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| <b>Docket Number:</b>   | 82-AFC-01C  |
| <b>Project Title:</b>   | Compliance - Application for Certification for PG&E Geysers Unit 20 |
| <b>TN #:</b>            | 225931  |
| <b>Document Title:</b>  | Revised Air Quality and Worker Safety Conditions of Certification   |
| <b>Description:</b>     | N/A   |
| <b>Filer:</b>           | Raquel Rodriguez  |
| <b>Organization:</b>    | California Energy Commission  |
| <b>Submitter Role:</b>  | Commission Staff  |
| <b>Submission Date:</b> | 11/20/2018 1:12:16 PM   |
| <b>Docketed Date:</b>   | 11/20/2018  |

# Memorandum

To: Commission Docket

Date November 20, 2018

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From : **Eric W. Veerkamp, Compliance Project Manager**  
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Subject: Quicksilver Geothermal (formerly Geysers Unit 16) (79-AFC-05C), Socrates Geothermal (formerly Geysers Unit 18) (79-AFC-03C), and Grant Geothermal (formerly Geysers Unit 20) (82-AFC-01) Revised Air Quality and Worker Safety Conditions of Certification

On August 23, 2018, staff filed its Staff Assessment of the Geysers Power Company, LLC petition to amend requesting identical modifications at each of the facilities to replace temporary portable emergency diesel engines with stationary permanent emergency diesel engines for the cooling tower wet down systems to aid in fire prevention at the Quicksilver, Socrates, and Grant geothermal power plants.

On September 17, 2018 the project owner filed comments on the Staff Assessment including comments and suggested edits to **Worker Safety-1**. After considering those comments, staff proposed additional revisions to **Worker Safety-1**, docketed on October 15, 2018, to replace the version contained in the Staff Assessment filed on August 23, 2018.

On October 18, 2018, the applicant filed comments on the staff assessment, including comments and suggested edits to staff's revisions to air district permit conditions and worker safety conditions. Staff again filed a response to comments, docketed on November 1, 2018.

After considering those comments, staff and the applicant conducted a noticed workshop on November 8, 2018, later continued for further discussion and conclusion on November 15, 2018. Staff's attached proposed edits to the conditions do not change any of the analysis found in the Staff Assessment.

This is a new condition of certification proposed for this petition to amend. The Changes from the October 15, 2018 Staff Assessment are shown below. (Note: Deleted text is in ~~double strikethrough~~, new text is **bold and underlined**.)

**WORKER SAFETY-1 The project owner shall physically disconnect the piping connection between the cooling tower wet-down system and the plant's fire protection system unless the project owner installs a code compliant integrated wet down/fire protection system after obtaining the approval of the CPM. The installation of an is approved by the CPM. Completion of the commissioning of the integrated system terminates the requirement to disconnect the system.**

**Verification: The project owner shall complete the physical disconnection of the cooling tower wet-down system from the plant's fire protection system no later than January 1, 2019 or a later date if agreed upon by the CPM. June 1, 2019, or a later date agreed upon by the CPM, unless the CPM has approved a commissioned, integrated system. Within 10 days after the disconnection, the project owner shall submit a letter stating that the physical disconnection has occurred and provide a photograph showing the disconnection. The CPM may approve a later date for disconnection if the project owner has submitted a request for alternate means of protection pursuant to Title 24 California Fire Code section 1.11.2.4 to the CPM for review and approval. The CPM shall be notified at least 30 days prior to the current disconnection date if the project owner wishes to seek an extension to the current disconnection date.** The project owner shall submit a letter stating that the physical disconnection has occurred and provide the final DCBO approved design drawings along with photographs showing the implementation no later than 30 days after the disconnection

## Revised Air Quality Conditions of Certification

**Note:** The original staff analysis is included in TN 224577, published August 23, 2018, with proposed edits in **bolded ~~strikeout~~** and **single underline**. The petitioner docketed comments on the staff analysis. Staff held two public workshops to discuss petitioner-proposed changes to the August 23 language. The petitioner and staff verbally agreed upon language revisions at the noticed November 8<sup>th</sup> and November 15<sup>th</sup>, 2018 workshops. Language changes from the original August 23, 2018 staff analysis are shown in bolded ~~double-strikeout~~ and **double underline**.

Language already included in the Northern Sonoma Air Pollution Control District permits related to replacement with identical or equivalent equipment is being added to the conditions. Staff is also proposing the addition of a staff condition to ensure a current equipment list is maintained and made available to the Energy Commission upon request. The following language will be included before the proposed listed equipment table. In addition, the following staff condition would be included in the Staff Conditions section. The revised condition language is consistent with the analysis contained in the Staff Assessment.

### **Quicksilver Geothermal (79-AFC-05)**

**AQ-5C** ~~GST~~ **The project owner** shall annually conduct a comprehensive emissions test. The incoming steam, condensate, circulating water and cooling tower stack shall be tested for H<sub>2</sub>S, ammonia, arsenic, boron, hexavalent chrome, mercury, radon 222, and particulates as appropriate. The APCO **or CPM** may request analysis for additional components and testing at other process points upon reasonable request and in a manner necessary to comply with AB 2588 or other applicable law(s). The annual test plan shall be submitted for LCAQMD review and approval 45 days prior to the planned test. The results of the test shall be provided to the LCAQMD within 60 days of the completion of the test, or as soon as practicable.

**Verification: The project owner shall provide the CPM a copy of the approved annual test plan. The project owner shall summarize compliance in the Annual Compliance Report. The CPM shall provide the project owner with any requests for analysis of additional components or other process points at least 60 days prior to the next scheduled test or other timeframe as agreed upon between the project owner and CPM. The project owner shall make the site and records available for inspection by representatives of the District, ARB, and Energy Commission upon request.**

### **Socrates Geothermal (79-AFC-03C) and Grant Geothermal (82-AFC-01C)**

**AQ-C3/C4** **The project owner, as requested by the Air Pollution Control Officer or CPM, shall conduct a requestor-approved performance test for particulate matter (PM), H<sub>2</sub>S, other species (i.e. benzene, mercury, arsenic, TRS, mercaptans, radon, other nitrogen compounds (amines) and compounds listed under NESHAPS and/or AB2588 from the power plant evaporative cooling tower and/or the Stretford evaporative cooling tower. Upon written request, the project**

owner shall submit to the Requestor at least 45 days prior to testing a detailed performance test plan. The requestor shall approve, disapprove or modify the plan within 45 days of receipt of the plan. The project owner shall incorporate the requestor's comments or modifications to the plan which are required to assure compliance with the requestor's regulations. The Air Pollution Control Officer shall be notified 15 days prior to the test date in order to arrange for an observer to be present for the test. The test results shall be provided to the District and CPM within 45 days of the test date unless a different submittal schedule is approved in advance. [ref. PTO 79-25a Cond. 9 and 10]

Verification: The project owner shall conduct performance tests as requested by the Air Pollution Control Officer or CPM. The project owner shall submit results to the CPM within 45 days if the test was requested by the CPM or in the quarterly reports according to Condition AQ-E1 if the test was requested by the Air Pollution Control Officer.

AQ-C8/C9 All sampling protocols, chemical feed charts, targets and operational guidelines for using said charts and targets, necessary to abate H<sub>2</sub>S emissions from the power plant to the emission limits specified in Conditions AQ-A1 and AQ-A2 must be developed using good engineering judgment and supporting data. The APCO or CPM may review such sampling protocols, chemical feed charts, targets and guidelines upon request. If the APCO or CPM determines that any of the protocols, feed charts, targets, or guidelines are not sufficient to maintain compliance with Conditions AQ-A1 and AQ-A2, the APCO or CPM shall require the project owner to develop revised protocols, feed charts, targets and guidelines. [ref. Rule 240(d)]

Verification: The project owner shall submit any revised protocol, feed charts, targets and guidelines or summary to the CPM in the annual reports required by Condition AQ-E2. The project owner shall make the site and records available for inspection by representatives of the District, ARB, U.S. EPA, and Energy Commission upon request. The CPM shall consult with the APCO and the project owner when developing revised protocols, feed charts, targets and guidelines.

#### Grant Geothermal (82-AFC-01C)

AQ-B11 The project owner shall, in any 12-month period, limit unscheduled outages for the project to no more than a total of 12. The following shall not be used in computing the total outages.

- a. Scheduled outages (defined as outages with 24-hour advance notice between the steam supplier and project owner, except in the case of project outages resulting from an abundance of hydropower in which case a scheduled outage shall be defined as one-hour notice).
- b. Steam supplier induced outages (such as pressure surge, strainer plugging, etc.).

- c. Outages of less than 2 hours in duration.
- d. Outages which do not cause steam stacking.

A violation of the above performance standards is considered a violation of this condition.

The project owner shall have on file with the District an approved operating protocol describing the methods that will be used to meet the 12 outages in 12 consecutive months performance standard. The protocol must include a description of the operational procedures between the steam supplier and project owner, project owner's operational procedures, and equipment to meet the above standard. The terms and requirements of the protocol may be modified by the Air Pollution Control Officer and CPM for good cause upon written request from the project owner.

The project owner shall allow the District and CPM to inspect all operating logs to verify the total outage hours. These requirements are in addition to the applicable requirements of rule 540.

In the event the project owner is not able to meet the standards specified above, the following shall be required:

The project owner shall prepare and submit a revised "plan" to the Air pollution Control Officer and CPM, within 30 days of the end of the month in which the outage limit was exceeded, to achieve the outage standards set forth in this permit condition. At a minimum, the measures to be considered in the "plan" shall include: improved coordination of the power plant and steam field operations, improved alarming and control systems, increased duration of manned operation of the power plant, improved preventative maintenance and design modifications, retrofit of a 100% of steam flow turbine bypass, and retrofit of a 50% of steam flow turbine bypass. In evaluating measures to be taken to prevent future exceedances of the outage standard, outages of less than 2 hours shall be counted. This "plan" shall also be submitted to EPA for approval if the outage standard is exceeded.

Within 30 days of receipt of the "plan" the Air Pollution Control Officer shall determine whether the "plan" is satisfactory and, if so, shall approve the "plan". Upon approval, the revised "plan" shall supersede the old plan and become a part of the terms and conditions of this permit.

[ref. PSD SFB 81-03 Cond. IX.C., PT0-82-45A Cond.18]

Verification: The project owner shall submit revised plans to the CPM for approval review. The project owner shall submit any plan approval, disapproval or plan modification to the CPM in the following quarterly report. The project owner shall make the site and records available for inspection by representatives of the District, ARB, U.S. EPA, and Energy Commission upon request.

Socrates Geothermal (79-AFC-03C)

**AQ-E1** **A quarterly report shall be submitted to the District which contains the following information:**

- a. **CCM availability for the given quarter.**
- b. **Any periods of significant abatement equipment malfunction, reasons for malfunctions, and corrective action taken.**
- c. **Time and date of any monitor indicating an hourly average exceedance of 10 ppmv of H<sub>2</sub>S.**
- d. **Source test results.**

**Additional requirement for reports submitted to the Energy Commission:**

- ~~e. **Hours of operation for the emergency engine. The hours of operation shall be reported according to total use, emergency use, and maintenance and testing.**~~

**The quarterly report shall be submitted to the District and CPM within 30 days of the end of each quarter. The reports are due by May 1, August 1, November 1 and February 1 for each corresponding quarter.**

**[ref. Rule 240(d)]**

**Verification: The project owner shall submit the quarterly reports to the CPM. The project owner shall make the site and records available for inspection by representatives of the District, ARB, U.S. EPA, and Energy Commission upon request.**

**AQ-E2** **An annual report shall be submitted to the District and CPM which contains the following information:**

- a. **Average mainsteam H<sub>2</sub>S and ammonia concentrations.**
- b. **Average total dissolved and suspended solids and average flowrate of the cooling tower water.**
- c. **Annual ammonia emissions.**
- d. **Gross megawatt hours generated.**
- e. **Steaming rate, gross average (gross steam flow; lb/ gross MW).**
- f. **Update to any changes in operating protocols used to determine plant chemical feed charts and targets; calibration and maintenance programs.**
- g. **Total organic gasses emitted as methane.**
- h. **Hours of plant operation.**
- i. **Annual carbon dioxide equivalent (CO<sub>2</sub>e) emissions**
- j. **Annual H<sub>2</sub>S, PM-10 and PM-2.5 emissions.**

**Additional requirement for reports submitted to the Energy Commission:**

- k. **Hours of operation for the emergency engine. The hours of operation shall be**

reported according to total use, emergency use, and maintenance and testing.

The annual report shall be submitted to the District within 45 days of the end of each calendar year.

[ref. Rule 240(d)]

Verification: The project owner shall submit the annual reports to the CPM within 45 days of the end of each calendar year or another timeframe approved by the CPM. The project owner shall make the site and records available for inspection by representatives of the District, ARB, U.S. EPA, and Energy Commission upon request.

#### Grant Geothermal (82-AFC-01C)

AQ-E1 A quarterly report shall be submitted to the District which contains the following information:

- a. CCM availability for the given quarter.
- b. Any periods of significant abatement equipment malfunction, reasons for malfunctions, and corrective action taken.
- c. Time and date of any monitor indicating an hourly average exceedance of 10 ppmv of H<sub>2</sub>S.
- d. Source test results.
- e. Steam stacking events.

~~Additional requirement for reports submitted to the Energy Commission:~~

- ~~f. Hours of operation for the emergency engine. The hours of operation shall be reported according to total use, emergency use, and maintenance and testing.~~

The quarterly report shall be submitted to the District and CPM within 30 days of the end of each quarter. The reports are due by May 1, August 1, November 1 and February 1 for each corresponding quarter.

[ref. Rule 240(d)]

Verification: The project owner shall submit the quarterly reports to the CPM. The project owner shall make the site and records available for inspection by representatives of the District, ARB, U.S. EPA, and Energy Commission upon request.

AQ-E2 An annual report shall be submitted to the District and CPM which contains the following information:

- a. Average mainsteam H<sub>2</sub>S and ammonia concentrations.
- b. Average total dissolved and suspended solids and average flowrate of the cooling tower water.
- c. Annual ammonia emissions.



- d. Gross megawatt hours generated.
- e. Steaming rate, gross average (gross steam flow; lb/ gross MW).
- f. Update to any changes in operating protocols used to determine plant chemical feed charts and targets; calibration and maintenance programs.
- g. Total organic gasses emitted as methane.
- h. Hours of plant operation.
- i. Annual carbon dioxide equivalent (CO<sub>2e</sub>) emissions
- j. Annual H<sub>2</sub>S, PM10 and PM2.5 emissions.

Additional requirement for reports submitted to the Energy Commission:

- k. Hours of operation for the emergency engine. The hours of operation shall be reported according to total use, emergency use, and maintenance and testing.

The annual report shall be submitted to the District within 45 days of the end of each calendar year.

[ref. Rule 240(d)]

Verification: The project owner shall submit the annual reports to the CPM within 45 days of the end of each calendar year or another timeframe approved by the CPM. The project owner shall make the site and records available for inspection by representatives of the District, ARB, U.S. EPA, and Energy Commission upon request.

Socrates Geothermal (79-AFC-03C) and Grant Geothermal (82-AFC-01C)

#### **EQUIPMENT DESCRIPTION**

The equipment and capacities listed are based on information provided by the permit holder to the Northern Sonoma Air Pollution Control District (District or NSCAPCD). Routine maintenance, repair, or replacement with identical or equivalent equipment that does not result in an increase, or potential increase, in emissions of any air pollutant subject to District control does not require a permit modification with the District. Replacement equipment that is within 5% of the listed capacity shall be considered equivalent for the purposes of the District permit(s).

Pumps listed with a capacity range may be replaced with pumps within the listed range without notification to the District. Any replacement of pumps outside the listed range shall receive District approval prior to replacement.

#### **STAFF CONDITIONS**

AQ-SC4 The project owner shall maintain a current equipment list for the facility.

Verification: The project owner shall provide the CPM with the equipment list upon request.