

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

ORDER R7-2015-0022

**WASTE DISCHARGE REQUIREMENTS
FOR
MAGMA POWER COMPANY; VULCAN/BN GEOTHERMAL POWER COMPANY;
AND IMPERIAL MAGMA, LLC, OWNERS
CALENERGY OPERATING CORPORATION, OPERATOR
CALENERGY REGION 2 VULCAN & DEL RANCH (HOCH) POWER PLANTS
CLASS II HOLDING PONDS**

Salton Sea Known Geothermal Resource Area – Imperial County

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

1. CalEnergy Region 2 Vulcan and Del Ranch (Hoch) Power Plants (Region 2 Power Plants) consist of auxiliary buildings and a 92-megawatt geothermal power generating Facility located in the Salton Sea Known Geothermal Resource Area (KGRA), approximately seven (7) miles west of the town of Calipatria at south 1/2, southwest 1/4, southeast 1/4, Section 33, Township 11 South, Range 13 East, San Bernardino Base and Meridian, Imperial County. The location of the Facility is shown on Attachment A attached to and made a part of this Order by reference.
2. The Region 2 Power Plants are located at 7001 Gentry Road, Calipatria and are operated by CalEnergy Operating Corporation, a wholly owned subsidiary of CE Generation, LLC.
3. The Region 2 Power Plants and the property in which the Region 2 Power Plants are located (including the geothermal brine holding ponds) are owned by Magma Power Company and Vulcan BN Geothermal (a subsidiary of Magma Power Company), located at 7030 Gentry Road, Calipatria, CA 92233. These Waste Discharge Requirements provide the regulatory requirements for operation and maintenance of and disposal into the geothermal brine holding ponds.
4. Ownership of properties associated with Region 2 Power Plants geothermal production and injection wells, are as follows:
 - a. Wells DR 10, 11, 12, 14, M6B, M10, M16:

APN 020 110 008	Imperial Magma, LLC
APN 020 110 040	551 W. Main Street, Suite 1
APN 020 110 042	Brawley, CA 92227
 - b. Wells DRIW 01, 02, 03, 08, & Smith
VIW 01, 04, 08:

APN 020 100 047	Robert Bruce Smith, Katherine Lynne
APN 020 120 048	Worrell, David Ray Smith, Leslie O.
	681 Marilyn Lane
	Brawley, CA 92227
 - c. Well MM-18
CalEnergy Holdings, Inc.

551 W. Main Street, Suite 1
Brawley, CA 92227

DEFINITIONS

5. Terms used in this Board Order:
 - a. **Facility** – The entire parcel of property where Region 2 Power Plant industrial operations or related geothermal industrial activities are conducted.
 - b. **Waste Management Unit (WMU)** – The brine holding pond is a WMU.
 - 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 Order refer to CalEnergy Operating Corporation, Magma Power Company, Vulcan BN Geothermal, Imperial Magma LLC and Robert Bruce Smith, Katherine Lynne Smith Worrell, David Ray Smith, Leslie Owen Smith and CalEnergy Holdings, Inc.

PREVIOUS BOARD ORDERS

6. The Facility is currently operating under Order R7-2009-0028. Prior to adoption of Order R7-2009-0028 the Facility had two separate orders. The following list historical Orders for the Facility:
 - a) South Pond (previously called Vulcan Facility): The first Board Order (91-054) for the Vulcan Facility was adopted in November 1991 and a second Board Order (94-083) was adopted in September 1994. Board Order R7-2003-0126 combined and updated Board Order 91-054 and 94-054 to comply with applicable provisions of Title 27 of the California Code of Regulations.
 - b) North Pond (previously called Del Ranch Facility): The first Board Order (91-051) for the Del Ranch Facility was adopted in November 1991 and a second Board Order (92-031) was adopted in May 1992. Board Order R7-2003-0078 combined and updated Board Order 91-051 and 92-031 to comply with applicable provisions of Title 27 of the California Code of Regulations.
7. Board Orders R7-2003-0126 and R7-2003-0078 were updated and combined under Order R7-2009-0028 to include recently installed background and compliance wells for the existing brine holding ponds. The combined facilities are now referred to as the Region 2 Power Plants
8. Order R7-2009-0028 is being updated to comply with current laws and regulations, as set forth in the California Water Code and the California Code of Regulations, and to document any changes to the Facility or operating procedures that could impact groundwater.

BRINE PROCESSING FACILITY AND BRINE PONDS

9. Within the Facility, CalEnergy operates two holding ponds. The northern pond has a capacity of approximately 1,658,400 and the southern pond has a capacity of approximately 807,800 gallons. The holding ponds are used to temporarily retain geothermal brines prior to reinjection and to hold solids that have fallen out of the geothermal brines during the process. The holding ponds are also used to retain geothermal brines and cooling tower blowdown during emergency situations, maintenance operations, spills and water from hydroblasting, portable shower effluent, vehicle wash station effluent, water from the plant conveyance system, and process filtrate from the brine pond filter press (used to dewater solids). The locations of the ponds are shown in Attachment B attached to and made a part of this Order by reference.
10. Brine is routinely piped from the brine ponds back to the clarifier for reuse in the geothermal process. A submersible pump moves the brine from the pond through a piping system to the clarifier where it reenters the process flow. While moving from the pond to the clarifier, the brine passes through a shaker for processing. The shaker uses screens to remove suspended solid particles from the brine. The exiting brine is sent to the clarifier where the material enters the brine processing flow and continues to move through the system where additional solids are removed as filter cake prior to reinjection.
 - a. The raised northern holding pond is lined with 35 mil, XR-5 flexible membrane underlain by one (1) foot of compacted fill (class II millimeter run granular material compacted to 90 percent) and two (2) feet of clay compacted to 80 percent modified Proctor density. The liner is covered with two (2) feet of cement-stabilized sand compacted to 90 percent modified Proctor density for protection from physical damage.
 - b. A Leak Detection System (LDS) is located beneath the membrane liner in the northern holding pond, and consists of five (5) perforated, four (4) inch diameter pipes emplaced in gravel and vented to the side of the pond by three (3) inch diameter PVC pipes. The perforated line drains to test well sumps with riser pipes outside the pond. The sumps are numbered TW-1, TW-2, TW-3, TW-4, and TW-5. The sumps are inspected quarterly to observe if brine is collecting in the LDS due to a breach of the membrane liner.
11. The southern holding pond is lined with 45-mil. Hypalon flexible membrane underlain by one (1) foot of compacted fill (class II mill run granular material compacted to 90 percent). The liner is covered with one (1) foot of cement-stabilized sand compacted to 90 percent at the bottom. The sides of the basin are covered with one (1) foot of cement-stabilized sand.
 - a) In 2007, a new lining system was added on top of the existing southern holding pond. The new lining system was constructed with a new composite lining system providing primary, secondary and tertiary containment of the fluids placed in the Pond. The composition of each of the new composite lining system consists of layers from top to bottom as follows: six (6) inch fiber-reinforced concrete operations layer, six (6) inch protective buffer soil layer, 80 mil primary flexible membrane liner leak detection and removal layer, 80 mil secondary flexible membrane liner, geosynthetic clay liner.
 - b) A Leak Detection System (LDS) is located beneath the primary flexible membrane liner in the southern holding pond. A layer of HDPE Hyper-net, a grid-like material, allows any

leakage by the primary flexible membrane liner to be collected and directed to the leak detection and removal system. The LDS monitoring well is named LDS-1. The well is inspected quarterly to observe if brine is collecting in the LDS due to a breach of the membrane liner.

12. A conveyance system is located underfoot throughout both plants to collect wastewater generated from plants cleanups and washdowns. The conveyance system is concrete lined and covered by an open grate. Wash-down water is discharged through the conveyance system to the brine holding ponds.
13. The Region 2 Power Plants use steam from the hot (450° to 500° F) geothermal brines extracted from 2,500 to 9,500 feet below ground surface to turn turbines that produce electricity.
14. The Facility wellfield consists of production and injection wells. The well sites typically include the well, the wellhead system, and pipelines.
15. The Facility also contains a Makeup Water Pond to store water from nearby agricultural canals used for cooling towers, as shown on Attachment B.
16. There are no domestic wells within 500 feet of the Facility or well field described in Findings 1 through 4 above.
17. All of the Facility's mud sumps were abandoned pursuant to the Mud Sump Abandonment Plan submitted to the Colorado River Basin Water Board on February 25, 2008. This plan included the abandonment of all CalEnergy Power Plant mud sumps at all of its Facilities. Newly developed technology now allows drilling of geothermal wells without the use of mud sumps. Therefore, no future mud sumps will be developed or used at any of the CalEnergy Facilities.

GEOHERMAL BRINES

18. Geothermal fluids in this portion of the Salton Sea KGRA average 25% (by weight) dissolvable solids. These fluids may be classified as hazardous in accordance with the criteria listed in Section 66261.20, Title 22 of the California Code of Regulations. However, the geothermal fluids are not required to be managed as hazardous waste under Title 22 because they are exempt from regulations as hazardous waste by California Health & Safety Code section 25143.1, subdivision (a), which provides: "Any geothermal waste resulting from drilling for geothermal resources is exempt from the requirements of this chapter because the disposal of these geothermal wastes is regulated by the California Regional Water Quality Control Boards."
19. Solids collected in the holding pond are known to have elevated levels of lead (Pb) and arsenic (As). The solids are occasionally removed, and disposed of at appropriate disposal facilities pursuant to federal and state regulations. The solids may be removed by excavators or other equipment directly to storage or transportation containers; through a portable filter press (which dewateres the solids and return the liquid filtrate to injections wells or to the brine pond); and or as incidental solids via the Toyo pump and shaker arrangement.

GROUNDWATER MONITORING

20. Data from onsite wells and other CalEnergy wells indicate that groundwater occurs 5 to 15 feet below ground surface, and has a total dissolved solids concentration of about 26,800 mg/L. Natural recharge in this arid region is low. However, millions of acre-feet have been added to shallow aquifers from canal seepage and tiled agricultural drains, which provide a source of relatively freshwater replenishment to the Salton Sea
21. Seven groundwater wells are monitored semi-annually to evaluate for a release to groundwater from the brine pond. The wells numbered MWV-1 through MWV-5 were installed in 2007. Wells MWV-1, MWV-2, MWV-3 and MWV-4 surround the southern pond. Well MWV-5 is approximately 150 east of the southern pond and 150 southeast of the northern pond. Wells MWV-6 and MWV-7 were installed in 2009 and are background wells for the northern pond. Wells MWV-3, MWV-4 and MWV5 are background wells for the southern pond and wells MWV-1 and MWV-2 are compliance wells for the southern pond. Groundwater analytical results for onsite wells obtained in February 2009 indicate that total dissolved solids were present in groundwater at concentrations ranging from 2,030 to 46,800 mg/L. The site is located in close proximity to the Salton Sea. Therefore, groundwater in the area of the Facility has naturally occurring high TDS. The monitoring well locations are shown on Attachment A attached to and made a part of this Order by reference.
22. Monitoring and Reporting Program R7-2015-0022, attached to and made a part of this Order by reference, and the requirement to maintain groundwater monitoring wells is necessary to determine compliance with WDRs, and Facility impacts, if any, to receiving waters.

REGIONAL GEOLOGY

23. The Facility is located within the Salton Trough, a closed basin located below sea level and separated from the Gulf of California by the Colorado River Delta. The Trough is a structural and topographic depression containing thousands of feet of heterogeneous Tertiary and Quaternary aged lacustrine and deltaic sediments associated with the Colorado River delta. The area is tectonically active and has numerous faults associated with the San Andreas Fault Zone. The lowest area of the basin is the Salton Sea at 227 feet below mean sea level.

BASIN PLAN

24. The Water Quality Control Plan for the Colorado River Basin Region of California (Basin Plan), which was adopted on November 17, 1993, and amended on November 16, 2012, designates the beneficial uses of ground and surface waters in this Region.
25. 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."

SURFACE WATER

26. Surface waters in the area of the Facility include the Imperial Irrigation District (IID) irrigation delivery canals and surface drains, the Alamo River, and the Salton Sea.

27. The beneficial uses of surface waters in the Salton Sea KGRA are as follows:

Imperial Valley Drains

- a. Freshwater Replenishment (FRSH)
- b. Water Contact Recreation (RECI)
- c. Noncontact Water Recreation (RECII)
- d. Warm Freshwater Habitat (WARM)
- e. Wildlife Habitat (WILD)
- f. Preservation of Rare, Threatened, or Endangered Species (RARE).

Alamo River

- a. Fresh Water Replenishment (FRSH)
- b. Water Contact Recreation (RECI)
- c. Noncontact Water Recreation (RECII)
- d. Warm Freshwater Habitat (WARM)
- e. Wildlife Habitat (WILD)
- f. Hydropower Generation (POW)
- g. Preservation of Rare, Threatened, or Endangered Species (RARE)

Salton Sea

- a. Aquaculture (AQUA)
- b. Industrial Service Supply (IND)
- c. Water Contact Recreation (RECI)
- d. Noncontact Water Recreation (RECII)
- e. Warm Water Habitat (WARM)
- f. Wildlife Habitat (WILD)
- g. Preservation of Rare, Threatened, or Endangered Species (RARE)

GROUND WATER RESOURCES

28. The USGS undertook a comprehensive study of the water resources of both the Upper and Lower Colorado River in the 1950s and 1960s. The often-cited geohydrologic reconnaissance survey of the Imperial Valley conducted by Loeltz et al. (1975) is one of a series of reports resulting from those USGS studies and is the classic assessment of ground water resources in the area. No substantive change in the geohydrologic conditions of the Imperial Valley ground water resource has subsequently occurred.
29. The Salton Sea is located within the Colorado River Hydrologic Region, as defined by the California Department of Water Resources (DWR 2003). The Project area is located in the Imperial Valley Basin, one of seven groundwater basins in the hydrologic region located adjacent to the Salton Sea. The following discussion of regional groundwater hydrology within the Imperial Valley Basin is from the Salton Sea Ecosystem Recovery Programmatic EIR, (DWR and CDFG 2006).

The Imperial Valley Basin is located south of the Salton Sea and is at the southernmost part of the Colorado Desert (sic) Hydrologic Region. The basin is bounded on the east by the Sand Hills and on the west by the impermeable rocks of the Fish Creek and Coyote Mountains. The basin extends from the Mexicali Valley to the Salton Sea (DWR, 2003). Imperial County is responsible for groundwater management in the Imperial Valley.

Deep exploration boreholes have shown that most of the Imperial Valley Basin is underlain by thick, water-saturated lacustrine and playa deposits overlying older sediments. Perched groundwater exists over much of the basin and is recharged by seepage from irrigated lands and drains (IID and Reclamation, 2002b). The basin has two major aquifers separated by a semi-permeable aquitard (silt and clay lenses) that averages 60 feet thick and reaches a maximum thickness of 280 feet. Average thickness of the upper aquifer is 200 feet with a maximum thickness of 450 feet. The lower aquifer averages 380 feet thick with a maximum thickness of 1,500 feet (DWR, 2003). Studies have indicated that the hydraulic connection is poor between the water within the deeper deposits and that within the upper part of the aquifer (IID and Reclamation, 2002b). Well yields in this area are limited (Loeltz et al., 1975).

The general direction of groundwater movement in the Imperial Valley Basin is from the Colorado River towards the Salton Sea. However, in the southern portion of the basin, a substantial amount of groundwater flows into the Alamo River and, to a lesser extent, the New River (USGS, 2004). Seepage from the All-American Canal and other canals has caused formation of localized perched groundwater. Between the early 1940s and 1960, groundwater levels rose more than 40 feet along the All-American Canal. Seepage from the canal is expected to decrease substantially now that the eastern section of the canal is lined.

Tile drains have been installed by IID to convey shallow groundwater away from the root zone of crops (IID and Reclamation, 2002b). Most of the shallow groundwater, leaching water, or excess irrigation water flows into the drains and New and Alamo rivers. Groundwater levels remained relatively stable within the majority of the basin between 1970 and 1990 because of a constant rate of discharge from canals and subsurface agricultural drains.

The San Andreas and Algodones faults do not appear to impede or control groundwater movement, based on review of groundwater levels in the 1960s (Salton Sea Authority, 1999).

Hely et al. (1966) estimated the groundwater discharge to the Salton Sea to be less than 2,000 acre-feet a year and IID and Reclamation (2002a) have estimated this value to be about 1,000 acre-feet a year. The IID estimate of 1,000 acre-feet a year (AFY) has been adopted as a reasonable estimate of historical groundwater discharge to the Salton Sea from the Imperial Valley. It was developed using a method that was consistent with the hydrological assumptions used in the Draft Programmatic Environmental Impact Report (PEIR) and it represents a period of time after the groundwater elevation became stable in the 1970s.

Groundwater quality varies extensively in the Imperial Valley Basin. Total dissolved solids, a measure of salinity, ranged from 498 to 7,280 mg/L when measured by DWR in 2003. High concentrations of fluoride have also been reported by IID and Reclamation (2002b).

Due to the low yield and poor water quality, few production wells have been drilled in the Imperial Valley. Most of the wells in the Imperial Valley are domestic wells. Total production from these wells is estimated to be a few thousand acre-feet a year (Salton Sea Authority, 1999).

Extremely deep groundwater has been developed along the southern Salton Sea shoreline for geothermal resources. These wells access non-potable groundwater from several thousand feet below ground surface.

30. The amount of usable near-surface groundwater in the central Imperial Valley is unknown, but this resource has not been significantly exploited because of low well yields and poor chemical quality. The upper 500 feet of fine-grained deposits in the central portion of the Imperial Valley are estimated to have a transmissivity of less than 10,000 gallons per day. Even lower permeabilities are estimated to occur at greater depths (Westec 1981), and low vertical permeability inhibits mixing of waters from different depths such as between the shallow aquifer system and underlying deeper groundwater that includes the geothermal resources.
31. The main source of groundwater recharge to the shallow aquifer system, and likely to a lesser extent to the deeper aquifer, is imported Colorado River water that seeps from canals and is applied as irrigation water to cultivated areas. Shallow groundwater, ranging in depths from about 5 to 20 feet, is drained by an extensive network of ditches and drains in agricultural areas and also discharges into the Alamo and New Rivers that drain toward and into the Salton Sea.

CLIMATE

32. The Facility is located in a desert environment in the northern part of Imperial Valley. The climate is characterized by hot summers and mild winters. Precipitation averages 2.5 to 3.0 inches per year, and surface evaporation averages 100 inches per year.

CEQA

33. In accordance with Section 15301, Chapter 3, Title 14 of the California Code of Regulation, the issuance of these WDRs, which govern the operation of an existing Facility involving negligible or no expansion of use beyond that previously existing, is exempt from the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.)

ABANDONMENT

34. The projected life of the Project is unknown. However, at the end of the useful life of the Project, equipment and facilities will be properly abandoned.
35. The geothermal wells will be abandoned in conformance with the well abandonment requirements of the CDOGGR. Abandonment of a geothermal well involves plugging the well bore with clean drilling mud and cement sufficient to ensure that fluids will not move across into different aquifers. The well head (and any other equipment) will be removed, the casing cut off at least six feet below ground surface, and the well site reclaimed.
36. At the end of power plant operations, the Discharger will prepare and implement a Site Abandonment Plan in conformance with Regional Water Quality Control Board, Colorado River Region, Imperial County and CDOGGR requirements. The Plan will describe the proposed abandonment of the brine pond, monitoring wells, equipment dismantling and site restoration program in conformance with State and County requirements. Typically, above-ground equipment will be dismantled and removed from the site. Some below ground facilities may be abandoned in place. Above ground structures, such as the office and warehouse, may be left in place if approved by the County. The surface of the site will then be restored to conform to approximate pre-Project land uses (or any changes in use approved by a regulatory agency, such as those uses authorized under Land Use Covenants that came into effect during the operation of the land by CalEnergy).
37. A closure/post-closure maintenance plan, including financial assurance, will be provided and implemented prior to the abandonment of the brine pond and onsite monitoring wells. The closure/post-closure maintenance plan will be submitted to the Colorado River Basin Water Board Executive Officer for approval prior to any abandonment activities.

CLEAN WATER ACT

38. It is the policy of the State of California that every human being has the right to safe, clean affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring the Dischargers to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.

NOTIFICATION

39. The Colorado River Basin Water Board has notified the Discharger and all known interested agencies and persons of its intent to update WDRs for said discharge and has provided them with an opportunity for a public meeting, and an opportunity to submit comments.
40. The Colorado River Basin Water Board, in a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, that Order R7-2009-0028 is rescinded, except for enforcement purposes, and that in order to meet provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, the Discharger shall comply with the following:

A. 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. The Discharger shall maintain the seven (7) onsite groundwater monitoring wells (MWV-1 through MWV-7) in good working order at all times. Well maintenance may include periodic well re-development to remove sediments.
3. The geothermal brine holding pond is permitted to receive only the following waste streams:
 - a. Geothermal brine and brine precipitates (solids)
 - b. Wastewater generated from plant cleanups and washdowns discharged via conveyance system
 - c. Cooling tower blow down water
 - d. Portable shower effluent
 - e. Water from hydroblasting
 - f. Vehicle washing station effluent
 - g. Filtrate of brine pond solids dewatering that is being returned to the brine pond from the brine pond filter press operation.

The discharge of waste streams a., b., c., and d. above to an area other than the holding pond is strictly forbidden.

4. Containment of waste shall be limited to the areas designated for such activity. Prior to implementing any revision or modification of the waste containment area, or change in operation that alters the nature and constituents of the waste generated (including annual average volume of waste discharged/stored), the Discharger shall report all pertinent information in writing to the Colorado River Basin Water Board and obtain revised requirements.
5. Two (2) years prior to the anticipated closure of the Facility or any portion thereof, the Discharger shall submit, for review and approval by the Colorado River Basin Water Board Executive Officer, a closure plan in accordance with Section 21769 of Title 27.
6. The closure plan shall at a minimum include:

- a) Facility location map;
 - b) Topographic maps;
 - c) Current monitoring and control systems;
 - d) Land uses;
 - e) Estimated closure date and schedule;
 - f) General closure description;
 - g) Other special requirements;
 - h) Revised closure cost estimates; and
 - i) Any other applicable requirements as specified in Title 27.
7. The Discharger shall notify the Colorado River Basin Water Board Executive Officer at least 180 days prior to beginning any partial or final closure activity of the brine pond.
 8. The Discharger shall furnish, under the penalty of perjury, technical monitoring program reports, submitted in accordance with the specifications requested by the Colorado River Basin Water Board Executive Officer. Such specifications are subject to periodic revision as may be warranted.
 9. This Order is subject to Colorado River Basin Water Board review and update, to comply with any change in state or federal laws, regulations, policies or guidelines.
 10. Prior to the use of new chemicals for control of microbes, pH, scale, and corrosion of cooling tower water and/or geothermal brine, the Discharger shall request review and approval by the Colorado River Basin Water Board Executive Officer in writing, and obtain revised requirements.
 11. Fluids and brine precipitates discharged to and/or contained in the holding pond shall not overflow the pond: All ponds shall be designed and operated to maintain a minimum freeboard of two (2) feet at all times and freeboard shall be utilized for wake and waves of fluid motion, and emergency or natural disaster purposes only.
 12. 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.
 13. Final disposal of residual waste from brine pond cleanouts shall be accomplished to the satisfaction of the Colorado River Basin Water Board Executive Officer.
 14. The brine holding pond shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods having a predicted frequency of once in 100 years.
 15. The following liquid wastes shall be fully contained discharged into metal tanks, or containers approved by the Colorado River Basin Water Board Executive Officer to receive this discharge:
 - a. geothermal well clean out fluid,
 - b. test and production fluid, and
 - c. production and injection well startups and cleanouts

- Geothermal brines may be returned to the geothermal resource via reinjection.
16. Prior to the removal of solids accumulating in the concrete cooling tower basins, an analysis of the material must be conducted and the material must be disposed of in a manner consistent with that analysis and applicable laws and regulations.
 17. Conveyance systems throughout the plant area shall be cleaned at least every 90 days to prevent the buildup of solids, or when activity at the site creates the potential for release of solid materials from the conveyance systems.
 18. Pipe maintenance and de-scaling activities that include hydroblasting or sandblasting shall be performed in a designated area to prevent wastes generated from these activities from impacting the environment. The areas selected for this activity, and handling and disposal of wastes generated, are subject to review and approval by the Colorado River Basin Water Board Executive Officer. The areas currently selected for these activities have been reviewed and approved by the Executive Officer. Water from the hydroblasting process shall be conveyed to the holding pond for injection into the geothermal resource, unless otherwise directed by the Executive Officer.
 19. Public contact with wastes containing geothermal fluids shall be precluded through such means as fences, signs, or other acceptable alternatives.
 20. The surface impoundment shall be managed and maintained to ensure its effectiveness; in particular:
 - a. erosion control measures shall be implemented to ensure small coves and irregularities are not created, and
 - b. solid material shall be removed in a manner that does not damage or compromise the integrity of the liner, or any component of the containment system.
 21. Ninety days prior to terminating discharge operations, the Discharger shall submit a work plan for review and approval by the Colorado River Basin Water Board Executive Officer to determine the extent (if any) of contamination to natural geological materials and groundwater by the waste. One hundred twenty days following work plan approval, the Discharger shall submit a technical contamination assessment report. A California Registered Civil Engineer or Certified Engineering Geologist shall prepare the work plan and technical contamination assessment report.
 22. Upon ceasing operation at this 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. After removal of all wastes, the Discharger shall request an inspection and approval by the Colorado River Basin Water Board Executive Officer in writing.
 23. The Discharger shall maintain, and update every five (5) years, the established irrevocable bond for closure in an amount deemed acceptable to the Colorado River Basin Water Board Executive Officer, or provide other means to ensure financial

- security for closure. The amount of the bond may be changed to reflect updated closure costs adjusted for inflation at the discretion of the Executive Officer.
24. Surface drainage from tributary areas or subsurface sources shall not contact or percolate through wastes discharged at this site.
 25. The Discharger shall use the constituents listed in Monitoring and Reporting Program R7-2015-0022 and revisions thereto as "Monitoring Parameters."
 26. The Discharger shall implement the attached Monitoring and Reporting Program R7-2015-0022 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 brine or waste discharges to the holding pond.
 27. The Discharger shall follow the Water Quality Protection Standard (WQPS) for detection monitoring established by the Colorado River Basin Water Board. The following are parts of the WQPS as established by the Colorado River Basin Water Board Executive Officer:
 - a. The Discharger shall test for the monitoring parameters and the Constituents of Concern (COC) listed in the Monitoring and Reporting R7-2015-0022 and revisions thereto.
 - b. Concentration Limits – for each monitoring point, the concentration limit for each monitoring parameter and constituent of concern (as stated in the Detection Monitoring Program) shall be its background value as obtained during that reporting period.
 - c. The monitoring point of compliance wells are MWV-1 and MWV-2. The background wells are MWV-3 through MWV-7. These monitoring points were approved based on the calculated groundwater gradient at the site. A revised Monitoring and Reporting Program may be required if the groundwater gradient changes. All current and revised monitoring points must be approved by the Colorado River Basin Water Board Executive Officer.
 28. The Discharger shall report test results to the Colorado River Basin Water Board for Monitoring parameters listed in Monitoring and Reporting Program R7-2015-0022, and future revisions thereto. Monitoring parameters and COCs are subject to the most appropriate statistical or non-statistical test under Monitoring and Reporting Program R7-2015-0022, Part III A, and any revised Monitoring and Reporting Program approved by the Colorado River Basin Water Board Executive Officer.
 29. Water used for the process, dust control, and site maintenance (plant cleanup) shall be limited to the least amount necessary.
 30. The Discharger shall not cause or permit the release of pollutants or waste constituents in a manner that may cause or contribute to a condition of contamination, nuisance, or pollution to occur.

B. Prohibitions

1. The discharge of solid geothermal waste (i.e., brine particulates or precipitates) to the brine pond as a final form of disposal is prohibited.
2. The Discharger is prohibited from discharging, treating or composting the following wastes:
 - a. Municipal solid waste;
 - b. Sludge (including sewage sludge, water treatment sludge, and industrial sludge);
 - c. Septage;
 - d. Liquid waste, unless specifically approved by this Order or by the Colorado River Basin Water Board Executive Officer;
 - e. Oily and greasy liquid waste; unless specifically approved by this Order or by the Colorado River Basin Water Board Executive Officer;
 - f. Hot, burning waste materials or ash.
 - g. Brine pond filter cake. Brine pond filter cake must be discharged at an appropriate disposal facility pursuant to federal and state regulations.
3. The Discharger shall not cause degradation of the designated beneficial uses of any groundwater aquifer or water supply.
4. The discharge of waste to land not owned or controlled by the Discharger is prohibited.
5. Use of geothermal fluids or cooling tower liquids for dust control on access roads, well pads, or other locations is prohibited.
6. The discharge of hazardous or designated waste to an area other than waste management units authorized to receive such waste is prohibited.
7. The direct or indirect discharge of wastes to surface water or surface drainage courses is strictly prohibited. Holding pond fluids shall not enter canals, or surface (and subsurface) drains.
8. As a Class II Surface Impoundment the brine pond must be maintained to assure that wastes are a minimum of two feet above the highest anticipated elevation of underlying groundwater.
9. The Discharger shall neither cause nor contribute to the contamination or pollution of ground or surface water via the release of waste constituents in solid, liquid, or gaseous phase.

10. The Discharger shall not cause the concentration of any Constituent of Concern or Monitoring Parameter to exceed its respective background value in any monitored medium at any Monitoring Point assigned for Detection Monitoring pursuant to Monitoring and Reporting Program R7-2015-0022.

C. Provisions

1. The Discharger shall comply with Monitoring and Reporting Program R7-2015-0022 and future revisions thereto, as specified by the Colorado River Basin Regional Water Quality Control Board Executive Officer.
2. Unless otherwise approved by the Colorado River Basin Water Board Executive Officer, sample collection, storage, and analysis shall be performed according to the most recent version of Standard USEPA methods, and California Environmental Laboratory Accreditation Program (ELAP) rulings. Water and waste analysis shall be performed by a laboratory approved for these analyses by the State Water Resources Control Board Division of Drinking Water. Specific methods of analysis must be identified. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and approval by the Colorado River Basin Water Board Executive Officer prior to use. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Colorado River Basin Water Board. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurement.
3. The laboratory shall use the lowest obtainable reporting limits for groundwater samples required by the monitoring.
4. Prior to any change in ownership of this operation, the Discharger shall transmit a copy of this Order to the succeeding owner/operator, and forward a copy of the transmittal letter to the Colorado River Basin Water Board.
5. Prior to a modification that results in material change in the quality or quantity of waste discharge, or a material change in the location of waste discharge, the Discharger shall report all pertinent information in writing to the Colorado River Basin Water Board Executive Officer and obtain revised requirements.
6. All permanent containment structures, and erosion and drainage control systems, shall be certified by a California Registered Civil Engineer or Certified Engineering Geologist to meet prescriptive standards and performance goals.
7. The Discharger shall ensure that all site-operating personnel are familiar with the content of this Board Order, and shall maintain a copy of this Board Order at the site.
8. The Board Order does not authorize violation of any federal, state, or local laws or regulations.
9. The Discharger shall allow the Colorado River Basin Water Board, or an authorized representative, upon presentation of credential and other documents required by law, to:

- a. Enter the premises regulated by this Board Order, or the place where records are kept under the conditions of this Board Order;
 - b. Have access to and copy, at reasonable times, records kept under the condition of this Board Order;
 - c. Inspect at reasonable times, facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Board Order; and
 - d. Sample or monitor at reasonable times, for the purpose of assuring compliance with this Board Order or as otherwise authorized by the California Water Code, any substance or parameter at this location.
10. The Discharger shall comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Porter-Cologne Water Quality Act, and is grounds for enforcement action.
11. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) installed or used by the Discharger to achieve compliance with this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures.
12. This Order does not convey property rights of any sort, or any exclusive privilege, nor does it authorize injury to private property, or invasion of personal rights, nor infringement of federal, state, or local laws or regulations.
13. 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 (i.) records of all monitoring information, (ii.) copies of all reports required by this Board Order, and (iii.) records of all data used to complete the application for this Board Order, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by the Colorado River Basin Water Board Executive Officer.
 - c. Records of monitoring information shall include:
 1. The date, exact place, and time of sampling or measurement;
 2. The individual performing the sampling or measurement;
 3. The date analysis is performed;
 4. The individual responsible for reviewing the analysis; and
 5. The result of the analysis.
 - d. Monitoring shall be conducted according to test procedures described in the Monitoring and Reporting Program, unless other test procedures have been specified in this Order, or approved by the Colorado River Basin Water Board Executive Officer.

14. Monitoring systems shall be readily accessible for sampling and inspection.
15. The Discharger is responsible for the WDRs, and Monitoring and Reporting Program for the Facility. The Discharger shall comply with all conditions of the WDRs. Violations may result in enforcement action, including Colorado River Basin Water Board or court orders requiring corrective action or imposing civil monetary liability, or modification or revocation of WDRs by the Colorado River Basin Water Board.
16. The Discharger shall furnish, under penalty of perjury, technical monitoring program reports. Such reports shall be submitted in accordance with specifications provided by the Colorado River Basin Water Board Executive Officer. Such specifications are subject to periodic revision as warranted.
17. The Discharger may be required to submit technical reports as directed by the Colorado River Basin Water Board Executive Officer.
18. Procedures for preparing samples for analysis shall be consistent with Monitoring and Reporting Program R7-2015-0022, and revisions thereto. Monitoring reports shall be certified to be true and correct, and signed, under penalty of perjury, by an authorized official of the company.
19. All monitoring shall be conducted pursuant to Title 27 of the California Code of Regulations.
20. The Discharger shall furnish, under penalty of perjury, technical monitoring program reports, and such reports shall be submitted according to Chapter 30, Division 3, Title 23 of the California Code of Regulations, as data uploads and in Portable Document Format (PDF) electronically over the internet into the State Water Board's GeoTracker database. The Facility is identified in the GeoTracker by the global identification number L10003292609 and in the California Integrated Water Quality Systems (CWIQS) by waste discharge identification (WDID) No. 7A 13 2040 014.

I, Robert Perdue, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the Colorado River Basin Water Board on June 11, 2015.

original signed by
Executive Officer

Date