

**DOCKETED**

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| <b>Docket Number:</b>   | 79-AFC-04C                                                                      |
| <b>Project Title:</b>   | Compliance - Application for Certification of DWR Bottlerock Geothermal Project |
| <b>TN #:</b>            | 262316                                                                          |
| <b>Document Title:</b>  | Appendix 2 Compiled Part 1                                                      |
| <b>Description:</b>     | N/A                                                                             |
| <b>Filer:</b>           | John C Casteel                                                                  |
| <b>Organization:</b>    | Mayacma Geothermal LLC                                                          |
| <b>Submitter Role:</b>  | Applicant                                                                       |
| <b>Submission Date:</b> | 3/24/2025 5:07:36 PM                                                            |
| <b>Docketed Date:</b>   | 3/24/2025                                                                       |



**2024 CEC INTERIM CONDITIONS OF COMPLIANCE REPORT**  
**MAYACMA GEOTHERMAL LLC**

**Appendix 2**

***Current Year LCAQMD Authorities to Construct and  
Permits to Operate***

***GAMP Participation – Proof of Payment***



# PERMIT TO OPERATE

## Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 2010-09

By: Douglas G. Gearhart  
Douglas G. Gearhart, APCO

Type of Issuance: Renewal Issuance Date: 10/31/2024 Valid through: 10/31/2025 Category: VIb

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Susan Petty  
Owner: Bottle Rock Power, LLC  
Mailing: c/o AltaRock Energy, Inc.  
Address: P.O. Box 31205  
Seattle, WA 98103-8099

Facility: Bottle Rock Power Plant  
Location: 7557 High Valley Rd., Cobb, CA.  
Sec 5, T11N, R8W, MDB&M Lake County  
Francisco/Coleman Leasehold

### Name and Equipment Description: Bottle Rock Power Plant

One (1) fifty-five (55) megawatt geothermal power plant with abatement equipment installed and operated as described in conditions attached to the Modified Determination of Compliance dated February 22, 1982. Two (2) mechanical vacuum pumps of 50% capacity to the surface condenser non-condensable gas removal systems. Equipment piping and valves on AECS for Stretford Delay Tank skimmer pipe and Oxidizer Tank air spargers. Up to two (2) mercury scrubbing/absorption columns vessels with activated carbon media, associated piping and valves. Condensate H<sub>2</sub>S abatement system (pumps, piping, & valving) including condensate line reroute valving and piping to cooling tower basin; a condensate sparging system in the cooling tower basin; position and/or orientation changes of the distribution header to increase contact time and efficiency, and use of Iron Chelate (Fe•HEDTA) catalyst. Distributed Control System, incorporating a central control system for the steamfield, power plant, and abatement systems with an Allen Bradley Control Logix automated processor.

### Permit Conditions

#### Condition 1: Emissions

- A. The emissions limitations contained below shall apply during normal power plant operation, outages, and/or curtailments. All equipment shall be regularly maintained in good working order and operated in a manner to prevent or minimize air emissions.
- B. Hydrogen sulfide (H<sub>2</sub>S) emissions from the Bottle Rock Power Plant shall be limited to a maximum of five (5) pounds per hour during power plant generation and all outages. All untreated steam or condensate shall be returned to a treatment or re-injection point to ensure this level of emissions is maintained.
- C. The H<sub>2</sub>S content in the sweet gas from the Stretford shall not exceed 10ppmv, prior to dilution in the cooling tower.
- D. The H<sub>2</sub>S concentration from the gland Steam Seal System vent shall not exceed 250 ppmw, and the H<sub>2</sub>S emission rate shall not exceed 0.1 lbs/hr.
- E. Upon failure of the AECS, Bottle Rock Power, LLC (BRP) shall curtail operations to a level necessary to comply with the five (5) lbs/hr H<sub>2</sub>S emissions limitation.
- F. In the event of generalized atmospheric conditions or localized dangerous contamination of such a nature as to constitute an emergency creating a danger to the health and welfare of the citizens of Lake County, the Air Pollution Control Officer (APCO) will take immediate action by requiring BRP to reduce H<sub>2</sub>S or other emissions, or to discontinue emissions entirely.
- G. The off-gas vent to the atmosphere shall not be utilized at any time. The turbine by-pass, mechanical vacuum pumps, or other Lake County Air Quality Management District (LCAQMD) approved method shall be used to avoid direct venting into the atmosphere of undiluted non-condensables. The LCAQMD shall be notified when cold start-ups in excess of five (5) lbs H<sub>2</sub>S/hr are to occur and may cancel such activity if deemed necessary.
- H. The access road from Bottle Rock Road to the power plant shall be paved to ensure that the generation of fugitive particulate matter is minimized. This shall apply to the primary access roads, should the primary access routes change.
- I. The permit holder shall properly install and maintain a properly sized, winterized condensate (cooling tower working water, condensate reroute valving and piping) H<sub>2</sub>S abatement system modification incorporating the availability of an iron chelate (Fe•HEDTA) catalyst, hydrogen peroxide, and other additives as approved by the APCO, to achieve an overall emissions rate specified in this permit.

#### Condition 2: Administrative

- A. Bottle Rock Power (BRP) shall maintain and operate the power plant, Air Emissions Control System (AECS), and associated ancillary equipment as described in submitted specifications and drawings and subsequent permit modifications in accordance with good operating practices and procedures to meet the emissions limit in Condition 1. The power plant and abatement system components shall be adequately maintained and winterized.
- B. The AECS system shall consist of: A) A surface condenser to facilitate the partitioning of H<sub>2</sub>S into the non condensable gas phase; B) A Stretford Abatement System (SAS) as modified to include a 10 inch diameter skimming pipe on the delay tank and two oxidizer tank air spargers and with the ability to return the H<sub>2</sub>S gas treatment components of the AECS operation to the pre-modification operation.; C) Secondary condensate treatment which includes iron chelate and/or other approved secondary abatement chemical, and reaction time to ensure the power plant will comply with the emission limitation specified in Condition #1; D) A turbine by-pass system sufficiently sized to accept 100% of full steam flow during generating outages so that the power plant AECS can be utilized to treat steam normally stacked during the outage; E) If a solids removal system is necessary as a result of solids formation in the condensate, such facility shall be incorporated into the system; F) In the event of generation loss, an alternate source of power to enable continued use of the AECS specified above shall be available; and G) A properly permitted, compliant stand by generator or alternate power supply capable of sustaining station power and the Emergency Stacking System shall be available for use in case of concurrent transmission line and generator failure.
- C. The major components of the AECS, Stretford, Turbine by-pass, and condensate abatement system shall have a 99% operating availability excluding scheduled maintenance on these individual major components.
- D. BRP shall maintain alarms and switches on the following units to ensure immediate corrective action is initiated to prevent outages and potential stacking: **Turbine Generator Unit** – 1) Excessive vibration switch, alarm and trip; 2) Lateral motion switch on the turbine shaft, alarm and trip; 3) High lube oil temperature switch, alarm and trip; 4) Low lube oil pressure switch with indicating light in control room; **Main Lube Oil Reservoir low level, alarm** – 1) Over-speed switch, alarm and trip; 2) High hydrogen gas temperature and low purity hydrogen alarm and trip; 3) Seal oil level switch and alarm; 4) Differential pressure switch to prevent low differential pressure between the seal oil and hydrogen pressure, alarm and trip; 5) Generator moisture detector and alarm; 6) Vacuum switch to prevent low vacuum in the seal oil detaining tank, alarm and trip; 7) Turbine bearing metal temperature alarm and trip; **Condensers** – 1) Pressure switch to prevent condenser pressures from exceeding design levels, alarm and trip; 2) Condensate level switches to start and stop pump, prevent excessively high condensate levels in hot well; 3) High or low condensate levels alarms; **Cooling Towers** – 1) Float indicators to indicate levels and associated low, low-low, high, and high-high alarms; 2) Vibration switches and alarms on each cooling tower fan. **Electrical System** – 1) Generator differential current trip and alarm; 2) Generator over-current trip and alarm; 3) Generator ground fault trip and alarm; 4) Generator anti-motoring trip and alarm; 5) Generator field ground trip and alarm; 6) Generator stator over temperature alarm and trip; 7) Loss of excitation trip and alarm; 8) System negative phase sequence trip and alarm; 9) Transformer differential current trip and alarm; 10) Transformer over-current trip and alarm; 11) Transformer ground fault trip

( Conditions 2 through 6 are continued on the back of this card )

### THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

This permit does not authorize the emission of air contaminants in excess of those allowed by the California Health and Safety Code or the Regulations of the Lake County Air Quality Management District. This permit cannot be considered permission to violate existing laws, ordinances, regulations, or statutes of other government agencies. The provisions of this Permit are severable. If any provision of this Permit is held invalid, the remainder of this Permit shall not be affected thereby.

and alarm; 12) Transformer sudden pressure trip and alarm; 13) Transformer winding temperature alarm; 14) Transformer oil temperature alarm.

E. The power plant abatement system shall have an operator on site at all times. The operator must be able to immediately take necessary corrective action in the event of power plant outage or equipment malfunction in order to meet the conditions of the Determination of Compliance.

F. A) Regarding secondary abatement: BRP shall maintain the ability to control the pH of treated condensate, provide for the oxidation of H<sub>2</sub>S utilizing H<sub>2</sub>O<sub>2</sub> or iron chelate, ensure a residence time of 75 or more seconds and incorporate the ability to add on a catalyst injection capability to the secondary system should operating experience show such is necessary. Chemical storage capacity shall be as specified in the AFC amendments and no less than one (1) weeks supply shall remain on-site at all times. Alternatively, BRP can provide information acceptable to the LCAQMD and ARB establishing pH adjustment and control is not necessary at the power plant or provide temporary facilities (portable) for the injection of NaOH during power plant start-ups.

G. Regarding the turbine by-pass to power plant main condenser system: BRP shall maintain reliable and proven valves, noise attenuation of the valving, and desuperheating of by-passed steam/or account for in the design of the system, the ability to successfully by-pass 100% of the steam load.

H. Should BRP no longer operate the steam field, an agreement between BRP and the steam field operator is required to be filed with the LCAQMD within 60 days. This agreement shall specify with the steam supplier the responsibilities of turbine operations, bypass and emergency stacking abatement systems, as well as the interface between the stacking system controls.

I. The condensate piping and valving servicing the Power Plant and permanent addition of the iron chelate chemical injection system shall be refined and maintained. The condensate reroute and iron chelate addition modifications shall be installed in a manner so as to minimize emissions from the facility by extending the contact time with oxygenated cooling tower basin waters to the maximum extent and consistent with documentation in the application and permit review issuance. Injection of iron chelated catalyst at the cooling tower basin or within the cooling tower circulating water shall be incorporated.

J. The cooling tower shall have a guaranteed drift rate of no more than 0.002% of the circulating water design rate.

K. The unitized automated control and reporting system, "Distributed Control System" (DCS), shall include several levels of redundancies, backup processors, backup power for well head automated valves, and central controls for all power plant, steam field, and abatement system operations.

L. The gas ejectors shall remain operable and available for use in the event of failure of the mechanical vacuum pump.

M. All AECS equipment drain or discharge seal water shall be directed to the rich condensate collection and disposal system.

N. Up to two mercury scrubber vessels shall be maintained in good operating condition between the water knockout and the delay tank. Sulfur product shall be treated as hazardous waste unless analyses prove otherwise.

**Condition 3: Records and Reporting**

A. The LCAQMD shall be notified pursuant to Rule 510, upon breakdown and/or loss of emissions control from this facility. Within one (1) hour following any power plant outage or malfunction resulting in emissions in excess of five (5) pounds per hour H<sub>2</sub>S, BRP shall advise the LCAQMD 1) the cause of the exceed; 2) actions taken or proposed to achieve compliance and 3) estimate of emissions and duration of noncompliance. BRP shall maintain a log of power plant outages along with explanations for the outages and malfunctions. In the event that power plant outages recur because of equipment malfunctions that are not indicated by alarms, BRP shall retrofit alarms on the malfunctioning equipment as possible. The log shall be available for inspection upon the request of the staffs of the LCAQMD, California Air Resources Board (ARB), California Energy Commission (CEC), and Environmental Protection Agency (EPA).

B. Reports shall be issued quarterly to the LCAQMD detailing: A) Hours of operation; B) Any periods for which abatement equipment malfunctioned and the action taken; C) Chemicals utilized for treatment of condensate; D) Periods of scheduled and unscheduled outages and the reasons for such outages; and E) Summary of the output of continuous emissions monitors with explanations of any irregularities.

C. BRP shall furnish the records specified in Condition 3B to the District 15 days upon request, or no later than October 31st of each year.

**Condition 4: Modification**

A. BRP shall submit an application for and receive an Authority to Construct Permit prior to any significant deletions, additions, modifications, or operational changes to the herein permitted power plant support systems and equipment.

**Condition 5: Testing and Maintenance**

A. BRP shall utilize the current LCAQMD approved source testing procedure to determine H<sub>2</sub>S emissions from cooling tower. Should an alternate test method be requested, BRP shall submit a detailed performance test plan to the LCAQMD at least 30 days prior to such tests. BRP shall maintain test plan to determine the particulate emissions rate and components of particulate emitted. If an alternate plan is proposed it must receive LCAQMD and CEC staff approval before such tests may be conducted to determine compliance. The ARB shall arbitrate difference if concurrence on a test procedure cannot be reached between CEC, BRP and the LCAQMD and recommend a binding procedure. Safe sampling access and ports shall be provided to enable the LCAQMD to gather samples from the freshly treated condensate, cooling tower stack and treated gas from the Stretford system.

B. BRP shall take all reasonable measures to comply with any future air emittent or ambient standard or guideline adopted for present non-criteria pollutants (i.e., Mercury, Boron, Arsenic, Radon222, etc.) by responsible State or Federal agencies and comply with guidelines established as part of BRP's certification by the CEC.

C. BRP shall promptly fund appropriate studies as requested by the APCO to ascertain the impact of operations at the residence located approximately 1900 ft east of the Francisco pad, should residents in good faith file complaints with the APCO indicating the air quality is worsening or becoming a nuisance or unhealthful as a result of BRP's operation. These studies shall include, but not be limited to, monitoring at the residence to determine H<sub>2</sub>S levels and particulate or other components which are believed or known to be in geothermal steam, tracer tests or source tests. Such studies shall be approved by the APCO prior to initiation. Reasonable mitigation steps shall be applied upon request of the APCO to attempt to remedy any unlawful impacts caused by the BRPP upon the residence.

D. The incoming steam to the power plant shall be analyzed annually and reported to the LCAQMD for Radon222 and its daughters, Mercury, Arsenic, Silica, Boron, Benzene, Ammonia, and total suspended solids. The results of these tests shall be reviewed by the APCO to determine if continued annual testing will suffice, or if more frequent analysis is necessary. Results of any tests performed upon the cooling tower sludge shall also be forwarded to the LCAQMD.

E. H<sub>2</sub>S emissions shall be monitored continuously by measuring total volume flow rates and H<sub>2</sub>S concentrations at the incoming steam, outlet of the Stretford unit, and in the treated condensate. A log of such monitoring shall be maintained and be made available to LCAQMD staff upon request. Stretford Tail gas monitor output shall be recorded on a continuous paper strip chart recorder or an APCO approved equivalent device. The devices must have accuracies of +1 ppm, provide measurements at least every 15 minutes, and be accessible to LCAQMD staff. Flow rate measuring devices must have accuracies of +/-5% at 40% to 100% of the total flow rate and calibrations must be performed at least quarterly. Calibration records must be made available to LCAQMD staff upon request. Monitoring shall be required pursuant to Section 42303 of the California Health and Safety Code. In the event that acceptable continuous monitors are not available, BRP shall conduct testing no less than once every 30 days to ensure the efficiencies of the H<sub>2</sub>S abatement systems are being maintained. The testing procedure used to determine compliance must be approved by the APCO. A log of such testing shall be maintained and be available to LCAQMD staff upon request. A summary of the monitoring and/or testing shall be forwarded to the LCAQMD every three (3) months.

F. BRP shall operate and maintain an on-site meteorological station capable of determining wind direction, wind speed, standard deviation of the direction, and temperature. Such data shall be immediately available on-site and shall be furnished to the LCAQMD upon request and in quarterly reports coordinated with major emissions events such as Stretford outages, well vents, etc.

G. Compliance monitoring shall be conducted by BRP. Constituents to be monitored include Arsenic, Boron, Mercury, Radon 222, Benzene, Silica, and Particulates in addition to H<sub>2</sub>S. Constituents shall be measured both as suspended aerosols and fall-out. Monthly composite samples of fall-out shall be collected using a wet/dry collector. Constituents other than H<sub>2</sub>S shall be measured per the ARB/EPA sampling method. BRP, CEC, and LCAQMD shall agree upon methods used in sampling and analysis. The monitoring program will be reviewed periodically by the APCO and the feasibility and necessity for continuance determined. The site for such monitoring shall be in the Cobb Valley area unless BRP and the LCAQMD agree upon a mutually acceptable alternative site. If BRP continues to participate in a combined effort with other developers such as the Geysers Air Monitoring Program (GAMP), or an alternative monitoring program acceptable to the LCAQMD and CEC, this condition shall not be exercised except as needed beyond the capabilities of GAMP.

H. BRP shall maintain sampling ports on the influent and effluent sides for each mercury scrubber and measure and report measured efficiency of mercury scrubbing to the LCAQMD. A log shall be maintained of unit maintenance to include dates of media changes and the reason for change out, any events of plugging, and all coincident mercury measurements made in sulfur product. The log shall be forwarded quarterly to the LCAQMD, or provided upon request.

I. Mercury Scrubber equipment shall be operated within supplier/manufacturers specifications. BRP shall continuously monitor the scrubbers for pressure loss utilizing the DCS measurements prior to the delay tank and on the backside of the mechanical pumps, and incorporate alert and maintenance action warning levels prior to generation unit trip due to overpressure or back pressure of scrubbing media, and BRP shall maintain a local gauge on the mercury scrubber to measure pressure drop across the unit. This shall act as a physical backup and check of the DCS measurements.

J. BRP shall cause to be performed tests that establish compliance with permit emissions limitations under anticipated plant and AECS components operating scenarios, consistent with existing facility LCAQMD permits and the DOC. This shall include cooling tower stack source testing as described in Appendix 2 of the permit reviews and the DOC. Planned operating scenarios shall be described in writing, include required emission testing protocols, and be provided the APCO a minimum of two weeks prior to any operational tests or scheduled source testing. To the extent possible, operating scenarios shall identify measurable parameters that can indicate compliance, or the lack thereof to be correlated with cooling tower stack emissions testing. A source test plan consistent with the facility permit requirements to determine H<sub>2</sub>S emissions, for any operating scenario of more than one week duration, shall be provided two weeks prior to testing the scenario. Source tests plans shall be approved by the LCAQMD prior to testing. Required cooling tower stack source testing can be delayed and H<sub>2</sub>O<sub>2</sub> addition presumed unnecessary, unless requested by the APCO, provided all of the following are met: 1) AECS components are available, supplied and operable; 2) The cooling tower basin water has excess available dissolved oxygen and the hot well condensate is directed to the cooling tower basin; 3) Incoming steam is 450 ppmw H<sub>2</sub>S or less; 4) The Fe•HEDTA concentration is 5 ppm or greater in the working water; and 5) Delivered steam to the plant does not exceed 150,000 lbs/hr.

**Condition 6: Identification and Access**

A. BRP shall provide safe access for representatives of the LCAQMD, ARB, or EPA to inspect, review records, or collect samples as approved by the APCO, from this facility. Should the plant be secured by locks or gates, the LCAQMD shall be provided keys, combinations or other means to gain immediate access for purpose of testing or inspection.

B. BRP shall provide a telephone number at which the operator or a representative can be reached to ensure LCAQMD entry for inspection purposes. If for considerations of safety, BRP cannot provide access within one (1) hour of notification/request, BRP shall forward in writing within one (1) week a letter explaining the reasons entry within one (1) hour could not be allowed the LCAQMD staff.



# AUTHORITY TO CONSTRUCT

## Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # A/C 2006-11

By: Douglas G. Gearhart  
Douglas G. Gearhart, APCO

Type of Issuance: Renewal Issuance Date: 10/31/2024 Valid through: 10/31/2025 Category: IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Susan Petty  
Owner: Bottle Rock Power, LLC  
Mailing: c/o AltaRock Energy, Inc.  
Address: P.O. Box 31205  
Seattle, WA 98103-8099

Facility: Coleman Padsite  
Location: 600m N of S, 320m E of W, Section 5, T11N,  
R8W, MDB&M, Lake County  
Coleman Pad, Bottle Rock / Francisco  
Leasehold, Cobb Valley, CA

### Name and Equipment Description: Coleman 1A-5 Re-Drill

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H<sub>2</sub>O<sub>2</sub>; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

### *Permit Conditions*

#### **Condition 1: Emissions**

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H<sub>2</sub>S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H<sub>2</sub>S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H<sub>2</sub>S, BRP agrees to reduce the H<sub>2</sub>S emission limit to two (2) pounds of H<sub>2</sub>S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H<sub>2</sub>S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H<sub>2</sub>S levels are encountered during drilling, BRP will either: 1) Place into operation additional H<sub>2</sub>S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H<sub>2</sub>S means abated emissions greater than five (5) pounds of H<sub>2</sub>S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

#### **Condition 2: Administrative**

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H<sub>2</sub>S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam and a converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the

( Conditions 2 through 6 are continued on the back of this card )

### **THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION**

This permit does not authorize the emission of air contaminants in excess of those allowed by the California Health and Safety Code or the Regulations of the Lake County Air Quality Management District. This permit cannot be considered permission to violate existing laws, ordinances, regulations, or statutes of other government agencies. The provisions of this Permit are severable. If any provision of this Permit is held invalid, the remainder of this Permit shall not be affected thereby.

converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review. 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored. 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD. 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.

F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

### Condition 3: Notification

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.

B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.

C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.

D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.

E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

### Condition 4: Modification/Additions

A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

### Condition 5: Monitoring and Testing

A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE\*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in  $\mu\text{g}/\text{Kg}$  of steam); Asbestos (fibers/ $\text{Kg}$  of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. \*Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.

B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.

C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

D. BRP shall install and utilize an in-line continuous H<sub>2</sub>S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.

F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.

G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).

H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H<sub>2</sub>S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H<sub>2</sub>S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.

I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

### Condition 6: Identification and Access

A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.

B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.



# AUTHORITY TO CONSTRUCT

## Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # A/C 2006-05

By: Douglas G. Gearhart  
Douglas G. Gearhart, APCO

Type of Issuance: Renewal

Issuance Date: 10/31/2024

Valid through: 10/31/2025

Category: IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Susan Petty  
Owner: Bottle Rock Power, LLC  
Mailing: c/o AltaRock Energy, Inc.  
Address: P.O. Box 31205  
Seattle, WA 98103-8099

Facility: Coleman Padsite  
Location: 600m N of S, 320m E of W, Section 5, T11N,  
R8W, MDB&M, Lake County  
Coleman Pad, Bottle Rock / Francisco  
Leasehold, Cobb Valley, CA

### Name and Equipment Description: Coleman 3-5 Re-Drill

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H<sub>2</sub>O<sub>2</sub>; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

### *Permit Conditions*

#### **Condition 1: Emissions**

- A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H<sub>2</sub>S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H<sub>2</sub>S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H<sub>2</sub>S, BRP agrees to reduce the H<sub>2</sub>S emission limit to two (2) pounds of H<sub>2</sub>S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H<sub>2</sub>S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.
- B. If excessively high H<sub>2</sub>S levels are encountered during drilling, BRP will either: 1) Place into operation additional H<sub>2</sub>S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H<sub>2</sub>S means abated emissions greater than five (5) pounds of H<sub>2</sub>S per hour or abated emission levels in excess of 500 ppmv.
- C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.
- D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.
- E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

#### **Condition 2: Administrative**

- A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.
- B. The submitted BRP (Tecton) H<sub>2</sub>S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.
- C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.
- D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.
- E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam and a converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the

( Conditions 2 through 6 are continued on the back of this card )

### **THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION**

This permit does not authorize the emission of air contaminants in excess of those allowed by the California Health and Safety Code or the Regulations of the Lake County Air Quality Management District. This permit cannot be considered permission to violate existing laws, ordinances, regulations, or statutes of other government agencies. The provisions of this Permit are severable. If any provision of this Permit is held invalid, the remainder of this Permit shall not be affected thereby.

converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review. 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored. 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD. 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.

F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

### Condition 3: Notification

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.

B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.

C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.

D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.

E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

### Condition 4: Modification/Additions

A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

### Condition 5: Monitoring and Testing

A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE\*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in  $\mu\text{g}/\text{Kg}$  of steam); Asbestos (fibers/ $\text{Kg}$  of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. \*Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.

B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.

C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

D. BRP shall install and utilize an in-line continuous H<sub>2</sub>S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.

F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.

G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).

H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H<sub>2</sub>S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H<sub>2</sub>S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.

I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

### Condition 6: Identification and Access

A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.

B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.



# PERMIT TO OPERATE

**Lake County Air Quality Management District**  
2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 85-034A

By: Douglas G. Gearhart  
Douglas G. Gearhart, APCO

Type of Issuance: Renewal Issuance Date: 10/31/2024 Valid through: 10/31/2025 Category: IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Susan Petty  
Owner: Bottle Rock Power, LLC  
Mailing: c/o AltaRock Energy, Inc.  
Address: P.O. Box 31205  
Seattle, WA 98103-8099

Facility: Coleman Padsite  
Location: 600m N of S, 320m E of W, Section 5, T11N,  
R8W, MDB&M, Lake County  
Coleman Pad, Bottle Rock / Francisco  
Leasehold, Cobb Valley, CA

**Name and Equipment Description: Coleman 4-5**

One (1) geothermal production well, associated valving, condensate and rock removal (catcher), and bleed muffler servicing the Bottle Rock Geothermal Power Plant.

## Permit Conditions

**Condition 1** The herein permitted well shall be operated in compliance and consistent with the steam transmission and power plant Authority to Construct (A/C) and Permit to Operate (P/O) conditions where applicable. The herein permitted well shall be operated in compliance with all Lake County Air Quality Management District (LCAQMD), State, and Federal laws and regulations.

**Condition 2** Bottle Rock Power, LLC (BRP) shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the planned venting of any well or group of wells in the LCAQMD owned or operated by BRP in an amount in excess of either 3,000 lbs of steam per hour per well or 20,000 lbs of steam per hour total. Testing to characterize emissions may be required by the Air Pollution Control Officer (APCO) for significant well bleeds or vents. In the event source testing of any geothermal well is deemed necessary by the APCO, BRP will provide safe access and sampling ports.

**Condition 3** BRP shall submit to the LCAQMD an application for, and receive, an A/C or modify permit prior to constructing, erecting, altering or replacing any equipment which may cause, potentially cause, reduce, control or eliminate the issuance of air contaminants. This does not include normal and routine maintenance nor well clean out and repairs. It does include deepening, altering or increasing the well bore size in a manner to constitute a modification of the source. BRP shall notify the LCAQMD in advance of, and receive approval for, any planned reworking/maintenance of any of the herein permitted production wells. Conditions for approval of such maintenance work will consider the level and duration of emissions, and the conditions incorporated in current BRP A/C permits and performance plans. BRP shall within thirty (30) days after the completion of re-drilling, re-working or flow testing submit to the LCAQMD the results of any routine or required chemical analysis and/or testing accomplished for the herein listed geothermal development wells that indicate emissions or potential emissions into the air.

( Conditions 4 through 12 are continued on the back of this card )

## THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

This permit does not authorize the emission of air contaminants in excess of those allowed by the California Health and Safety Code or the Regulations of the Lake County Air Quality Management District. This permit cannot be considered permission to violate existing laws, ordinances, regulations, or statutes of other government agencies. The provisions of this Permit are severable. If any provision of this Permit is held invalid, the remainder of this Permit shall not be affected thereby.

**Condition 4** BRP shall promptly notify the LCAQMD in writing should they learn of, or encounter conditions where toxic air emissions of concern from an occupational standpoint occur and which are allowed to disperse into the ambient air.

**Condition 5** If locks or unmanned gates are used to secure the project area, the LCAQMD will be given keys or combinations and allowed free access of entry for purposes of monitoring, collection of samples and inspecting. If locks or access codes are changed periodically, BRP shall promptly forward new keys or access codes.

**Condition 6** BRP will install and utilize when determined practicable, and when requested by the APCO, an in-line continuous hydrogen sulfide (H<sub>2</sub>S) monitor or other appropriate equipment to ascertain the levels of this pollutant released at the main steam transmission line prior to the turbine main steam stop valve as a result of operating the herein permitted wells. The results of such monitoring will be immediately available to LCAQMD personnel upon request.

**Condition 7** Road and pad dust for three (3) minutes or more duration will be kept below Ringlemann 2 at all times by making use of watering, oiling or surfacing of roads or by such other means deemed appropriate.

**Condition 8** The herein permitted well shall not create a nuisance nor make a measurable contribution to Ambient Air Quality Standard exceeds. BRP shall limit emissions during maintenance bleed operation to no more than twenty-four (24) pounds per day. Certain temporary exceptions may be granted for clearing the well, breakdowns or testing operations if they are short term and performed during periods of good dispersion as determined by the LCAQMD. BRP shall log steam flow rates and venting duration, and report to the LCAQMD on a monthly basis the amounts vented to atmosphere covered by this condition. Upon request the H<sub>2</sub>S levels of such venting shall be measured and reported to the LCAQMD.

**Condition 9** This permit is for a single geothermal production well. BRP agrees that this permit does not establish a precedent for issuing future permits to BRP.

**Condition 10** If it is determined that emissions limitations, as required by Rule 421.B of LCAQMD Rules and Regulations cannot be maintained, then BRP shall, with approval of the LCAQMD, install and utilize additional equipment or technology as necessary to bring emissions into compliance. This may include, but is not limited to, cycling of or the gas capping of any well in violation of rules and regulations or otherwise vented through a collection system and abated as required by that source permit. An exception may be granted by the APCO on a case by case basis for clearing gas capped wells or dealing with unanticipated breakdowns provided data is gathered to convince the APCO that coincident air dispersion is good and emissions are unlikely to effect any member of the public.

**Condition 11** BRP agrees to promptly fund reasonable studies or tests as required by the LCAQMD, to ascertain the impact of steam production activities specifically at the residence located approximately 1900 ft. east of the Francisco pad should the resident in good faith file complaints with the LCAQMD indicating a nuisance or unhealthful air quality exists as a result of development activity on the Francisco leasehold. These studies shall include, but not be limited to monitoring at the residence to determine H<sub>2</sub>S levels and particulate, or other components which are believed or known to be in geothermal steam, tracer tests or source tests of emission sources on the leasehold. Such studies shall be approved by the LCAQMD prior to the initiation. Reasonable mitigation steps shall be applied upon request of the LCAQMD to attempt to remedy any unlawful impacts of the development project upon the residence.

**Condition 12** At the request of the LCAQMD, BRP shall fund or install and maintain an air quality monitoring site (H<sub>2</sub>S, wind direction, wind speed, temperature) to assist the LCAQMD in determining compliance and the validity of emission limitations set forth in these conditions for the BRP Power Plant and Francisco Steamfield Project. It is agreed that this Condition is not intended nor does it require a monitoring station on a well by well basis. If chemical or particulate analysis performed as part of source testing suggests the need for further study including air dispersion analysis, BRP will assist, perform or assist in financing such studies if deemed reasonable and necessary by the APCO.



# AUTHORITY TO CONSTRUCT

## Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # A/C 2006-06

By: Douglas G. Gearhart  
Douglas G. Gearhart, APCO

Type of Issuance: Renewal Issuance Date: 10/31/2024 Valid through: 10/31/2025 Category: IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Susan Petty  
Owner: Bottle Rock Power, LLC  
Mailing: c/o AltaRock Energy, Inc.  
Address: P.O. Box 31205  
Seattle, WA 98103-8099

Facility: Coleman Padsite  
Location: 600m N of S, 320m E of W, Section 5, T11N,  
R8W, MDB&M, Lake County  
Coleman Pad, Bottle Rock / Francisco  
Leasehold, Cobb Valley, CA

### Name and Equipment Description: Coleman 5-5 Re-Drill

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H<sub>2</sub>O<sub>2</sub>; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

### *Permit Conditions*

#### **Condition 1: Emissions**

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H<sub>2</sub>S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H<sub>2</sub>S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H<sub>2</sub>S, BRP agrees to reduce the H<sub>2</sub>S emission limit to two (2) pounds of H<sub>2</sub>S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H<sub>2</sub>S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H<sub>2</sub>S levels are encountered during drilling, BRP will either: 1) Place into operation additional H<sub>2</sub>S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H<sub>2</sub>S means abated emissions greater than five (5) pounds of H<sub>2</sub>S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

#### **Condition 2: Administrative**

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H<sub>2</sub>S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr

( Conditions 2 through 6 are continued on the back of this card )

### **THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION**

This permit does not authorize the emission of air contaminants in excess of those allowed by the California Health and Safety Code or the Regulations of the Lake County Air Quality Management District. This permit cannot be considered permission to violate existing laws, ordinances, regulations, or statutes of other government agencies. The provisions of this Permit are severable. If any provision of this Permit is held invalid, the remainder of this Permit shall not be affected thereby.

air/steam and a converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review. 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored. 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD. 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.

F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

**Condition 3: Notification**

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.

B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report:

a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.

C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.

D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.

E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

**Condition 4: Modification/Additions**

A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

**Condition 5: Monitoring and Testing**

A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE\*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in  $\mu\text{g}/\text{kg}$  of steam); Asbestos (fibers/kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. \*Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.

B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.

C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

D. BRP shall install and utilize an in-line continuous H<sub>2</sub>S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.

F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.

G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).

H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H<sub>2</sub>S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H<sub>2</sub>S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.

I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

**Condition 6: Identification and Access**

A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.

B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.



# PERMIT TO OPERATE

## Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 2014-10

By: Douglas G. Gearhart  
Douglas G. Gearhart, APCO

Type of Issuance: Renewal Issuance Date: 10/31/2024 Valid through: 10/31/2025 Category: IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Susan Petty  
Owner: Bottle Rock Power, LLC  
Mailing: c/o AltaRock Energy, Inc.  
Address: P.O. Box 31205  
Seattle, WA 98103-8099

Facility: Coleman Padsite  
Location: 600m N of S, 320m E of W, Section 5, T11N,  
R8W, MDB&M, Lake County  
Coleman Pad, Bottle Rock / Francisco  
Leasehold, Cobb Valley, CA

### Name and Equipment Description: Coleman 6-5

One (1) geothermal production/injection well, associated valving, condensate and rock removal (catcher), and bleed muffler servicing the Bottle Rock Geothermal Power Plant. One (1) geothermal production well condensate collection piping system constructed of: 20' x 36" slotted and solid pipe, with cone reducer, one (1) 12" cleanout, and two (2) knock-out pots.

### Permit Conditions

#### Condition 1: Emissions

- A. Bottle Rock Power, LLC (BRP) shall limit Hydrogen Sulfide (H<sub>2</sub>S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H<sub>2</sub>S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verified breakdown and for hot-liner installations, Lake County Air Quality Management District (LCAQMD) Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H<sub>2</sub>S, BRP agrees to reduce the H<sub>2</sub>S emission limit to two (2) pounds or less of H<sub>2</sub>S per hour consistent with the BRP H<sub>2</sub>S Abatement Plan, at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H<sub>2</sub>S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.
- B. If excessively high H<sub>2</sub>S levels are encountered during drilling, BRP will either: a) Place into operation additional H<sub>2</sub>S abatement capacity, or b) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H<sub>2</sub>S means abated emissions greater than five (5) pounds of H<sub>2</sub>S per hour or abated emission levels in excess of 500 ppm volume.
- C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.
- D. On commencement of air drilling in significant serpentine or upon experiencing red/pink plume exiting the cyclone, the well logger shall immediately obtain bulk samples of the drilled material and log the event in the abatement logbook, and shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). "Experiencing a pink/red plume" shall mean a plume of greater than 5% opacity lasting for 30 or more seconds. For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine content. The LCAQMD shall be promptly notified by phone at 263-7000, provided a portion of the divided bulk samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten (10) working days of sampling. Bulk Samples collected upon experiencing a pink/red plume shall be promptly analyzed by XRF, or other acceptable means, to include at a minimum arsenic, chrome, nickel and cadmium. BRP shall, to the extent practical attempt to collect a sample of the particulate from the pink/red plume, and/or assist the LCAQMD in such an attempt, for analysis as described.
- E. During drilling in significant serpentine, or while experiencing a pink/red plume, visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine or drilling conditions contributing to the formation of pink/red plume.

#### Condition 2: Administrative

- A. This permit has been issued for the geothermal well to function in either injection or production mode. The well is constructed at a total depth of 10,700 feet and includes a well bore, well head, valving, piping, flanges, geothermal fluid transmission line header connections, side leg kick-out, two part slotted liner, and associated corrosion mitigation injection equipment. This permit allows drilling for well maintenance; significant drilling and work overs may require an Authority to Construct permit for the modification. This permit does not establish a precedent for the issuance of additional permits.
- B. The submitted BRP H<sub>2</sub>S abatement plan approved by the APCO or subsequent approved revision, shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily.
- C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15 ppmw sulfur.
- D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO

( Conditions 2 through 6 are continued on the back of this card )

### THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

This permit does not authorize the emission of air contaminants in excess of those allowed by the California Health and Safety Code or the Regulations of the Lake County Air Quality Management District. This permit cannot be considered permission to violate existing laws, ordinances, regulations, or statutes of other government agencies. The provisions of this Permit are severable. If any provision of this Permit is held invalid, the remainder of this Permit shall not be affected thereby.

determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the same particulate scrubbing system (or an equivalent system approved by the APCO) as that utilized in recent drilling projects as described in the permitting reviews and includes the following configuration: a) A multi-port 60 GPM or greater adjustable low pressure water injection system in the 13" inside diameter portion of the blooie line (non-constricting venturi) combined with at least 20,000 lbs/hr steam. The constricting venturi scrubber shall not be required when drilling in greater than 20,000 lbs/hr of steam, or when the pressure drop exceeds four (4) PSI across the venturi. Both constricting and non-constricting venturists shall be as submitted and reviewed by the LCAQMD; b) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; a shortened outlet barrel to approximately 1.25 times the inlet height; and acceptable measurement devices to ensure flows and pressures are properly monitored; c) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound logbook and the emission and/or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD within 15 days of occurrence; and d) The APCO may modify these requirements based upon presentation of new information and selection of alternatives proven to be more effective.

F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

### Condition 3: Notification

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.

B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.

C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD owned or operated by BRP. This notice shall also apply to scheduled installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Muffler utilization; e) Abatement utilization; and f) The likelihood or need for future occurrences.

D. Upon APCO request, BRP shall notify the LCAQMD at least twenty-four (24) hours in advance of planned switch from production to injection or injection to production mode of the well.

E. In the event that any emissions or the steam plume obscure visibility or create a hazard, BRP shall ensure that posting, warning or other necessary steps are made to ensure safe passage for the public.

F. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as a mitigation.

G. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine or crystalline silica material actually encountered during drilling.

### Condition 4: Modification

A. BRP shall apply for and receive an Authority to Construct permit prior to the addition of different or new equipment not identified in this permit or covered in the permitting review.

### Condition 5: Monitoring and Testing

A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, H2S, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, H2S, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and daughters. c) STEAM PARTICULATE\*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in  $\mu\text{g/Kg}$  of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly put into a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is placed on vent for 30 or more days. \*Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.

B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten (10) days after written notice, to open the well for a 4 to 8 hour duration.

C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.

F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.

G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).

H. If the well is placed on long-term standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.

I. Upon request of the APCO, BRP shall fund, install and maintain an air quality monitoring site (H2S, wind direction, wind speed and temperature) to assist the District in determining compliance with the H2S Ambient Air Quality Standard (AAQS). Continued participation in the Geysers Air Monitoring Program or a similar monitoring program will continue to be required during and beyond the scope of this project.

J. If significant dust complaints are received BRP shall fund, install, and maintain a continuous Federal Equivalent Method Particulate Matter (PM) or LCAQMD approved alternate sampler within fifteen (15) days of request by the APCO.

K. Upon request of the APCO, BRP shall fund, install, and maintain an LCAQMD approved H2S air quality monitoring station, and/or provide access, siting, and power for an LCAQMD monitoring station, during the new drilling, located between the rig and the property line nearest the closest downwind residence in order to monitor H2S emissions associated with construction.

### Condition 6: Identification and Access

A. This permit shall be posted at the project site during the time the drill is on site, and be available for BRP and LCAQMD staff upon request.

B. BRP shall provide the LCAQMD, ARB and, Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.



# AUTHORITY TO CONSTRUCT

**Lake County Air Quality Management District**  
2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # A/C 2006-30

By: Douglas G. Gearhart  
Douglas G. Gearhart, APCO

Type of Issuance: Renewal Issuance Date: 10/31/2024 Valid through: 10/31/2025 Category: IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Susan Petty  
Owner: Bottle Rock Power, LLC  
Mailing: c/o AltaRock Energy, Inc.  
Address: P.O. Box 31205  
Seattle, WA 98103-8099

Facility: Coleman Padsite  
Location: 600m N of S, 320m E of W, Section 5, T11N,  
R8W, MDB&M, Lake County Coleman Pad,  
Bottle Rock / Francisco Leasehold, Cobb Valley,  
CA

## Name and Equipment Description: Coleman 7-5

Geothermal drilling rig and accessories (NCPA Rig #1, equivalent or superior), four (4) electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three (3) air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one (1) down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H<sub>2</sub>O<sub>2</sub>; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

## *Permit Conditions*

### **Condition 1: Emissions**

- A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H<sub>2</sub>S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H<sub>2</sub>S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H<sub>2</sub>S, BRP agrees to reduce the H<sub>2</sub>S emission limit to two (2) pounds of H<sub>2</sub>S per hour using the approved abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H<sub>2</sub>S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.
- B. If excessively high H<sub>2</sub>S levels are encountered during drilling, BRP will either: 1) Place into operation additional H<sub>2</sub>S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H<sub>2</sub>S means abated emissions greater than five (5) pounds of H<sub>2</sub>S per hour or abated emission levels in excess of 500 ppmv.
- C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour:
- Ringelmann 0.5 (10% opacity) for detached plume at the cyclone;
  - Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and
  - Ringelmann 1 (20% opacity) for road and pad dust emissions.
- D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.
- E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

### **Condition 2: Administrative**

- A. This permit has been issued for the construction of a geothermal production well to include a fork leg from the main bore as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.
- B. The submitted BRP (Tecton) H<sub>2</sub>S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.
- C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.
- D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

( Conditions 2 through 6 are continued on the back of this card )

## **THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION**

This permit does not authorize the emission of air contaminants in excess of those allowed by the California Health and Safety Code or the Regulations of the Lake County Air Quality Management District. This permit cannot be considered permission to violate existing laws, ordinances, regulations, or statutes of other government agencies. The provisions of this Permit are severable. If any provision of this Permit is held invalid, the remainder of this Permit shall not be affected thereby.

E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and recently utilized and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam and a converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review; 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored; 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD; and 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.

F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

### Condition 3: Notification

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.

B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.

C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.

D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.

E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

### Condition 4: Modification/Additions

A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

### Condition 5: Monitoring and Testing

A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE\*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in  $\mu\text{g/Kg}$  of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon written request of BRP and concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days. \*Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.

B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.

C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

D. BRP shall install and utilize an in-line continuous H<sub>2</sub>S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.

F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.

G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).

H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H<sub>2</sub>S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H<sub>2</sub>S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.

I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

### Condition 6: Identification and Access

A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.

B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in this A/C Review. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.



# AUTHORITY TO CONSTRUCT

## Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # A/C 2006-31

By: Douglas G. Gearhart  
Douglas G. Gearhart, APCO

Type of Issuance: Renewal Issuance Date: 10/31/2024 Valid through: 10/31/2025 Category: IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Susan Petty  
Owner: Bottle Rock Power, LLC  
Mailing: c/o AltaRock Energy, Inc.  
Address: P.O. Box 31205  
Seattle, WA 98103-8099

Facility: Coleman Padsite  
Location: 600m N of S, 320m E of W, Section 5, T11N,  
R8W, MDB&M, Lake County Coleman Pad,  
Bottle Rock / Francisco Leasehold, Cobb Valley,  
CA

### Name and Equipment Description: Coleman 8-5

Geothermal drilling rig and accessories (NCPA Rig #1, equivalent or superior), four (4) electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three (3) air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one (1) down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H<sub>2</sub>O<sub>2</sub>; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

### Permit Conditions

#### **Condition 1: Emissions**

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H<sub>2</sub>S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H<sub>2</sub>S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H<sub>2</sub>S, BRP agrees to reduce the H<sub>2</sub>S emission limit to two (2) pounds of H<sub>2</sub>S per hour using the approved abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H<sub>2</sub>S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H<sub>2</sub>S levels are encountered during drilling, BRP will either: 1) Place into operation additional H<sub>2</sub>S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H<sub>2</sub>S means abated emissions greater than five (5) pounds of H<sub>2</sub>S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour:

- Ringelmann 0.5 (10% opacity) for detached plume at the cyclone;
- Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and
- Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

#### **Condition 2: Administrative**

A. This permit has been issued for the construction of a geothermal production well to include a fork leg from the main bore as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H<sub>2</sub>S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

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D. BRP shall install and utilize an in-line continuous H<sub>2</sub>S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

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B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in this A/C Review. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.