

CALIFORNIA ENERGY COMMISSION

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DATE: November 20, 2012

TO: Interested Parties

FROM: Camille Remy Obad, Compliance Project Manager

California Energy Commission

DOCKETED
08-AFC-1C

TN # 68601

NOV. 20 2012

SUBJECT: AVENAL ENERGY PROJECT (08-AFC-1C)
Staff Analysis of Proposed Modifications to Allow for Construction and Operation As Either a Major or a Minor Stationary Source of Criteria Air Pollutant Emissions and to Make Minor Modifications to Air Quality Conditions of Certification

On March 5, 2012, the project owners, Avenal Power Center, LLC (APC), filed a Petition to Amend (Petition) with the California Energy Commission (Energy Commission) to modify the Energy Commission Final Decision (Decision) for the project. Staff prepared an analysis of the proposed changes, and a copy is enclosed for your information and review¹.

The proposed Avenal Energy Project (Project) would be a 600-megawatt (MW) combined cycle power plant located in the City of Avenal, in Kings County. The Project was certified by the Energy Commission on December 16, 2009.

The proposed amendment would allow the following modifications to the Decision:

- 1) add one new Air Quality condition of certification (COC), **AQ-SC12**, to allow the option to construct and operate the power plant as either a major stationary source of criteria air pollutant emissions² (as certified) or as a minor stationary source of criteria air pollutant emissions³;
- 2) modify two Air Quality COCs (**AQ-6**, **AQ-71**), relating to reissued Emission Reduction Credit (ERC) certificate numbers and equipment descriptions;

¹ The initial Petition to Amend (PTA) proposed a construction deadline extension. Since the current deadline to commence construction does not expire until December 16, 2014, staff recommended, and APC agreed, to defer the extension request until additional information to support the request is gathered and evaluated. If needed, this proposed change will be the subject of a separate Staff Analysis and may be considered at a future Business Meeting.

² A stationary emission source that exceeds applicable review thresholds and requires a Prevention of Significant Deterioration (PSD) permit from the U.S. Environmental Protection Agency (EPA), or from the local air pollution control district once applicable local rules are incorporated into the State Implementation Plan.

³ A stationary emission source that does not exceed applicable review thresholds and does not require a PSD permit from the U.S. EPA or the local air pollution control district. Note that Avenal would exceed greenhouse gas PSD major source thresholds, but has been exempted from this requirement by the U.S. EPA. This decision has been appealed to the Ninth Circuit Court of Appeals in San Francisco, CA.

- 3) modify two Air Quality COCs (**AQ-110 and AQ-111**) to comply with new Compression Ignition New Source Performance Standards (40 CFR Part 60, Subpart IIII); and
- 4) update COC **AQ-122** equipment descriptions so that the equipment analyzed by staff conforms with the analysis in the Decision.

Energy Commission staff reviewed the petition and assessed the impacts of the proposed modifications on environmental quality, safety and public health. Energy Commission staff supports the proposed modifications along with staff recommended changes to **AQ-111**. It is staff's opinion that, with the implementation of COC **AQ-SC12** and the revisions to the existing COCs described in the attached Air Quality Staff Analysis, the project amendment will remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) and will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

The petition and staff's analysis have been posted on the Energy Commission's webpage at <http://www.energy.ca.gov/sitingcases/avenal/>. The Energy Commission's Order (if approved) will also be posted on the webpage. Energy Commission staff intends to recommend approval of the petition at the Energy Commission's January 9, 2013, Business Meeting.

Agencies and members of the public who wish to provide written comments on the Staff Analysis are asked to submit comments to the Energy Commission Dockets Unit. Written comments must be received no later than 5:00 pm Friday, December 28th, 2012. Please include the docket number 08-AFC-1C in the subject line of your comments. Those submitting comments electronically should provide them in either Microsoft Word format or as a Portable Document Format (PDF) to docket@energy.ca.gov. Please include your name or organization's name in the file name. Those preparing non-electronic written comments should mail or hand deliver them to:

California Energy Commission
Dockets Unit, MS-4
Docket No. 08-AFC-1C
1516 Ninth Street
Sacramento, CA 95814-5512

All written comments and materials filed with the Dockets Unit will become part of the public record of the proceeding. Additionally, comments may be posted on the website.

If you have questions about the amendment request or staff's analysis, please contact Camille Remy Obad, Compliance Project Manager at (916) 654-3940 or email at cremyoba@energy.ca.gov.

If you would like information on participating in the Energy Commission's review of the project, please contact the Energy Commission's Public Adviser, Jennifer Jennings, at

(916) 654-4489 or toll free in California, at (800) 822-6228. The Public Adviser's Office can also be contacted via email at publicadviser@energy.ca.gov.

News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail at mediaoffice@energy.state.ca.us.

Mail List #7280

Enclosure

STAFF ANALYSIS

AVENAL ENERGY PROJECT

08-AFC-1C

PETITION TO AMEND

AVENAL ENERGY PROJECT (08-AFC-1C)

Petition To Amend Commission Final Decision

Executive Summary

Prepared by: Camille Remy Obad

INTRODUCTION

On February 21, 2008, Avenal Power Center, LLC (APC) filed an Application for Certification (AFC) for the Avenal Energy Project (Project) with the California Energy Commission (Energy Commission) seeking approval to construct and operate a 600-megawatt (MW) power plant in the City of Avenal in Kings County. APC also submitted a Prevention of Significant Deterioration (PSD) permit application to U.S. Environmental Protection Agency (U.S. EPA) seeking approval for the Project. The Energy Commission approved the project in a Final Decision (Decision) dated December 16, 2009, and the U.S. EPA issued a final PSD permit on May 27, 2011. Several parties petitioned the U.S. EPA Environmental Appeals Board (EAB) for review of the PSD permit. The EAB upheld the permit, but these parties have subsequently appealed EPA's issuance of the PSD Permit to the Ninth Circuit Court of Appeals.

On March 5, 2012, due to the uncertainties in the outcome or duration of the appeals process, APC filed a Petition to Amend (Petition) the Energy Commission's Final Decision (Avenal Power 2012). The amendments included a newly proposed Air Quality Condition of Certification (COC), updating information and equipment descriptions for several existing Air Quality COC's, and a request to extend the construction deadline for an additional five years. Since the deadline to commence construction does not expire until December 16, 2014, staff determined the extension request was premature. If necessary, staff will assess the need for additional information closer to the time of license expiration, and the proposed change will be the subject of a separate Staff Analysis and may be considered at a separate Business Meeting.

The purpose of the Energy Commission's review process is to assess any impacts the proposed modifications would have on environmental quality, safety and public health. The process includes an evaluation of the consistency of the proposed changes with the Decision, and if the project, as modified, will remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) (Title 20, Calif. Code of Regulations, section 1769).

PROJECT LOCATION AND DESCRIPTION

The project is licensed as a 600-megawatt (MW) combined cycle generating plant consisting of two natural gas-fired General Electric 7FA Gas Turbines with Heat Recovery Steam Generators (HRSG) and one General Electric Steam Turbine.

The proposed facility would be located on approximately 34 acres of a 148-acre site within the City of Avenal in Kings County (just south of the Fresno County line), approximately two miles east of Interstate 5.

DESCRIPTION AND NECESSITY OF THE PROPOSED MODIFICATIONS

The proposed modifications include the following:

- Adding one new Air Quality COC (**AQ-SC12**) to allow the option to construct and operate the power plant as either a major stationary source of criteria air pollutant emissions (as certified) or as a minor stationary source of criteria air pollutant emissions;
- Changing two existing Air Quality COCs (**AQ-6**, **AQ-71**) to identify reissued emission reduction credit (ERC) certificate numbers;
- Changing two existing Air Quality COCs (**AQ-110**, **AQ-111**) to modify emission limits necessary to meet the current Airborne Toxic Control Measures (ATCM) and Federal New Source Performance Standards (NSPS) for stationary compression ignition engines, and
- Updating **AQ-122** equipment descriptions to conform with staff's equipment analysis in the Decision.

The primary purpose and need for this amendment is to allow the project the option to be constructed and operated as a minor source of air emissions in the event a PSD permit cannot be successfully obtained.

STAFF'S ANALYSIS OF THE PROPOSED PROJECT CHANGES

The technical areas contained in this Staff Analysis indicate staff recommended changes to the Decision's COCs. Staff believes that by requiring the proposed changes to the existing COCs and the addition of a new COC, the potential impacts of the proposed changes would be reduced to less than significant levels. The Petition's proposed change in operation would decrease nitrogen dioxide (NO_x) and carbon monoxide (CO) emissions, thus qualifying as a minor PSD stationary source for criteria pollutants, with fewer emissions than previously analyzed and approved in the Energy Commission's December 2009 Decision. A summary of staff's conclusions reached in each technical area are presented in **EXECUTIVE SUMMARY Table 1**. The details of the proposed condition changes can be found under the appropriate Air Quality Staff Analysis.

EXECUTIVE SUMMARY Table 1
Summary of Technical Area Response to Petition

| TECHNICAL AREAS REVIEWED | STAFF RESPONSE | | |
|--|-----------------------------|--------------------------------------|------------------------|
| | Technical Area Not Affected | No Significant Environmental Impact* | Process As Amendment** |
| Air Quality | | | X |
| Biological Resources | X | | |
| Cultural Resources | | X | |
| Facility Design | | X | |
| Geological and Paleontological Resources | X | | |
| Hazardous Materials Management | X | | |
| Land Use | | X | |
| Noise and Vibration | | X | |
| Socioeconomics | | X | |
| Soil and Water Resources | X | | |
| Traffic and Transportation | X | | |
| Transmission Line Safety & Nuisance | X | | |
| Transmission System Engineering | X | | |
| Visual Resources | X | | |
| Waste Management | X | | |
| Worker Safety and Fire Protection | X | | |

*There is no possibility that the modifications may have a significant effect on the environment and the modification will not result in a change or deletion of a condition adopted by the Energy Commission in the final decision or make changes that would cause the project not to comply with any applicable laws, ordinances, regulations, or standards (LORS) (20 Cal. Code Regs., § 1769 (a)(2)).

** New or revised conditions of certification recommended by staff

Energy Commission technical staff reviewed the petition for potential environmental effects and consistency with applicable LORS. Staff has determined that no technical area, except Air Quality, is affected by the proposed changes. Therefore, with the exception of Air Quality, no revisions or new COCs are needed, to ensure the project remains in compliance with all applicable LORS and existing COCs in the Decision.

Staff has determined that the technical area of Air Quality would be affected by the proposed project changes and presents new and revised Air Quality COCs in order to assure compliance with LORS and/or to reduce potential environmental impacts to a less than significant level.

AVENAL ENERGY PROJECT (08-AFC-1C)
Petition for Amendment to Allow Construction and Operation of the
Avenal Energy Project as a Minor Source and Make Minor Modifications
to Air Quality Conditions of Certification
Joseph Hughes
November 7, 2012

INTRODUCTION

Avenal Power Company (APC) is petitioning to amend (Avenal Power 2012) the Energy Commission's Final Decision to modify various air quality conditions of certification, and to incorporate a proposed Condition of Certification (COC), **AQ-SC12**. Avenal Power Center, LLC (APC) filed an Application for Certification (AFC) for the Avenal Energy Project with the Energy Commission and submitted a Prevention of Significant Deterioration (PSD) application to U.S. Environmental Protection Agency (U.S. EPA) February 21, 2008. The Energy Commission approved the Avenal Energy Project in a Final Decision dated December 16, 2009, and the U.S. EPA issued a final PSD permit on May 27, 2011. Several parties petitioned the U.S. EPA Environmental Appeals Board (EAB) for review of the PSD permit. The EAB upheld the permit, but these parties have subsequently appealed EPA's issuance of the PSD Permit to the Ninth Circuit Court of Appeals.

Due to the uncertainties in the outcome or duration of the appeals process, the project is not under construction. APC has filed this amendment to allow it to build and operate the Avenal project either as is currently permitted as a major⁴ stationary PSD source (if the Ninth Circuit Court of Appeals decides against the appeals) or as a modified minor⁵ stationary PSD source (if the Ninth Circuit Court of Appeals decides in favor of the appeals and the U.S. EPA acknowledges the Supplemental Statement of Basis which exempts the Avenal Energy Project from the greenhouse gas [GHG] PSD requirement).

The minor PSD source revision is not associated with hardware design changes. This is accomplished by changing the proposed annual operating profile to reduce project annual emissions to "minor" PSD levels. Along with the incorporation of **AQ-SC12**, APC is requesting to make changes to COCs **AQ-6**, **AQ-71**, **AQ-110**, and **AQ-122** and to two equipment descriptions in the Energy Commission's Final Decision. Staff is also recommending modifications to **AQ-111** in light of the change to equipment descriptions.

The changes to **AQ-6** and **AQ-71** identify reissued air district emission reduction credit (ERC) certification numbers; the changes to **AQ-110** and **AQ-111** modify emission limits

⁴ A Major Source, subject to PSD, is one that emits more than 100 tons per year of an attainment pollutant.

⁵ A Minor Source, not subject to PSD, is one that emits 100 tons or less per year of an attainment pollutant.

necessary to meet the current State Airborne Toxic Control Measures (ATCM) and Federal New Source Performance Standards (NSPS) for stationary compression ignition engines; and the changes to **AQ-122** conforms the equipment description to the equipment analyzed by staff in the Final Commission Decision.

The proposed Avenal Energy Project would be a 600 MW combined cycle generating plant consisting of two natural gas-fired General Electric 7FA Gas Turbines (CTGs) with Heat Recovery Steam Generators (HRSG) and one General Electric Steam Turbine. Oxidation catalysts and a Selective Catalytic Reduction (SCR) system would also be located within each HRSG to reduce oxides of nitrogen (NO_x), carbon monoxide (CO) and volatile organic compounds (VOC) in the exhaust gases exiting the stack. The facility would also have an auxiliary boiler, fire pump engine and emergency standby generator. The project would be built on approximately 34 acres of a 148-acre site within the city of Avenal in Kings county that is just south of the Fresno County line, and approximately two miles east of Interstate 5.

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) - COMPLIANCE

The Avenal Energy Project would be subject to all the same laws, ordinances regulations and standards (LORS) as previously analyzed and approved in the Final Decision, in addition to the federal PSD requirement for greenhouse gases (GHG) and the revisions to the National Ambient Air Quality Standards (NAAQS) for 1-hour averages of nitrogen dioxide (NO₂) and sulfur dioxide (SO₂). The Avenal Energy Project would also be subject to the most current ATCM and NSPS since the Final Decision.

The San Joaquin Valley Air Pollution Control District (SJVAPCD) issued a Final Determination of Compliance (FDOC) on October 30, 2008 and issued an Alternative Final Determination of Compliance (SJVAPCD 2010) on December 17, 2010 that retains the original FDOC but also incorporates the requested changes to allow operation as a minor PSD stationary source. Staff understands that the facility owner intends to decide which FDOC to use prior to the start of construction, if the amendment is approved by the Energy Commission. The original FDOC and the Alternative FDOC both concluded that the project would comply with all LORS. The environmental impacts assessment presented herein shows there will be no significant environmental impacts associated with the requested modifications in the petition to amend, and the project as modified would comply with all applicable LORS.

SETTING

The federal and state ambient air quality attainment designations for all pollutants in the vicinity of the Avenal Energy Project and Kings County remain the same (ARB 2012) as analyzed in the Energy Commission's Final Decision. The proposed amendment would reduce annual emissions of NO_x and CO from the Avenal Energy Project, making the Avenal Energy Project a minor PSD stationary source for attainment criteria pollutants,

therefore decreasing impacts as analyzed and approved in the Energy Commission's Final Decision dated December 2009.

Air Quality Table 1 compares the previous maximum background concentrations as analyzed in the Energy Commission Final Decision to the current maximum background concentrations (2009-2011) to assess current conditions and potential impacts. Staff uses the highest locally measured background ambient air concentrations as the baseline in staff's analysis of potential ambient air quality impacts for the proposed amendment to the Avenal Energy project. The Final Staff Assessment used the Hanford and Corcoran monitoring stations for ozone, PM10, and PM2.5. Data from the Hanford, Visalia, and Sacramento monitoring stations were used for CO, NO₂, and SO₂, respectively.

**Air Quality Table 1
Highest Local Background Concentrations**

| Pollutant | Averaging Time | Limiting Standard | Previous Background (2006-2008) | Previous Percent of Standard | Current Background (2009-2011) | Current Percent of Standard |
|-------------------------------|-----------------|-------------------|---------------------------------|------------------------------|--------------------------------|-----------------------------|
| Ozone (ppm) | 1 hour | 0.09 | 0.127 | 141 | 0.131 | 146 |
| | 8 hour | 0.07 | 0.101 | 144 | 0.113 | 161 |
| PM10 (µg/m³) | 24 hour | 50 | 351 | 702 | 149.9 | 300 |
| | Annual | 20 | 59.5 | 298 | 43.5 | 218 |
| PM2.5 (µg/m³) | 24 hour | 35 | 75 | 214 | 75.7 | 216 |
| | Annual | 12 | 18.4 | 153 | 17.9 | 149 |
| CO (µg/m³) | 1 hour | 23,000 | 4,222 | 18 | 2,300 | 10 |
| | 8 hour | 10,000 | 2,900 | 29 | 1,678 | 17 |
| NO₂ (µg/m³) | 1 hour | 339 | 137.2 | 40 | 103.58 | 31 |
| | National 1 hour | 188 | NA | NA | 103.15 | 55 |
| | Annual | 57 | 22.6 | 40 | 17.1 | 30 |
| SO₂ (µg/m³) | 1 hour | 655 | 47.2 | 7 | 13 | 2 |
| | National 1 hour | 196 | NA | NA | 8 | 4 |
| | 24 hour | 105 | 7.9 | 8 | 5 | 5 |
| | Annual | 80 | 2.6 | 3 | NA | NA |

Source: CEC 2009a and ARB 2012. Accessed June 2012.

For the purpose of this amendment staff used all of the same monitoring stations for each pollutant for comparison purposes with the exception of CO and NO₂ data. Data for CO was no longer available at the Hanford station so staff used the Bakersfield-Golden State Hwy monitoring station. Data from the nearby Hanford monitoring station has become available for NO₂ and the SJVAPCD used this data for air quality modeling. Staff selected these values as the most representative background concentrations and also for consistency purposes. The local ambient air quality data show continuing violations of ambient air quality standards for ozone, PM10, and PM2.5. **Air Quality Table 1** shows a slight increase in ozone concentrations, decreases in PM10

concentrations, a slight increase in 24 hour PM2.5 concentrations, and a slight decrease in annual PM2.5 concentrations.

ANALYSIS

Overview

APC is requesting to limit emissions of CO and NOx to levels below major PSD stationary source thresholds (100 tons per year [tpy]). **AQ-SC12** would limit facility emissions of CO and NOx to 98.96 tpy and 99.42 tpy, respectively. The minor PSD stationary source revision is not associated with hardware change. The emission reductions are accomplished by changing the annual operating profile. Emission reductions could be a result of fewer startup and shutdowns (especially cold startups), or fewer overall base load operating hours. **Air Quality Table 2** provides the CTG hourly emission rates for CO and NOx under different types of operation and provides the annual emissions for the auxiliary boiler, fire pump engine, and emergency standby generator.

**Air Quality Table 2
Emission Rates for CO and NOx**

| CTG Event | Emission Rates (lb/hr) | |
|------------------------------|------------------------|-------|
| | CO | NOx |
| Startup/Shutdown | 1000 | 160 |
| Steady State W/ Duct Fire | 10.6 | 17.2 |
| Steady State W/Out Duct Fire | 8.35 | 13.55 |
| Source | Emission Rates (tpy) | |
| | CO | NOx |
| Auxiliary Boiler | 0.86 | 0.26 |
| Fire Pump Engine | 0.01 | 0.05 |
| Emergency Standby Generator | 0.03 | 0.05 |

Source: SJVAPCD 2010 and CEC 2009.

Air Quality Table 3 provides five hypothetical operating scenarios in which the proposed annual emissions for CO and NOx could be achieved. The change in annual operating profile would likely reduce actual emissions of other criteria pollutants and GHGs, along with the annual operating capacity factor. It is unclear which of these scenarios actual project operation would resemble most, but a reduction in hours of operation and startup/shutdowns would be required. The reduction in emissions would have less impact than previously analyzed and approved for the Avenal Energy Project.

Air Quality Table 3

Both Turbines Combined - Hypothetical Operating Scenario

| Scenario | Hours of Operation Startup/Shutdown ^a | Hours of Operation Steady State W/ Duct Firing | Hours of Operation Steady State W/Out Duct Firing | Total Hours of Operation (including startup/shutdown hours) | Total Emissions (tons per year) Both Turbines Combined ^b | |
|----------|---|---|---|---|--|-------|
| | | | | | CO | NOx |
| 1 | 25 | 800 | 6,000 | 6,825 | 83.58 | 99.06 |
| 2 | 50 | 500 | 5,000 | 5,550 | 97.05 | 84.35 |
| 3 | 75 | 500 | 2,000 | 2,575 | 97 | 47.70 |
| 4 | 85 | 250 | 1,200 | 1,535 | 97.67 | 34.16 |
| 5 | 98 | 0 | 0 | 98 | 98 | 15.68 |

Source: Staff calculation derived from SJVAPCD 2010 and CEC 2009.

Notes:

a) 1 cold start = 6 hours duration and 1 hot start = 1.5 hours duration.

b) The hypothetical CTG operating profile provides a margin from the proposed emission limit of **AQ-SC12** to account for the emissions from the auxiliary boiler, fire pump engine, and emergency standby generator as presented in **Air Quality Table 2**. The limit in **AQ-SC12** is a facility-wide limit and does not pertain only to the CTGs.

The original maximum annual emissions for each CTG for CO were estimated assuming each CTG operated 624 hours in startup/shutdown mode ((1.5 hours per hot start x 208 hot starts per year) + (6 hours per cold start x 52 cold starts per year)), 800 hours operating while firing at full load with the duct burner, and 3,800 hours operating while firing at full load without the duct burner. **Air Quality Table 3** represents both turbines combined rather than a single turbine and shows substantially fewer hours of operation compared to the previously approved project.

Background

Since the original approval from the Energy Commission for the Avenal Energy Project on December 16, 2009, there have been a few revisions and additions to federal regulations that must be analyzed for this Petition to Amend. Specifically, there is a new federal PSD requirement for GHG emissions for projects constructed after July 1, 2011 and new NAAQS for 1-hour averages of NO₂ and SO₂. There have also been revisions to the Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

However, due to the lengthy delays in the U.S. EPA's permitting process for the Avenal Energy Project, the U.S. EPA issued a "Supplemental Statement of Basis", for the PSD permit application in March 2011 (EPA 2011) that specifically "grandfathered" the Avenal Energy Project from these new federal requirements. The "grandfathering" would exempt the Avenal Energy Project from having to demonstrate compliance with the new GHG, NO₂ and SO₂ requirements. A discussion of each new federal requirement is discussed below.

Greenhouse Gases (CO₂e)

Background

All projects starting construction after July 1, 2011 that emit more than 100,000 tons/year (tpy) of carbon dioxide equivalent (CO₂e) are subject to the GHG PSD review by the U.S. EPA. Avenal Energy Project as originally approved is expected to emit approximately 1,712,224 tpy CO₂e.

Analysis

The purpose of this amendment would allow Avenal Energy Project to operate as a minor source (not subject to PSD) for criteria pollutants. Operation as a minor PSD source for criteria pollutants may lead to lower GHG emissions; however the project would still be well over the 100,000 tpy GHG threshold. Although Avenal Energy Project would otherwise be subject to GHG PSD review, the “Supplemental Statement of Basis” “grandfathered” the Avenal Energy Project from the GHG PSD requirement as described in the overview above. Therefore, as long as the “Supplemental Statement of Basis” remains valid and is acknowledged, the Avenal Energy Project would be exempt from the GHG PSD review.

1-Hour NO₂ NAAQS

Background

On January 22, 2010, EPA revised the primary NO₂ NAAQS in order to provide requisite protection of public health. Specifically, EPA has established a new 1-hour standard at a level of 100 parts per billion (ppb) (188 µg/m³ [micro grams per meter cubed]), based on the 3-year average of the 98th percentile of the daily maximum 1-hour concentrations.

Analysis

In the Alternative FDOC, the SJVAPCD evaluated the project’s NO₂ emissions in light of the new standard. The analysis was based on maximum hourly emissions, which remain the same whether the project operates as a major PSD stationary source or a minor PSD stationary source. This is because the changes are associated with a changed operating profile, not hardware changes.

The modeling results presented in the Alternative FDOC followed the procedure outlined in the District’s interim draft guidance document entitled “Modeling Procedure to Address the New Federal 1 Hour NO₂ Standard” (SJVAPCD 2010a). **Air Quality Table 4** provides the modeling results as analyzed by the SJVAPCD.

The SJVAPCD modeling results show compliance using the Tier III modeling approach. This approach used the Plume Volume Molar Ratio Method (PVMRM), which determines the conversion rate for NO_x to NO₂ based on a calculation of the number of NO_x moles emitted into the plume, and the number of O₃ moles contained within the volume of the plume between the source and receptor. The PVMRM method assumes an upper bound for the ambient NO₂/NO_x ratio. This default ambient ratio is 0.9.

Air Quality Table 4

SJVAPCD Ambient Air Quality Analysis 1-Hour NO₂ NAAQS

| Modeling Approach | Modeling μg/m ³ | Design Value μg/m ³ | Impact μg/m ³ | NAAQS Limit μg/m ³ | Pass/Fail | Margin Relative to Standard μg/m ³ |
|---------------------|-------------------------------|--------------------------------------|-----------------------------|-------------------------------------|-----------|--|
| Tier I (max Year) | 152.79 | 103.15 | 255.94 | 188.68 | F | -67.26 |
| Tier II (max 8th) | 87.94 | 103.15 | 191.09 | 188.68 | F | -2.41 |
| Tier III (ave. 5yr) | 82.43 | 103.15 | 185.58 | 188.68 | P | 3.1 |
| Tier IV | NA | | NA | 188.68 | P | NA |

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | Max |
|-------------------|--------|-------|-------|-------|-------|--------|
| Tier I (max yr) | 152.79 | 91.15 | 93.47 | 93.24 | 90.56 | 152.79 |
| Tier II (max 8th) | 87.79 | 86.35 | 86.51 | 87.38 | 87.94 | 87.94 |

Source: SJVAPCD 2010, Attachment G.

For the Tier III modeling approach the 5-year average of the 98th percentile was determined from the modeling results and added to the background design value. The processes to determine these values are described below.

Tier III Modeling Approach

- At each receptor, for each calendar year in the five-year analysis period, the 98th percentile daily maximum 1-hour NO₂ concentration was determined. Because EPA and SJVAPCD guidance are used to develop a complete data set (i.e., 365 valid days), the 98th percentile corresponds to the 8th highest daily maximum 1-hour concentration.
- At each receptor, the 98th percentile daily maximum 1-hour concentrations were averaged across the five-year period of available data.
- The five-year average of the 98th percentile was determined by selecting the highest concentration across all receptors. This is defined as the highest of the average 8th-highest (98th percentile) concentrations derived by the model across all receptors in the five-year period.

Design Value

- The design value is a 3 yr average of the 98th percentile of the annual distribution of the daily maximum 1-hour average concentration (monitored values).

The meteorological data used for the air dispersion modeling to demonstrate compliance with the 1-hour NO₂ NAAQS was obtained from the Hanford monitoring

station for the years of 2004 through 2008. The coinciding NO₂ and ozone data were also selected from the Hanford monitoring station for the years 2004 through 2007 and from the Visalia monitoring station for 2008 because data was not available at the Hanford station for that year.

The result of this analysis is that the project would not cause or contribute to any exceedances of the federal 1-hour NO₂ standard.

1-Hour SO₂ NAAQS

Background

On August 23, 2010 a new 1-hour average NAAQS for SO₂ went into effect (EPA 2010). To attain the 1-hour national standard, the 3-year average of the 99th percentile of the 1-hour daily maximum concentrations at each receptor must not exceed 196 µg/m³.

Analysis

Regardless of whether the project operates as a major or minor PSD stationary source, modeling completed in the Final Commission Decision showed results well below this standard. The current national 1-hour SO₂ maximum background concentration (2009-2011) as shown in **Air Quality Table 1** of 8 µg/m³ paired with the originally modeled project impact of 9.7 µg/m³ creates a total impact of 17.7 µg/m³. This impact is well below the new 1-hour NAAQS for SO₂ of 196 µg/m³.

Minor Equipment Changes

Background

The Energy Commission's Final Decision approved the Avenal Energy Project on December 16, 2009 and determined that with the adoption of the conditions of certification, the Avenal Energy project would likely conform with applicable federal, state and SJVAPCD air quality LORS, and that the proposed Avenal Energy project would not result in significant air quality related impacts. Since the original Energy Commission Decision ATCM and NSPS standards have become more stringent for stationary ignition compression engines.

Analysis

In light of the more stringent emission limits for the fire pump engine staff recommends that the Energy Commission require APC to use the latest model diesel fire pump engine available at the time construction is initiated or equipment is purchased. Changes to **AQ-110** and **AQ-111** and related equipment descriptions are necessary to comply with the current requirements of 40 CFR Part 60, Subpart IIII (Compression Ignition New Source Performance Standards). Subpart IIII includes a NMHC+NO_x emission limit of 3.0 g/bhp-hr. The Project's currently approved 288-hp diesel fuel-fired (compression engine) emergency fire water pump engine (Clarke model JW6H-UF40) may exceed this emission limit. Therefore, APC proposes to substitute this engine with the Cummins Model CFP9E-F40, a Tier 3 compliant engine. In achieving the lower NO_x emission limit, the new engine would have slight increases of CO and PM₁₀ (but would still remain below the respective standards). These increases of CO and PM₁₀ amount

to approximately 30.79 and 1.87 pounds per year, respectively, and continue to be offset by the original offset package as required in the Final Commission Decision.

CONCLUSIONS AND RECOMMENDATIONS

Staff recommends approval of the requested changes for the Avenal Energy Project. All requested project modifications would continue to comply with all applicable LORS. The change in operation in the Petition to Amend would decrease emissions of NO_x and CO from 144.3 tpy and 602.7 tpy to 99.4 tpy and 98.96 tpy respectively (**AQ-SC12**), making the project a minor PSD stationary source for criteria pollutants, with lower emissions than previously analyzed and approved in the Energy Commission's Final Decision for the Avenal Energy Project. The changes to **AQ-6** and **AQ-71** identify reissued air district emission reduction credit (ERC) certification numbers; the changes to **AQ-110** and **AQ-111** modify emission limits necessary to meet the current Airborne Toxic Control Measures (ATCM) and Federal New Source Performance Standards (NSPS) for stationary compression ignition engines; and the changes to **AQ-122** conforms the equipment description to the equipment analyzed by staff in the Final Commission Decision.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

The following language, equipment descriptions, and Conditions of Certification would be amended in the Final Commission Decision for the Avenal Energy Project to ensure compliance with all LORS. ~~Strikethrough~~ is used to indicate deleted language and **underline** for new language.

AQ-SC12 Annual emissions from the facility, calculated monthly on a 12-month rolling basis, shall not exceed any of the following limits: NO_x (as NO₂) – 198,840 lb/year; CO – 197,928 lb/year. [District Rule 2201] AQ-SC12 only applies if the facility commences construction under the FDOC issued December 17, 2010 and will become void if and when the project obtains a PSD permit that is no longer subject to appeal, and construction commences under that PSD permit. AQ-SC12 will also become void if the project obtains a final, non-appealable PSD permit after initiation of construction and obtains a modified FDOC or equivalent permit from the District that allows operation as a major PSD source.

Verification: A summary of significant operation and maintenance events and required monitoring records shall be included in the quarterly operation report (AQ-SC8), including 12-month rolling totals calculated monthly for NO_x (as NO₂) and CO emissions.

AQ-6 ERC certificate numbers (or any splits from these certificates) C-897-1, C-898-1, N-724-1, N-725-1, **S-2988-1 (reissued from S-2812-1), S-2951-1 (reissued from S-2813-1),** S-2817-1, C-899-2, C-902-2, N-720-2, N-722-2, N-726-2, N-728-2, S-2814-2, S-2321-2, C-896-4, N-721-4, N-723-4, S-2791-5, S-2790-5, S-2789-5, S-2788-5, or N-

762-5 shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this determination of compliance (DOC) shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of the DOC. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM records showing that the project's offset requirements have been met prior to initiating operation.

AQ-71 ERC certificate numbers (or any splits from these certificates) C-897-1, C-898-1, N-724-1, N-725-1, **S-2988-1 (reissued from S-2812-1), S-2951-1 (reissued from S-2813-1)**, S-2817-1, C-899-2, C-902-2, N-720-2, N-722-2, N-726-2, N-728-2, S-2814-2, S-2321-2, C-896-4, N-721-4, N-723-4, S-2791-5, S-2790-5, S-2789-5, S-2788-5, or N-762-5 shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this determination of compliance (DOC) shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of the DOC. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM records showing that the project's offset requirements have been met prior to initiating operation.

AQ-110 Emissions from this IC engine shall not exceed any of the following limits: ~~3.422~~ g-NO_x/bhp-hr, ~~0.447~~**1.417** g-CO/bhp-hr, or ~~0.380~~**0.123** g-VOC/bhp-hr. [District Rule 2201 and 13 CCR 2423 and 17 CCR 93115]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-111 Emissions from this IC engine shall not exceed ~~0.059~~**0.118** g-PM₁₀/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 13 CCR 2423 and 17 CCR 93115]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQSC8**).

AQ-122 This IC engine shall be equipped with a three-way catalyst, **combined SCR/oxidation catalyst, or equivalent control system.** [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission upon request.

Avenal Power requests administrative changes to the following equipment description:

EQUIPMENT DESCRIPTION, UNIT C-3953-13-0:

288 Bhp ~~Clarke~~Cummins Model ~~Jw6h-Uf40~~CFP83-F40 or equivalent Diesel-Fired Emergency IC Engine Powering A Fire Pump

EQUIPMENT DESCRIPTION, UNIT C-3953-14-0

860 Bhp Caterpillar Model ~~3456~~G3512LE or equivalent Natural Gas-Fired Emergency IC Engine Powering ~~With Non-Selective Catalytic Reduction (Nscr)~~ Powering A ~~500~~550 Kw Electrical Generator

REFERENCES

AEP 2010. Avenal Energy Project, Air Dispersion Modeling Protocol Revised Supplemental NO₂ Air Quality Impact analysis, September 13, 2010.

ARB 2012. California Air Resources Board, Air Quality Data. Available at: <http://www.arb.ca.gov/adam/welcome.html>

Avenal Power 2012. Avenal Energy Project (08-AFC-1C), Petition to Amend to Allow Construction and Operation of the Avenal Energy Project as a Minor Source, March 5, 2012.

CEC 2009. California Energy Commission, Final Commission Decision on the Application for Certification for the Avenal Energy Project (08-AFC-1), December 2009.

DC 2011. United States District Court for the District of Columbia, Avenal Power, LLC, v. U.S. Environmental Protection Agency, May 26, 2011.

EPA 2010. U.S. Environmental Protection Agency, General Guidance for Implementing the 1-hour SO₂ National Ambient Air Quality Standard in Prevention of Significant Deterioration Permits, Including an Interim 1-hour SO₂ Significant Impact Level, August 23, 2010. <http://www.epa.gov/region7/air/nsr/nsrmemos/appwso2.pdf>

EPA 2011. U.S. Environmental Protection Agency, "Supplemental Statement of Basis for the PSD Permit Application for Avenal Energy Project", March 2011.

SJVAPCD 2010. San Joaquin Valley Air Pollution Control District, Alternative Final Determination of Compliance, December 17, 2010.

SJVAPCD 2010a. San Joaquin Valley Air Pollution Control District, Modeling Procedure to Address the New Federal 1 Hour NO₂ Standard, February 19, 2010.