Carbon Dioxide	3,309
Boric Acid	1,800
Hydrogen Sulfide	15
Ammonia	59
Methane	10
Total Dissolved Solids	235,000

ND = Not Detected

<sup>1</sup> Several of the constituents listed as ND have been detected in brine from this resource, although the quantities may be present at trace levels.

<sup>2</sup> Aluminum is known to be present in measurable quantities in brine from this resource.

Source: AECOM, 2009

- b. **Drilling muds with additives** – Drilling mud is inert mineral clay such as bentonite clay. Drilling mud additives may include sodium bicarbonate, soda ash, drilling soap, organic polymers, wood fibers, graphite, cottonseed hulls, walnut shells and cement. Drilling mud additives do not render the drilling mud hazardous when used according to manufacturer's specifications.
- c. **Drill cuttings (rock)** – small rock fragments pulverized during drilling and forced to the surface by drilling mud, aerated mud, and/or air.

#### Drilling Waste Containment (WMUs)

9. The Discharger proposes to contain geothermal brine generated during drilling, testing, or maintenance by discharging into large portable tanks. Geothermal brine will be returned to the geothermal resource via injection, or discharged offsite into permanent Class II surface impoundments constructed pursuant to Title 27 of the California Code of Regulations (Title 27).
10. Drilling muds and rock cuttings generated during well drilling, testing, or maintenance will be discharged to mud sumps/containment basins designed to temporarily (less than one (1) year) contain the material while drying. The six mud sumps are temporary containment ponds that will be decommissioned and removed subsequent to completion of the well construction activities. The mud sumps will be lined impoundments employing polyester fabric/fluoropolymer-coated geosynthetic liner rated for a minimum temperature of 200°F. The liner will be covered with approximately 12 inches of compacted clay to hydraulically isolate the mud sump from the underlying groundwater table. Nominal sump dimensions will be 726 feet long by 11 feet wide by 5 feet deep, with 2 feet of freeboard. Attachment B shows the design of the mud sumps.

#### Drilling Waste Disposal

11. Liquid wastes produced from drilling, testing, and maintenance of geothermal wells, will be contained in portable tanks and returned to the geothermal resource, or discharged off-site to Class II surface impoundments built to construction standards of Title 27.
12. Solids discharged to mud sumps/containment basins will be removed offsite, or closed in place provided representative samples of solids are shown not to be hazardous or designated waste.

#### Surface Water

13. Surface water in the area of the Salton Sea KGRA consists of canals and agricultural drains operated and maintained by Imperial Irrigation District.
14. The Facility is located in a 100-year flood plain. However, Imperial County's Land Use Ordinances, Sections 90106.00 et seq. and 91604.00 et seq., require a Development Permit for construction below -220 feet msl along any portion of the Salton Sea. For the Project, this will require the 160-acre project site to be enclosed by a perimeter berm designed with 2:1 (horizontal to vertical) sloping sides with a top elevation of -220 feet msl. This berm will meet the County's encroachment permit requirements because it will be adequate height to provide flood protection to an elevation of at least -220 feet msl in accordance with the County's Land Use Ordinances and will reduce the potential for offsite drainage.

#### Regional Groundwater

15. The regional groundwater flow direction within the Imperial Valley is toward the Salton Sea, a closed basin with a surface elevation of approximately 225 feet below sea level. The Salton Sea KGRA is located approximately 120 feet below sea level; groundwater flows in a general northwest direction.

### Local Groundwater

16. The Discharger reports that shallow groundwater in the area of the Salton Sea KGRA occurs approximately 3-6 feet below ground surface and flows generally to the northwest. Groundwater from wells within the immediate vicinity of the project contains 10,000 to 20,000 mg/L TDS.
17. Groundwater depth, gradient, and quality in the area of the Salton Sea KGRA may be influenced, at times, by irrigation of adjacent agricultural fields, and by recharge from nearby canals.

### Regional Geology

18. The Black Rock 1, 2 and 3 Geothermal Power Project is located within the Salton Trough area of southeast California. The Salton Trough is a tectonically active zone containing numerous faults associated with the San Andreas Fault Zone. The site is located on the north central portion of the trough, and is underlain by deltaic and lacustrine formations associated with the Colorado River delta. Bedrock in this part of the Salton Trough is approximately three miles below ground surface.

### Climate

19. Climate in the region is arid. Climatological data obtained from 1951 to 1980 indicate an average seasonal precipitation of 2.5 inches, and an average annual pan evaporation rate greater than 100 inches.
20. The wind direction follows two general patterns:
  - a. Seasonally from fall through spring, prevailing winds are from the west and northwest. Most of these winds originate in the Los Angeles basin, and tend to decrease the humidity in the Salton Sea area.
  - b. Summer weather patterns are dominated by intense heat induced low-pressure areas that form over the interior desert, drawing air south of the Facility, which typically increases the humidity in the Salton Sea area.

### Basin Plan

21. The Water Quality Control Plan (Basin Plan) for the Colorado River Basin Region, designates the beneficial uses of ground and surface waters in this region.
22. The beneficial uses of groundwater in the Imperial Hydrological Unit are:
  - a. Municipal Supply (MUN)\*
  - b. Industrial Supply (IND)

\* With respect to the MUN designation, the Basin Plan states: "At such time as the need arises to know whether a particular aquifer which has no known existing MUN use should be considered as a source of drinking water, the Regional Board will make such a determination based on the criteria listed in the 'Sources of Drinking Water Policy' in Chapter 2 of the Basin

Plan. An indication of MUN for a particular hydrologic unit indicates only that at least one of the aquifers in that unit currently supports a MUN beneficial use. For example, the actual MUN usage of the Imperial Hydrologic Unit is limited only to a small portion of that ground water unit."

23. The beneficial uses of surface waters in the area of the Salton Sea Geothermal Exploration Project are as follows:

a. Imperial Valley Drains

- i. Freshwater Replenishment (FRSH)
- ii. Water Contact Recreation (RECI)
- iii. Non-contact Water Recreation (RECII)
- iv. Warm Freshwater Habitat (WARM)
- v. Wildlife Habitat (WILD)
- vi. Preservation of Rare, Threatened, or Endangered Species (RARE)

b. All American Canal System

- vii. Municipal (MUN)
- viii. Agricultural (AGR)
- ix. Aquaculture Supply (AQUA)
- x. Freshwater Replenishment (FRSH)
- xi. Industrial (IND)
- xii. Groundwater Recharge (GWR)
- xiii. Water Contact Recreation (RECI)
- xiv. Non-Contact Water Recreation (RECII)
- xv. Warm Freshwater Habitat (WARM)
- xvi. Wildlife Habitat (WILD)
- xvii. Hydropower Generation (POW)
- xviii. Preservation of Rare, Threatened, or Endangered Species (RARE)

Storm Water

24. Federal regulations for storm water discharges were promulgated by the United States Environmental Protection Agency (USEPA) on November 16, 1990 (40 CFR Parts 122, 123, and 124). These regulations required discharges of storm water to surface waters associated with construction activity, including clearing, grading, and excavation activities (except operations that result in disturbance of less than five (5) acres of total land area and which are not part of a larger common plan of development or sale) to obtain a National Pollutant Discharge Elimination System (NPDES) permit and to implement Best Conventional Pollutant Control Technology and Best Available Technology Economically Achievable to reduce or eliminate storm water pollution. (40 CFR 122.26(b)(14)(x).) On December 8, 1999, federal regulations promulgated by USEPA (40 CFR Parts 9, 122, 123, and 124) expanded the NPDES storm water program to include, in pertinent part, storm water discharges from construction sites that disturb a land area equal to or greater than one acre and less than five acres, or is part of a larger common plan of development or sale (small construction activity). (40 CFR 122.26(b)(15).)

25. To comply with these federal requirements, the State Water Resources Control Board (State Water Board) adopted in 1999 Water Quality Order No. 99-08-DWQ (NPDES) General Permit No. CAS000002, "Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activity" (General Permit). The General Permit specifies WDRs for discharges of storm water associated with construction activity that results in a land disturbance of one acre or more or is part of a larger common plan of development or sale. The General Permit specifies certain construction activities that are exempted from coverage. Because these exemptions do not apply to the Discharger's proposed construction activity and because this activity will result in a land disturbance of more than 1 acre, the Discharger is subject to the General Permit requirements.
26. On September 2, 2009, the State Water Board adopted a new construction general permit (CGP) to replace Order No. 99-08-DWQ. The new CGP, Order No. 2009-0009-DWQ (NPDES No. CAS000002), became effective on July 1, 2010. The website link to this new CGP is as follows:

<[http://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/water\\_quality/2009/wqo/wqo2009\\_0009\\_dwq.pdf](http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2009/wqo/wqo2009_0009_dwq.pdf)>.

#### Anti-Degradation Policy

27. State Water Resources Control Board (State Water Board) Resolution No. 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State"; hereafter Resolution No. 68-16) requires a Regional Board in regulating the discharge of waste to maintain high quality waters of the state (i.e., background water quality) until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in plans and policies (e.g. violation of any water quality objective). The discharge is required to meet waste discharge requirements that result in the best practicable treatment or control of the discharge necessary to assure pollution or nuisance will not occur, and the highest water quality consistent with maximum benefit to the people will be maintained.

#### CEQA

28. The environmental review program of the California Energy Commission (CEC), which has exclusive jurisdiction over the permitting of this Facility, has been certified by the California Secretary for Natural Resources as meeting the requirements of Public Resources Code Section 21080.5 to exempt the CEC's power plant site certification program from the CEQA requirements to prepare EIRs, negative declarations, and initial studies. (See CCR, Title 14, Section 15251(k).) Accordingly, the CEC has prepared the appropriate substitute CEQA environmental documents, identified as the Final Staff Assessment, pursuant to its responsibilities as Lead Agency for this site certification program. As a Responsible Agency under CEQA, the Regional Water Board has considered these substitute environmental documents and the potential impacts to water quality the CEC identified and addressed pursuant to specified mitigation measures made a condition of the CEC's site certification approval. The Regional Water Board

has concluded that compliance with the CEC's mitigation measures and these waste discharge requirements will prevent any significant adverse impacts to water quality.

#### Notification

29. The Regional Board has notified the Discharger and all known interested agencies and persons of its intent to adopt waste discharge requirements for said discharge, and has provided them with an opportunity for a public meeting, and to submit comments.
30. The Regional Board, in a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, that in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, the Discharger shall comply with the following:

#### **A. Discharge Specifications**

1. The treatment or disposal of wastes at this Facility shall not cause pollution or nuisance as defined in Section 13050 of Division 7 of the California Water Code.
2. Waste material at this Facility must be contained at all times.
3. Containment of waste shall be limited to the areas designated for such activity. Any revision or modification of the waste containment area, or change in operation that alters the nature and constituents of the waste produced, must be submitted in writing to the California Energy Commission's Compliance Project Manager (CPM), with copies to the Regional Board Executive Officer for review. The CPM, in consultation with the Regional Board Executive Officer, must approve of the proposed change before the change in operation or modification of the designated area is implemented.
4. Prior to drilling a new well at the Facility, other than those shown on Attachment A, the Discharger shall notify, in writing, both the CPM and the Regional Board Executive Officer of the proposed change.
5. Any substantial increase or change in volume of material to be discharged under these Waste Discharge Requirements (WDRs) must be submitted in writing to the CPM, with copies to the Regional Board Executive Officer, for review. The CPM, in consultation with the Regional Board Executive Officer, must approve of the proposed change before the change in discharge volume is implemented.
6. Liquid or solid geothermal waste discharged to tanks shall be contained at all times.
7. A minimum freeboard of two-feet shall be maintained in mud sumps/containment basins at all times.
8. Following well completion, residual solids and semisolids contained in tanks shall be tested for constituents listed in Monitoring and Reporting Program R7-2011-0038, and for any additional constituents requested by the CPM, in consultation with the Regional Board Executive Officer (if any). Disposal of this material shall be in accordance with applicable laws and regulations based on analytical results of sampling and analysis.

9. Prior to removing solid material discharged to mud sumps/containment basins, the material shall be tested for constituents listed in Monitoring and Reporting Program R7-2011-0038, and for any additional constituents requested by the CPM, in consultation with the Regional Board Executive Officer (if any). Disposal of this material shall be in accordance with applicable laws and regulations based on analytical results of sampling and analysis.
10. Public contact with material containing geothermal wastes shall be precluded through fences, signs, or other appropriate alternatives.
11. Mud sumps/containment basins shall be constructed, operated and maintained to ensure their effectiveness, in particular:
  - a. Erosion control measures shall be implemented;
  - b. Liners in mud sumps/containment basins shall be maintained to ensure proper function, and
  - c. Solid material shall be removed from mud sumps/containment basins in a manner that minimizes the likelihood of damage to the liner.
12. Upon ceasing operation at the facility, all waste, natural geologic material contaminated by waste, and surplus or unprocessed material, shall be removed from the site and disposed of in accordance with applicable laws and regulations.
13. Surface drainage from tributary areas or subsurface sources, shall not contact or percolate through waste discharged at this site.
14. The Discharger shall use the constituents listed in Monitoring and Reporting Program R7-20010-0007 and revisions thereto as "Monitoring Parameters".
15. The Discharger shall implement the attached Monitoring and Reporting Program R7-2011-0038 and revisions thereto to detect at the earliest opportunity any unauthorized discharge of waste constituents from the Facility, or any impairment of beneficial uses associated with (or caused by) discharges of waste to the mud sumps/containment basins.
16. Water used for the process and site maintenance shall be limited to the amount necessary for the process, dust control, and for cleanup and maintenance.
17. The Discharger shall not cause or permit the release of pollutants or waste constituents in a manner that could cause or contribute to a condition of contamination, nuisance, or pollution.

## **B. Prohibitions**

1. Geothermal wells shall be drilled to minimize mixing of drilling mud and cuttings with geothermal brine. Only a small amount of brine may commingle with drilling mud, primarily brines in that part of the formation displaced by the drill bit. Geothermal brine will not be discharged into mud sumps/containment basins. Standing fluid observed in mud sumps/containment basins (if any) will be removed immediately, stored in portable

tanks, and returned to the geothermal resource, or discharged offsite into permitted Class II surface impoundments constructed pursuant to Title 27.

2. The discharge of solid geothermal waste to mud sumps/containment basins as a final means of disposal is prohibited unless authorized by the CPM, in consultation with the Regional Board Executive Officer.
3. The Discharger shall not cause degradation of any groundwater aquifer or supply water.
4. The discharge of waste to land not owned or controlled by the Discharger is prohibited.
5. Use of geothermal brine or drilling muds for dust control on access roads or well pads is prohibited.
6. The discharge of hazardous or designated wastes to areas other than a waste management unit authorized to receive such waste is prohibited.
7. Permanent (longer than one (1) year) disposal or storage of drilling waste to mud sumps/containment basins is prohibited, unless authorized by the CPM, in consultation with the Regional Board Executive Officer.
8. All mud sumps/containment basins must be lined. Drilling waste shall not penetrate the lining during the containment period.
9. Direct or indirect discharge of geothermal drilling wastes in mud sumps/containment basins or tanks, to surface water or surface drainage courses (including canals, drains, or subsurface drainage systems) is prohibited, except as allowed under an appropriate NPDES permit.
10. The Discharger shall neither cause nor contribute to the contamination or pollution of groundwater via the release of waste constituents.

### **C. Provisions**

1. The Discharger shall comply with Monitoring and Reporting Program R7-2011-0038 and future revisions thereto, as specified by the CPM, in consultation with the Regional Board Executive Officer.
2. Unless otherwise approved by the CPM, in consultation with the Regional Board Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants," promulgated by the U.S. Environmental Protection Agency.
3. Prior to any change in ownership of this operation, the Discharger shall transmit a copy of these WDRs to the succeeding owner/operator, and forward a copy of the transmittal letter to both the CPM and the Regional Board Executive Officer.

4. Prior to any modification that would result in a material change in the quality or quantity of discharge, or material change in the location of the discharge, the Discharger shall report all pertinent information in writing to the CPM with copies to the Regional Board Executive Officer, and obtain revised waste discharge requirements before implementing the modification.
5. Synthetic liner placement and welding must be certified by the installer to verify factory requirements were satisfied, and no damage occurred during placement. Certification must be submitted, in writing, to the CPM, with copies to the Regional Board Executive Officer, prior to use of the temporary mud sump/containment basin, or equivalent system approved by the CPM, in consultation with the Regional Board's Executive Officer.
6. The Discharger shall ensure that all site-operating personnel are familiar with the content of these WDRs, and shall maintain a copy of these WDRs at the site.
7. These WDRs do not authorize violation of any federal, state, or local laws or regulations.
8. The Discharger shall allow the CPM, the Regional Board, or an authorized representative, upon presentation of credentials and other documents, as may be required by law, to:
  - a. Enter upon the premises regulated by these, or the place where records must be kept under the conditions of these WDRs;
  - b. Have access to and copy, at reasonable times, any records that shall be kept under the condition of this Board Order;
  - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under these WDRs; and
  - d. Sample or monitor at reasonable times, for the purpose of assuring compliance with these WDRs or as otherwise authorized by the California Water Code, any substances or parameters at this location.
9. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control, and related appurtenances, that are installed or used by the Discharger to achieve compliance with these WDRs. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures.
10. The Discharger shall comply with the following:
  - a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity;
  - b. The Discharger shall retain records of all monitoring information, copies of all reports required by these WDRs, and records of all data used to complete the application of the these WDRs, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by the CPM, in consultation with the Regional Board Executive Officer, at any time;

- c. Records of monitoring information shall include:
    - i. The date, exact place(s), and time of sampling or measurement(s);
    - ii. The individual(s) who performed the sampling or measurement(s);
    - iii. The date(s) analyses were performed;
    - iv. The individual(s) responsible for reviewing the analyses;
    - v. The results of such analyses; and
  - d. Monitoring must be conducted according to test procedures described in the Monitoring and Reporting Program, unless other test procedures have been approved by the CPM, in consultation with the Regional Board Executive Officer.
11. The Discharger is the responsible party for these WDRs, and the Monitoring and Reporting Program for the Facility. The Discharger shall comply with all conditions of these WDRs. Violations may result in enforcement action, including Regional Board Orders or court orders that require corrective action or impose civil monetary liability, or modification or revocation of these WDRs by the CPM, in consultation with the Regional Board Executive Officer.
  12. The Discharger shall furnish, under penalty of perjury, technical monitoring program reports submitted pursuant to the specifications provided by the CPM, in consultation with the Regional Board Executive Officer. Specifications are subject to periodic revision as may be warranted.
  13. The monitoring reports shall be certified to be true and correct, and signed, under penalty of perjury, by an authorized official of the company.
  14. The Discharger's construction activity is subject to the new CGP, which became effective on July 1, 2010, since that activity is scheduled to commence after adoption of this Board Order. To obtain coverage, the Discharger is required to electronically file Permit Registration Documents (PRDs), which includes a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other compliance-related documents required by the CGP and mail the appropriate permit fee to the State Water Board.
  15. These WDRs do not convey property rights of any sort, or any exclusive privileges; nor does it authorize injury to private property, invasion of personal rights, or infringement of federal, state, or local laws and regulations.
  16. These WDRs may be modified, rescinded, or reissued for cause. The filing of a request by the Discharger to modify, or rescind or reissue these WDRs does not stay any WDR condition. Likewise, notification of planned changes or anticipated noncompliance does not stay any WDR condition. Causes for modification include: changes in land application plans, sludge use, or disposal practices; or promulgation of new regulations by the State or Regional Boards, including revisions to the Basin Plan.

17. Within thirty days of the adoption of these WDRs, the Discharger shall submit to the CPM, with copies to the Regional Board Executive Officer, a list of surface landowners (including responsible contact's name, address and phone number) for all land containing existing or proposed facilities and/or appurtenances related to the operation of this Geothermal Power Project. This list will be used to contact responsible parties if corrective action measures become necessary due to a release of pollutants to the environment.

I, Robert Perdue, 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 15, 2011.

  
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ROBERT PERDUE  
Executive Officer

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

MONITORING AND REPORTING PROGRAM R7-2011-0038

FOR

CE OBSIDIAN ENERGY, LLC., OWNER  
BLACK ROCK 1, 2 AND 3 GEOTHERMAL POWER PROJECT  
WELLFIELD MUD SUMPS/CONTAINMENT BASINS  
Salton Sea Known Geothermal Resource Area (KGRA) - Imperial County

Location of Discharge: Well field associated with Black Rock Salton Sea KGRA

**A. GENERAL MONITORING**

1. The reporting responsibilities of the discharger are specified in the California Water Code. This self-monitoring program is issued in accordance with Specification No. A.15 of Regional Board Order R7-2011-0038. 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 (CE Obsidian Energy, LLC) in the prevention and abatement of pollution arising from the discharge.
  - c. To conduct soil analyses.
2. All sampling methods not specified below or in the Monitoring and Reporting Program shall be conducted in accordance with United States Environmental Protection Agency approved procedures. Analyses shall be conducted by a laboratory certified by the California Department of Public Health to perform the required analyses, unless a field analysis is specified.
3. The California Energy Commission, Compliance Project Manager (CPM), in consultation with the Regional Board Executive Officer, may alter the monitoring parameters and/or the monitoring frequency during the course of this monitoring program.
4. 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.
5. Each report shall contain this 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 a fine and imprisonment for knowing violations."

6. A duly authorized representative of the CE OBSIDIAN ENERGY, LLC, may sign the documents if:
  - a. The authorization is made in writing by the Discharger;
  - b. The authorization specifies an individual or person responsible for the overall operation of the regulated disposal system; and
  - c. The written authorization is submitted to the CPM, with copies to the Regional Board Executive Officer.

## 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 is quarterly. An annual report, which is a summary of all monitoring collected during the previous year, shall also be submitted to both the CPM and the Region Board. The submittal dates for each reporting period shall be as follows:

### 1. Quarterly Monitoring Reports

- a. 1<sup>st</sup> Quarter (January 1 through March 31)..... report due April 15
- b. 2<sup>nd</sup> Quarter (April 1 through June 30)..... report due July 15
- c. 3<sup>rd</sup> Quarter (July 1 through September 30)..... report due October 15
- d. 4<sup>th</sup> Quarter (October 1 through December 31).... report due January 15

### 2. Annual Summary Report

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

## C. REPORTS TO BE FILED WITH THE BOARD

Written Quarterly Reports shall be submitted four times per year, 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. Quarterly Report Requirements

#### a. General Information

1. Letter of Transmittal – A letter transmitting the essential points shall accompany each report. Such a letter shall include a discussion of any violation 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 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.

2. 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 Quarterly report. The summary shall include estimated volumes of liquid or solids that have spilled outside containment, and a description of the management practices addressing each spill or leak occurring during the reporting period. The reportable quantity for liquid is 150 gallons, or more, of geothermal brine, or cooling tower condensate.

b. Monitoring of Mud Sumps/Containment Basins

1. Volume of solids discharged into each mud sump/containment basin during reporting period.
2. Volume of waste from all mud sumps/containment basins shipped to an offsite waste management facility during reporting period. Name and location of waste management facility.
3. Description of sampling equipment and methods implemented during monitoring.
4. For each mud sump/containment basin receiving solids during reporting period, collect one discrete sample of discharged solids, and analyze for:

<u>Constituent</u>	<u>Unit</u>	<u>Sample Type</u>
Heavy Metals (Title 22)	mg/kg	Grab
Total Petroleum Hydrocarbons (TPH)	mg/kg	Grab

5. Description of general conditions of mud sumps/containment basins including any observation of erosion or plant growth.
6. Description of any construction or maintenance done to mud sumps/containment basins.

2. Annual Summary Report

The discharger shall submit an annual report by March 15<sup>th</sup> of the following year to the CPM, with copies to the Regional Board covering the previous monitoring year. The reporting period ends December 31<sup>st</sup> of each year. This report shall contain:

- a. All monitoring data, presented in tabular form, obtained during the previous four Quarters.
- 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 Waste Discharge Requirements.

- c. A written summary of solid waste analyses.

### 3. Contingency Reporting

- a. The discharger shall report to the CPM and the Regional Water Board by telephone any spill of reportable quantity within 48 hours after it is discovered. The reportable quantity for geothermal brine and cooling tower condensate at this facility is 150 gallons. Any other type of spill, regardless of type or size, is to be reported within 48 hours.

After reporting a spill, a written report shall be filed with the CPM, with copies to the Regional Board within seven 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 (all pertinent observations and analyses including quantity, duration, etc.).
- b. If either the discharger or the CPM, in consultation with the Regional Board determines that there is significant physical evidence of a release, the discharger shall immediately notify the CPM and the Regional Board (or acknowledge the CPM/Regional Board's determination) and shall carry out the requirements of 3.c. below.
  - c. If the discharger concludes that a release has been discovered:
    1. The discharger shall, within 90 days of discovering the release, submit a Revised Report of Waste Discharge to both the CPM and the Regional Board proposing an Evaluation Monitoring Program.
    2. The discharger shall, within 180 days of discovering the release, submit a Preliminary Engineering Feasibility Study to both the CPM and the Regional Board detailing corrective action measures.
  - d. Any time the discharger concludes (or the CPM, in consultation with the Regional Board Executive Officer, concludes) that a solid and/or liquid release has proceeded beyond the facility boundary, the discharger shall so notify all affected persons who either own or reside upon the land impacted.
    1. Initial notification to affected persons shall be accomplished within seven 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.
    2. Subsequent to initial notification, the discharger shall provide updates to all affected persons within seven 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 years. The period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the CPM, in consultation with 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. Result of analysis (including calculations), and the Maximum Detection Limit (MDL) for each analysis.

**SUMMARY OF MONITORING AND REPORTING REQUIREMENTS**

1. The Discharger shall arrange 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. 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 a fine and imprisonment for knowing violations."

3. 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 Executive Officer.

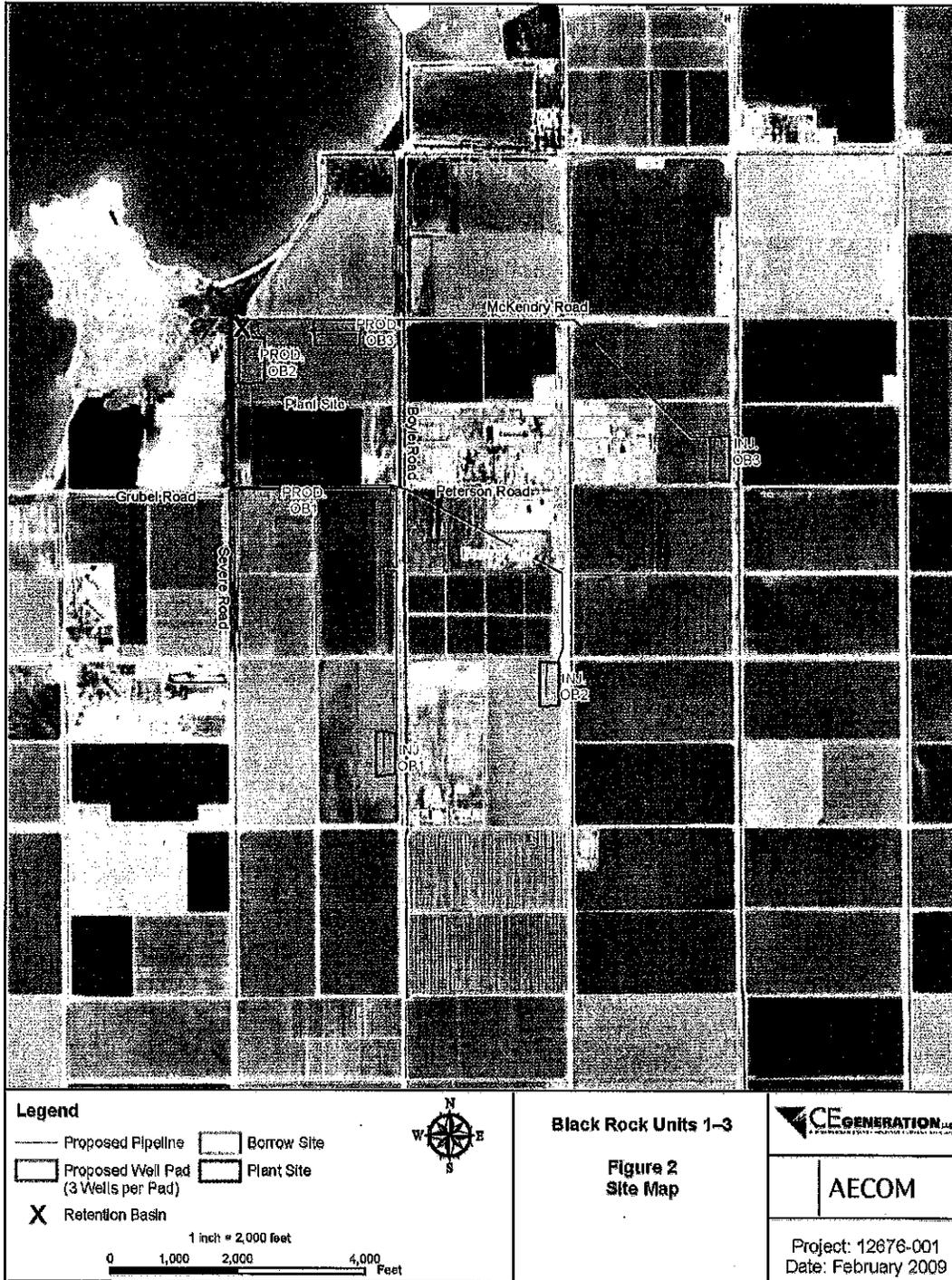
4. Quarterly Monitoring Reports

	<u>Unit</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
a. General Information (C.1.a)			
1. Letter of Transmittal	----	-----	Quarterly
2. Summary of spills	----	-----	Quarterly

- b. Monitoring of Mud Sumps/Containment Basins (C.1.b)
  - 1. Estimate volume of solids discharged to each mud sump/containment basin during quarter      tons      Quarterly      Quarterly
  - 2. Volume of material removed and shipped to waste facility during quarter      tons      Quarterly      Quarterly
- c. Sample solids discharged to basins receiving wastes during reporting period (C.1.b.4)
  - 1. Analyze for Heavy Metals (Title 22 metals)      mg/kg      Quarterly      Quarterly
  - 2. Analyze for Total Petroleum Hydrocarbons (TPH)      mg/kg      Quarterly      Quarterly
- 5. Annual Summary Reports (C.2) shall be submitted to the Regional Board by March 15<sup>th</sup> of the each year, covering the Reporting Period from January 1<sup>st</sup> through December 31<sup>st</sup> of the previous year.
- 6. Contingency Reports Notify immediately by telephone, and submit a written report pursuant to Part C.3.a of this Monitoring and Reporting Program.
- 7. Monitoring Reports Submit all monitoring reports to both the CPM and the Regional Board. Regional Board copies should be sent to:

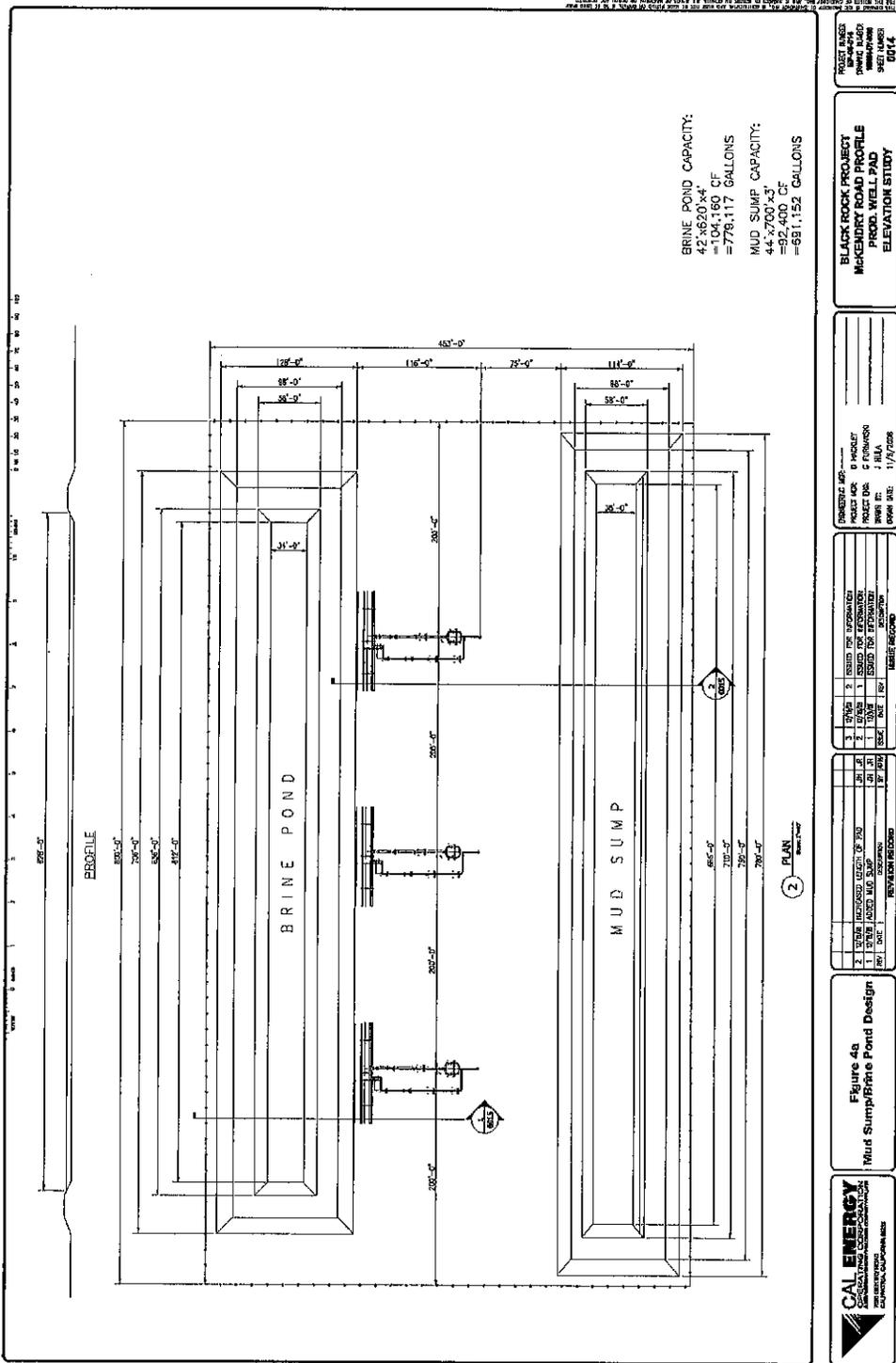
California Regional Water Quality Control Board  
Colorado River Basin Region  
73-720 Fred Waring Drive, Suite 100  
Palm Desert, CA 92260

Ordered by:   
ROBERT PERDUE  
Executive Officer



**ATTACHMENT A**

Black Rock 1, 2 and 3 Geothermal Power Project  
 Mud Sump/Containment Basins  
 Imperial County  
 Board Order **R7-2011-0038**



**ATTACHMENT B**  
 Black Rock 1, 2 and 3 Geothermal Power Project  
 Mud Sumps/Containment Basins  
 Imperial County  
 Board Order R7-2011-0038



**Figure 4a**  
 Mud Sump/Brine Pond Design

NO.	DATE	DESCRIPTION
1	1/15/08	ISSUED FOR INFORMATION
2	1/15/08	ISSUED FOR INFORMATION
3	1/15/08	ISSUED FOR INFORMATION
4	1/15/08	ISSUED FOR INFORMATION
5	1/15/08	ISSUED FOR INFORMATION

NO.	DATE	DESCRIPTION
1	1/15/08	ISSUED FOR INFORMATION
2	1/15/08	ISSUED FOR INFORMATION
3	1/15/08	ISSUED FOR INFORMATION
4	1/15/08	ISSUED FOR INFORMATION
5	1/15/08	ISSUED FOR INFORMATION

NO.	DATE	DESCRIPTION
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4	1/15/08	ISSUED FOR INFORMATION
5	1/15/08	ISSUED FOR INFORMATION

NO.	DATE	DESCRIPTION
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2	1/15/08	ISSUED FOR INFORMATION
3	1/15/08	ISSUED FOR INFORMATION
4	1/15/08	ISSUED FOR INFORMATION
5	1/15/08	ISSUED FOR INFORMATION

PROJECT NO: 0114  
 PROJECT NAME: BLACK ROCK PROJECT  
 PROJECT LOCATION: MCKENDRY ROAD PROJECT  
 PROJECT TYPE: PROVL WELL PAD  
 PROJECT DATE: 1/15/2008