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CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

DATE: February 3, 2014

TO: Interested Parties

FROM: Bruce Boyer, Compliance Project Manager

SUBJECT: Almond 2 Power Plant (09-AFC-2C)
Staff Analysis of Proposed Modifications to Air Quality Conditions of Certification

On February 22, 2013, Turlock Irrigation District (TID) filed a petition with the California Energy Commission (Energy Commission) to amend the December 15, 2010, Energy Commission Final Decision for the Almond 2 Power Plant (A2PP). On June 17, 2013, TID requested that additional modifications be added to the February 22, 2013, petition.

The A2PP is a 174-megawatt (MW) simple-cycle peaking power plant, located in the City of Ceres, in Stanislaus County. The project was certified by the Energy Commission on December 15, 2010, and began commercial operation on July 13, 2012.

The proposed modifications to Air Quality Conditions of Certification would allow A2PP: (1) to delete the requirement that the fuel flow meter be non-resettable and totalizing; (2) to allow the testing of compliance with startup and shutdown emission limits to a single representative turbine; (3) and to modify or delete conditions that regulate certain activities with reference to construction and commissioning periods.

Energy Commission staff reviewed the petition and assessed the impacts of the proposed changes on environmental quality and on public health and safety. Staff recommends modifications to existing Air Quality Conditions of Certification **AQ-1, 11, 12, 13, 14, 15, 16, 19, 20, 41, 42, 47, 65, 66, 67, 68, 69, 70,** and **71**. It is staff's opinion that, with the implementation of the modified conditions, the A2PP would remain in compliance with applicable laws, ordinances, regulations, and standards and that the proposed modifications would not result in significant adverse direct or cumulative impacts to the environment (Cal. Code Regs., tit. 20, § 1769).

The amendment petition and staff's analysis have been posted on the Energy Commission's A2PP webpage at http://www.energy.ca.gov/sitingcases/almond/. The Energy Commission's Order regarding this petition will also be posted on the webpage. Energy Commission staff intends to recommend approval of the petition at the March 12, 2014, Business Meeting of the Energy Commission.

Agencies and members of the public who wish to provide comments on the Staff Analysis are asked to submit their comments prior to March 3, 2014, using the Energy Commission's e-commenting feature, by going to the Energy Commission's A2PP webpage http://www.energy.ca.gov/sitingcases/almond/ and clicking on the "Submit e-

Comment" link. A full name, e-mail address, comment title, and either a comment or an attached document (in the .doc, .docx, or .pdf format), are mandatory. After entering CAPTCHA (a challenge-response test used to ensure that responses are generated by a human user and not a computer), click on the "Agree & Submit Your Comment" button to submit the comment to the Energy Commission Dockets Unit. Written comments may also be mailed or hand delivered to:

California Energy Commission
Dockets Unit, MS-4
Docket No. 09-AFC-2C
1516 Ninth Street
Sacramento, CA 95814-5512

All comments and materials filed with the Dockets Unit will become part of the public record of the proceeding.

If you have any questions, please contact Bruce Boyer, Compliance Project Manager, at (916) 653-7181, or by fax to (916) 654-3882, or via e-mail at: bboyer@energy.ca.gov

If you desire information on participating in the Energy Commission's review of the project, please contact the Energy Commission's Public Adviser at (916) 654-4489, or at (800) 822-6228 (toll free in California). 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.ca.gov.

Mail List # **7352**

ALMOND 2 POWER PLANT (09-AFC-2C)
Petition to Amend Commission Decision
Executive Summary
Bruce Boyer

INTRODUCTION

On February 22, 2013, Turlock Irrigation District (TID) filed a petition with the California Energy Commission (Energy Commission) requesting to modify the Final Decision (Decision), for the Almond 2 Power Plant (A2PP). On June 17, 2013, TID requested that additional modifications be added to the February 22, 2013, petition. Staff has completed its review of all materials received.

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

This Staff Analysis contains the Energy Commission staff's evaluation for the technical area of Air Quality.

PROJECT LOCATION AND DESCRIPTION

The A2PP is a nominal 174-megawatt (MW) simple-cycle facility, certified by the Energy Commission on December 15, 2010. It began commercial operation on July 13, 2012.

The A2PP is located in the City of Ceres, in Stanislaus County.

DESCRIPTION OF, AND NECESSITY FOR, THE PROPOSED MODIFICATIONS

Proposed modifications to Air Quality Conditions of Certification **AQ-1**, **11**, **12**, 1**3**, **14**, **15**, **16**, **19**, **20**, 4**1**, **42**, **47**, **65**, **66**, **67**, **68**, **69**, **70**, and **71** would:

- Allow the testing of a single turbine to demonstrate compliance with startup and shutdown emission limits;
- Clarify the descriptive language regarding fuel flow meter requirements;
- Delete all irrelevant conditions pertaining to construction and commissioning; and
- Make certain clarifications and administrative amendments.

STAFF'S ASSESSMENT OF THE PROPOSED PROJECT CHANGES

Energy Commission technical staff reviewed the petition to amend for potential environmental effects and consistency with applicable LORS. Staff has determined that

the technical or environmental areas of Biological Resources, Cultural Resources, Hazardous Materials Management, Facility Design, Land Use, Noise and Vibration, Paleontological Resources, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Transmission System Engineering, Visual Resources, Waste Management, and Worker Safety and Fire Protection would not be affected by the proposed changes, and no revisions or new conditions of certification are needed to ensure the project would remain in compliance with all applicable LORS. Staff's conclusions reached in each technical area are summarized in **Executive Summary Table 1**, below.

Staff determined that the technical area of Air Quality would be affected by the proposed changes and that revisions to some Air Quality Conditions of Certification would be needed to ensure the project would remain in compliance with all applicable LORS. The Air Quality analysis that follows this Executive Summary provides the details of the recommended staff revisions to the existing A2PP Decision and conditions of certification. Air Quality staff believes that by making the recommended changes to the existing Air Quality Conditions of Certification, the potential impacts of the project owner's proposed changes would be reduced to less than significant levels.

Staff has determined that Air Quality Conditions of Certification:

- **AQ-1** should be modified to reflect current San Joaquin Valley Air Pollution Control District (SJVAPCD) procedural requirements;
- **AQ-11** through **AQ-16**, and **AQ-65** through **AQ-71**, are no longer relevant and staff recommends deleting them;
- **AQ-19** and **AQ-20** should be modified to update the requirements to reflect the transition from construction to commissioning and operation;
- **AQ-41** should be modified to allow testing of a single turbine to demonstrate compliance with startup and shutdown emission limits and to remove references to the commissioning period;
- **AQ-42** should be modified to delete references to the commissioning period; and
- **AQ-47** descriptive language regarding the fuel flow meter should be changed.

Executive Summary Table 1
Summary of Impacts to Each Technical Area

TECHNICAL AREAS REVIEWED	STAFF RESPONSE			Revised Conditions of Certification Recommended
	Technical Area Not Affected	No Significant Environmental Impact*	Process As Amendment	
Air Quality			**X**	**X**
Biological Resources	**X**			
Cultural Resources	**X**			
Hazardous Materials Management	**X**			
Facility Design	**X**			
Land Use	**X**			
Noise and Vibration	**X**			
Paleontological Resources	**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 proposed modifications would have a significant effect on the environment, and the modifications would not result in a change in or deletion of a condition adopted by the Commission in the Final Decision, or make changes that would cause project noncompliance with any applicable laws, ordinances, regulations, or standards (20 Cal. Code Regs., § 1769 (a)(2)).

STAFF RECOMMENDATIONS AND CONCLUSIONS

Staff concludes that the following required findings, mandated by Title 20, section 1769 (a)(3) of the California Code of Regulations, can be made, and staff recommends approval of the petition by the Energy Commission:

A. The modifications would not change the findings in the Energy Commission's Final Decision pursuant to Title 20, California Code of Regulations, section 1755;

B. There would be no new or additional, unmitigated significant environmental impacts associated with the proposed changes;

C. The facility would remain in compliance with all applicable laws, ordinances, regulations, and standards;

D. The changes would be beneficial to the project owner because conditions that are no longer relevant would be deleted or modified and startup and shutdown testing and fuel flow meter requirements would be clear.

ALMOND II POWER PLANT (09-AFC-2C)
Petition to Amend Commission Decision
Air Quality Analysis
Nancy Fletcher

INTRODUCTION

On February 22, 2013, Turlock Irrigation District (TID) filed a petition (TID 2013a) with the California Energy Commission (Energy Commission) requesting minor amendments to the Air Quality Conditions of Certification for the Almond II Power Plant (A2PP). The facility is a 174-megawatt (MW) natural gas-fired, simple-cycle, peaking generating facility located on a 4.6-acre parcel zoned for industrial use, 2 miles from the center of the City of Ceres and 5 miles south of Modesto in Stanislaus County. The facility consists of three 58-MW General Electric Energy LM6000PG turbines equipped with water injection and selective catalytic reduction (SCR) for nitrogen oxide (NOx) control. The facility operates as a peaking plant utilizing aeroderivative turbines designed for quick startups. The Energy Commission Decision approving the A2PP was issued on December 15, 2010.

TID is requesting revisions to the Air Quality Conditions of Certification to clarify and amend specific testing and monitoring requirements for the three turbines. Condition of Certification **AQ-41** requires source testing of each turbine to measure startup and shutdown mass emission rates and a Relative Accuracy Audit (RAA) for the continuous emission monitoring system (CEMS). The testing is required upon initial operation and at least once every seven years thereafter. TID is requesting to amend the language of **AQ-41** to allow the required startup testing of a single turbine to satisfy this requirement. In addition, Condition of Certification **AQ-47** requires the use of a non-resettable, totalizing fuel flow meter. TID is requesting to amend the language of **AQ-47** to remove the description, “non-resettable, totalizing,” and replace it with, “meets the requirements of 40 Part 75” which requires each turbine to operate with CEMS.

TID submitted a request to the San Joaquin Valley Air Pollution Control District (SJVAPCD) on December 19, 2012, to incorporate these changes into the SJVAPCD conditions for A2PP. The SJVAPCD evaluated the proposed changes, and the proposal underwent a 30-day public comment period and 45-day Environmental Protection Agency (EPA) comment period, beginning in early April, 2013. The SJVAPCD received no comments regarding the proposed changes and issued an Authority to Construct (ATC) for each turbine along with a Certificate of Conformity in accordance with 40 CFR Part 70. Subsequently, TID submitted an application to the SJVAPCD to modify the facility’s federal Title V operating permit to incorporate these changes. On June 25, 2013, the SJVAPCD sent notice to TID that the changes were incorporated into the A2PP’s Title V operating permit. In addition to TID’s requested amendments, SJVAPCD made additional changes to the conditions in the three turbine ATCs and Title V Operating Permit for the facility. Specifically, SJVAPCD deleted or modified conditions that pertained to construction and/or commissioning. On June 17, 2013, TID requested these additional condition modifications from SJVAPCD be incorporated into the Energy Commission’s Conditions of Certification and Decision.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS COMPLIANCE

The SJVAPCD reviewed the requested modifications and determined the changes would comply with their regulations. The facility owner submitted the engineering evaluation of the proposed changes to Energy Commission staff for review. The SJVAPCD analysis identified the air quality laws, ordinances, regulations and standards (LORS), included in **Air Quality Table 1** below, as applicable to the proposed amendment and all were addressed in the original Energy Commission Decision. There are no new applicable LORS.

Air Quality Table 1
San Joaquin Valley Air Pollution Control District
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Regulation I, General Provisions	Establishes the requirements and standards for stack monitoring (Rule 1080), source sampling (Rule 1081), and breakdown events (Rule 1100); identifies penalties for violations.
Regulation II, Permits	Establishes the regulatory framework for permitting new and modified sources. Included in these requirements are the federally delegated requirements for new source review (NSR), the Title V Operating Permit Program, and the Title IV Acid Rain Program.
Rule 2010, Permits Required	Requires any person constructing, altering, replacing, or operating any source operation which emits, may emit, or may reduce emissions to obtain an Authority to Construct and a Permit to Operate, unless exempted by Rule 2020.
Rule 2201, New and Modified Stationary Sources	Establishes the pre-construction review requirements for new, modified, or relocated emission sources, in conformance with NSR to ensure that these facilities do not interfere with progress in attainment of ambient air quality standards and that future economic growth in the San Joaquin Valley is not unnecessarily restricted. This regulation establishes Best Available Control Technology (BACT) and emission offset requirements. The proposed modification does not include any new emissions unit or relocation of equipment, would not result in an adjusted increase in the permitted emissions exceeding 2.0 pounds in any one day, and would not be considered a SB 288 Major Modification or Federal Major Modification (as defined in 40 CFR 51.165). Therefore BACT is not triggered. The proposed modifications would not result in any emission increase; therefore additional offsets would not be required.
Rule 2410, Prevention of Significant Deterioration	Incorporates federal Prevention of Significant Deterioration (PSD) program requirements for major sources in areas that are in attainment or unclassified for a federal criteria pollutant. The requested modifications would not result in any emission increase; therefore the A2PP would not result in an exceedance of any of the PSD thresholds and PSD does not apply.
Rule 2520, Federally Mandated Operating Permits	Establishes the permit application and compliance requirements for the federal Title V permit program. The proposed modifications triggered a 30-day public notice with EPA. The SJVAPCD submitted the Authorities to Construct (ATCs) to EPA for review. The ATCs were issued with Certificates of Conformity after EPA review in the Title V permit for the facility.TID received the amended Title V Operating Permit on June 27, 2013.

Applicable Law	Description
Rule 2540, Acid Rain Program	Implements the federal Title IV Acid Rain Program that requires subject facilities to obtain emission allowances for SO_x emissions and requires fuel sampling and/or continuous monitoring to determine SO_x and NO_x emissions.
Rule 2550, Federally Mandated Pre construction Review for Major Sources of Air Toxics	Establishes requirements for a new or reconstructed facility to be classified as a major air toxics source.
Rule 4001, New Source Performance Standards	Specifies that a project must meet the requirements of the Federal New Source Performance Standards (NSPS), according to Title 40, Code of Federal Regulations, Part 60. The specific NSPS subparts that are applicable include: • Subpart GG—Standards of Performance for Stationary Gas Turbines • Subpart KKKK—Standards of Performance for Stationary Combustion Turbines
Rule 4002, National Emission Standards for Hazardous Air Pollutants	Incorporates the National Emission Standards for Hazardous Air Pollutants (NESHAPs) from, Chapter I, Subpart C, Title 40 CFR Parts 61 and 63 and applies them to sources of HAPs.
Rule 4101, Visible Emissions	Prohibits visible air emissions, other than water vapor, of more than No. 1 on the Ringelmann chart or 20 percent opacity for more than three minutes in any one hour.
Rule 4102, Nuisance	Prohibits any emissions which cause injury, detriment, or public nuisance.
Rule 4201-4202, Particulate Matter Concentration/Emission Rate	Limits particulate emissions from any source that emits or may emit dust, fumes, or total suspended particulate matter.
Rule 4301, Fuel Burning Equipment	Limits the concentrations of combustion contaminants and specified emission rates from any fuel burning equipment.
Rule 4703, Stationary Gas Turbines	Limits the proposed stationary gas turbine emissions of NOx to 3 ppmv and carbon monoxide (CO) to 25 ppmv over a 3-hour averaging period. Provided certain demonstrations are made, the emission limits do not apply during startup, shutdown, or reduced load periods (defined as “transitional operation periods”).
Rule 4801, Sulfur Compounds	Limits oxides of sulfur (SOx) emissions to no greater than 0.2 percent by volume calculated as sulfur dioxide ($SO_{2)}$ on a dry basis averaged over 15 consecutive minutes.
Regulation VIII, Fugitive PM10 Prohibition	Sets forth the requirements and performance standards for the control of fugitive PM10 emissions from various sources.

SETTING

The A2PP is located in the City of Ceres, in Stanislaus County, within the San Joaquin Valley Air Basin. The SJVAPCD has jurisdiction over seven full counties and one partial county that are within the San Joaquin Valley Air Basin in California’s Central Valley. The existing land uses surrounding the A2PP site are primarily industrial, agricultural, and rural residential. For convenience, staff includes **Air Quality Table 2**, which summarizes the area's current attainment status for state and federal air quality standards for the SJVAPCD. The area is classified as non-attainment for ozone (state and federal), particulate matter less than 10 microns in diameter (PM10) (federal) and particulate matter less than 2.5 microns in diameter (PM2.5) (state and federal).

Air Quality Table 2
Current Federal and State Attainment Status, San Joaquin Valley Air Basin

Pollutant	State Classification	Federal Classification
Ozone (O_3) (1-hour and 8-hour)[a]	**Non-attainment**	**Non-attainment**
Carbon Monoxide (CO)	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment/Unclassified
Sulfur Dioxide (SO_2)	Attainment	Attainment/Unclassified
Particulate Matter Less Than 10 Microns In Diameter (PM10)	Attainment	**Non-attainment**
Particulate Matter Less Than 2.5 Microns In Diameter (PM2.5)	**Non-attainment**	**Non-attainment**

Source: http://www.valleyair.org/aqinfo/attainment.htm
[a] Federal designation reflects the 8-hour standard. The national 1-hour standard was revoked on June 15, 2005.

ANALYSIS

TID filed a petition to amend the Energy Commission Decision to change Conditions of Certification **AQ-41** and **AQ-47**. Specifically, these requested changes would allow testing of only one turbine to verify compliance with startup and shutdown mass emission rates of NOx, CO, and VOC and the deletion of language specifying that the fuel flow meter on each gas turbine must be non-resettable and totalizing. In addition, TID requested to remove requirements from the conditions of certification that are no longer applicable to the A2PP and to renumber the conditions of certification to match the numbering system used by the SJVAPCD.

Condition of Certification **AQ-41** requires source testing to measure startup and shutdown NOx, CO, and VOC mass emission rates before the end of the commissioning period and at least once every seven years thereafter. Condition of Certification **AQ-41** also requires a RAA to be performed on the CEMS for NOx and CO during startup and shutdown. The condition states that if the CEMS data are not certifiable to determine compliance with NOx and CO startup emission limits, then startup and shutdown NOx and CO testing shall be conducted every 12 months. Condition of Certification **AQ-41** references only startup and shutdown emissions. Condition of certification **AQ-42** requires initial testing of the emission rates of NOx, CO, VOC and ammonia (NH_3) before the end of commissioning and annually thereafter for normal operations. In addition, Conditions of Certification **AQ-52**, **53,** and **54** require ongoing CEMS testing for normal operations.

Each combustion turbine generator (CTG) has a separate exhaust stack and is equipped with CEMS for NOx, CO, and O_2. The conditions of certification require the CEMS to meet the installation, performance, relative accuracy, and quality assurance requirements specified in 40 CFR 60.13, Appendix B, and acid rain requirements specified in 40 CFR Part 75. Initial source testing of the units was performed in June, 2012. The testing included mass emissions testing and relative accuracy test audits (RATA) of all three units under normal operations. In addition, mass emission rates of NOx, CO and VOC and RAA testing was performed on only one of the units during

startup and shutdown conditions. However, Condition of Certification **AQ-41**, as provided in the SJVAPCD Final Determination of Compliance (FDOC) and as adopted by the Energy Commission, applies to each of the three turbines as noted in the paragraph preceding Condition of Certification **AQ-1** in the Decision.

The initial source testing was performed by a private independent company certified by the California Air Resources Board (ARB). The company used approved source test methods to collect the emissions data and test the responses of the CEMS. The conditions of certification require the submittal of a testing protocol to the SJVAPCD and the CPM for approval prior to the actual testing. The SJVAPCD approves the protocol according to SJVAPCD policy guidelines. The SJVACD source test policy guidelines require sample collection to be at least 30 minutes in duration. At A2PP, based upon CEMS data, start-up duration can be as short as 6 to 12 minutes and shutdown takes approximately the same amount of time. However, in order to capture emissions during both startup and shutdown conditions and verify compliance with the time frame of the emission limitation in the conditions of certification, the RAA runs were conducted for approximately one hour to cover a complete startup and shutdown sequence. The minimum test duration for relative accuracy tests required by the Code of Federal Regulations is 21 minutes. A RATA test requires nine passing sets of measurement data whereas a RAA only requires three passing sets of data measurements to determine CEMS accuracy.

Source testing methods and CEMS are designed for accuracy under relatively steady state operations, which generally occur during normal operations. However, during startup and shut down periods the exhaust flow is dynamic. The rapid changes in temperature, pressure, and air flow volume affect the algorithms used to collect operating parameter data and calculate emissions. This can affect the accuracy of the CEMS readings under these transient conditions. In addition, the dynamic nature of the exhaust flow can cause exhaust stack constituents to become stratified, or not well mixed.

Under normal operations, the test methods account for stack constituent stratification by requiring the test probe used for sample collection in the stack to be moved, or traversed, to different points to determine if emission data collected from different points within the stack are consistent. The probe is kept in one location for several minutes of data collection before moving it to the next points for data collection. The locations and number of traverse points are determined according to approved testing methods and are dependent on stack diameter and shape. If there is significant variation in the emission readings between the different points along the traverse, then the traverse technique is used for the duration of the test. Data collected from the different points during a traverse are combined to form a representative stack emissions profile.

Source testing during startup and shutdown conditions is challenging. Each startup sequence is a unique event and parameters affecting emissions can vary during each startup sequence. Two back-to-back startup sequences on the same turbine will not necessarily be identical, nor will startup sequences done in parallel on two identical turbines. The exact duration of the startup and shutdown events for the turbines at the peaking facility is not predetermined. The turbines can complete a startup sequence within approximately 12 minutes and a shutdown event typically takes under 10

minutes. For startup sequences, emissions tend to spike very quickly, level off, and then decline to levels corresponding to normal operating conditions. The emission rate limit in the conditions of certification is on a pound-per-hour basis for startup and shutdown. Hence, the duration of the emission testing and RAA test during startup and shutdown is longer than the actual operating startup and shutdown period. Therefore, the data acquired for the RAA and emissions testing include data from normal, or steady state, operation of the turbine.

Although the conditions present during startup and shutdown are conducive to stack stratification, a traverse was not required during the startup and shutdown sampling performed at A2PP in June, 2012. The short duration of these dynamic conditions and the changing conditions in the stack profile from each change of operation continually affect the emission profile, and a conventional traverse may not accurately capture the emission profile under these changing conditions. Therefore, the data captured during a startup/shutdown sequence might be representative of a specific spot in the stack but may not represent the entire emissions profile across the stack. Due to the dynamic conditions during startup and shutdown there are inherent inaccuracies with the source testing.

The combined inaccuracies of the source test and the CEMS readings during startup and shutdown operations as described above are of an unknown magnitude. The results of the startup and shutdown testing are not designed to determine compliance with a specific emission concentration in parts per million. Rather, the results of the tests are used to establish compliance with emission rates averaged over an hour (in pounds per hour) for NOx, CO, and VOC. The A2PP facility has CEMS for NOx and CO, and the intent of the RAA is to determine how well the readings of the CEMS represent source test readings taken directly in the stack. If the readings are within a specified range, then the CEMS data can be used to determine ongoing compliance with the allowable emission rates. If the readings fall outside this range, only the startup and shutdown source test emission rates are used to verify compliance with the allowable emission rates.

While there are limitations with source testing and CEMS readings during startup and shutdown operations, source testing, in combination with the RAA testing requirements, is the mechanism in place used to verify compliance with the conditions of certification. The startup and shutdown testing is required to validate the values used for startup and shutdown emission calculations and to satisfy SJVAPCD best available control technology (BACT) requirements. The FDOC identifies the pound-per-hour emission rate limitation during startup and shutdown operations, in conjunction with limitations on the duration of startup and shutdown events, as BACT for the turbines. Emission rates during startup and shutdown periods are not normally guaranteed by gas turbine vendors. The purpose of the startup and shutdown testing is to validate the values used for the startup emission calculations and the BACT analysis by determining if the equipment is operating in the expected range during these periods. Given the limitations in obtaining accurate emissions data during startup and shutdown events, testing only one of the three turbines during startup and shutdown conditions, along with the additional required emissions monitoring performed on all the units during normal operations, is acceptable to staff to satisfy the compliance requirements.

The SJVAPCD reviewed the owner's request to allow RAA testing of only one turbine during startup and shutdown, rather than testing each gas turbine, and incorporated the requested changes into their permit conditions. However, the district did not consider any requirement to rotate the turbine tested, or how to retest if a CTG CEMS fails the RAA test. Energy Commission staff believes that the turbine testing should be rotated and calls for this in the Verification for Condition of Certification **AQ-41**. This would ensure that each turbine would undergo startup and shutdown testing at some point, although the RAA testing is required only once in 7 years and it would take at least 21 years to test all three turbines. The facility owner expressed reservations with a requirement which would specify a particular unit to be tested per seven-year testing event because, although the turbines are designed for quick startups, there are other external parameters which affect the ability to bring a turbine on-line.

TID requested that the Verification language be drafted in a manner which would allow for testing flexibility in case conditions change, which may delay a specific unit from coming on-line to perform the testing. While all the turbines are RATA tested annually under normal operating conditions, RATA testing is not simultaneously performed with the startup and shutdown RAA testing. Conditions could change between testing events, delaying the ability to bring a specific unit on-line. Additionally the order of testing of the individual units is not necessarily prescribed in the source test protocol. Therefore, staff concluded the Verification could be written in a manner to require rotation from turbine-to-turbine, but allow some flexibility for the operator to change which turbine to test if conditions exist that would delay the testing of a specific unit. This gives the operator the needed flexibility to respond to the system changes during testing events while providing more comprehensive testing of all three turbines. In addition, placing this language in the Verification would allow flexibility for both TID and staff to rework the Verification language specifics at a separate time if needed.

If the tested turbine fails the RAA test, Energy Commission staff recommends that the Energy Commission requires the same turbine continue to be tested within the next 12 months rather than switching to another turbine. The purpose of the CEMS RAA test is to certify that the CEMS is accurately reading stack emissions. Therefore, if the CEMS unit for any particular turbine fails the once-in-7-year "certification" for startup and shutdown periods, then in essence it means the CEMS is not accurately recording the emissions during startup and shutdown periods. In that case, per Condition of Certification **AQ-48**, compliance with the startup and shutdown emission limitations is based on the startup and shutdown emission rates obtained from the source test data for CO and NOx, and not on the CEMS data. Condition of Certification **AQ-41** requires that the startup and shutdown testing then occur every 12 months until the CEMS is determined to certifiably represent emissions during startup and shutdown. Therefore, the 12-month testing requirement must clearly be tied to each specific turbine and CEMS unit that fails the RAA startup and shutdown certification. The RAA test must demonstrate the CEMS is reading accurately again, prior to the project owner being allowed to use the CEMS data to satisfy compliance with the emission requirements. As stated above, staff recommends the language in the verification for **AQ-41** clearly state this requirement.

Condition of Certification **AQ-47** currently requires each turbine to be equipped with non-resettable and totalizing flow meters to measure the amount of natural gas

combusted. The turbines are not currently equipped with mechanical fuel meters; however each turbine is equipped with a data acquisition and handling system to read the fuel flow. The flow meter requirement is derived from District Rules 2201 and 4703. District Rule 2201 is a new source review rule designed to meet both state and federal requirements. Federal requirements outlined in 40 CFR 60.4345 specify requirements for CEMS equipment. Paragraph (c) in this section requires a fuel flow meter to be installed, calibrated, maintained, and operated according to the manufacturer's specifications when a facility is using a NOx CEMS to comply with the requirements of CFR Part 60 Standards of Performance for New Stationary Sources. Paragraph (c) further states that flow meters meeting the requirements of 40 CFR Part 75 are acceptable for use under that subpart with state approval. District Rule 4703 requires monitoring of the type and quantity of the fuel used in each gas turbine system. TID requested the language regarding the fuel meter in A2PP Condition of Certification **AQ-47** be modified by removing the term "non-resettable and totalizing" from the requirement. They believe that their computer-based approach can be used to meet the same objective.

The purpose of the flow metering requirement is to ensure the system accurately records fuel used. The fuel used in each turbine is measured and totalized by a data acquisition and handling system. The flow meters reset to zero if there is a power outage or a crash. However, the data acquisition and handling system has long-term computer storage for the fuel records. These fuel records are unaffected by a reset caused by a power outage or crash. Energy Commission staff confirmed with TID that the equipment would not receive any fuel that would not be recorded in the data acquisition system. TID explained if conditions occurred that could result in the meters resetting to zero, such as a power outage or system crash, the turbines would not be able to operate. Therefore, TID confirmed that unrecorded fuel would not be delivered to the equipment under any circumstances. While the existing electronically-based fuel metering system may not be considered as non-resettable or totalizing, such as a mechanical meter installed on a fuel line typical of boilers and engines, it does meet the intent of the requirements. The SJVAPCD makes a case-by-case determination of whether or not each data acquisition and handling system satisfies the intended requirements. The SJVAPCD determined that the monitoring technique in place is equivalent to the intent of the existing requirement and, therefore, the proposed change to the language is not considered a relaxation of the monitoring requirement. The SJVAPCD made the requested edits but also added language in the condition stating that the fuel meters must meet the requirements of 40 CFR Part 75 to ensure the system complies with the applicable LORS.

In addition, TID is requesting to make changes to other Air Quality Conditions of Certification, deleting conditions that are no longer applicable, and renumbering the remaining conditions to be consistent with the changes made to the SJVAPCD permits. Commission staff recommends deleting the conditions that have been completed but does not recommend renumbering the conditions. Generally, the conditions of certification need to retain the assigned numbering system in order to prevent confusion in tracking A2PP compliance history. While staff makes every effort to ensure the conditions of certification and district permit conditions are consistent, renumbering the conditions is not compatible with the compliance process. TID is proposing to delete Conditions of Certification **AQ-11**, **12**, **13**, **14**, **15**, **16**, **65**, **66**, **67**, **68**, **69**, **70** and **71**. TID

is proposing to reword Conditions of Certification **AQ-1**, **41** and **42** by removing requirements that have already been completed. Finally, TID is requesting to combine and modify the language in Conditions of Certification **AQ-19** and **20**. The SJVAPCD has established a minimum catalyst face temperature of 540 degrees Fahrenheit and is requesting to insert the value into Condition of Certification **AQ-19**. Staff recommends deleting the current language in Conditions of Certification **AQ-11**, **12**, **13**, **14**, **15**, **16**, **65**, **66**, **67**, **68**, **69**, **70,** and**71** and replacing the existing text with the word "Deleted" in order to retain the numbering system. Staff also recommends modifying **AQ-1**, **19**, **20**, **41**, **42** and **47**, but keeping **AQ-19** and **20** as separately numbered conditions to facilitate tracking the history of these conditions.

CONCLUSIONS AND RECOMMENDATIONS

The California Energy Commission staff recommends approval of the request to modify the conditions to allow the testing of one turbine for startup and shutdown operations, to delete the requirement for the fuel meter to be non-resettable and totalizing, and to delete conditions of certification that are no longer applicable. However, staff recommends retaining the original numbering system for the Air Quality Conditions of Certification. The requested changes would conform with the applicable LORS related to Air Quality and would not result in significant Air Quality impacts. The requested changes to the condition language have already been adopted by SJVAPCD.

PROPOSED AND AMENDED CONDITIONS OF CERTIFICATION

Staff recommends the modification of the following existing air quality conditions of certification. **Bold underline** is used to indicate new language. ~~Strikethrough~~ is used to indicate deleted language.

AQ-1 ~~The permittee shall not begin actual on-site construction of the equipment authorized by this Authority to Construct until the lead agency satisfies the requirements of the California Environmental Quality Act (CEQA). [California Environmental Quality Act]~~ **The Authority to Construct N-3299-4-0 (or N-3299-4, N-3288-6-0) shall be converted into Permit to Operate prior to or concurrently with the implementation of this permit. [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.

AQ-11 ~~Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable steady state operation of the gas turbine and associated electrical delivery systems. [District Rule 2201]~~ **Deleted.**

Verification: ~~No verification necessary.~~

AQ-12 ~~Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a gas turbine is first fired, whichever occurs first. The commissioning~~

~~period shall terminate when the plant has completed initial source testing, completed final plant tuning, and is available for commercial operation. [District Rule 2201]~~ **Deleted.**

~~**Verification:** The project owner shall submit a commissioning plan to the CPM and APCO for approval at least 30 days prior to first firing of the gas turbine describing the procedures to be followed during the commissioning period and the anticipated duration of each commissioning activity.~~

AQ-13 ~~Emission rates from the gas turbine system during the commissioning period shall not exceed any of the following limits: NOx (as NO2) - 40.40 lb/hr and 969.6 lb/day; VOC (as CH4) - 8.41 lb/hr and 201.8 lb/day; CO - 40.00 lb/hr and 704.6 lb/day; PM10 - 2.50 lb/hr and 60.0 lb/day; or SOx (as SO2) - 1.56 lb/hr and 37.4 lb/day. [District Rule 2201]~~ **Deleted.**

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

AQ-14 ~~During commissioning period, NOx and CO emission rate shall be monitored using installed and calibrated Continuous Emission Monitoring Systems (CEMS). [District Rule 2201]~~ **Deleted.**

~~**Verification:** The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-12**.~~

AQ-15 ~~The total mass emissions of NOx, VOC, CO, PM10 and SOx that are emitted during the commissioning period shall accrue towards the quarterly emission limits. [District Rule 2201]~~ **Deleted.**

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

AQ-16 ~~During commissioning period, the owner or operator shall keep records of the natural gas fuel combusted in the gas turbine system on an hourly and daily basis. [District Rule 2201]~~ **Deleted.**

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

AQ-19 During all types of operation ~~(with an exception of ammonia injection tuning prior to the initial source test during the commissioning period)~~, including startup and shutdown periods, ammonia injection into the SCR system shall occur once the minimum temperature of **540˚F** at the catalyst face has been reached to ensure NOx emission reductions can occur with a reasonable level of ammonia slip. ~~The minimum catalyst face temperature shall be determined during the final design phase of this project and shall be submitted to the District at least 30 days prior to commencement of construction.~~ [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.

AQ-20 ~~The District shall administratively add the minimum temperature limitation established pursuant to the above Condition in the final Permit to Operate.~~ The District may administratively modify the temperature as necessary following any replacement of the SCR catalyst material. [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.

AQ-41 Source testing to measure startup and shutdown NO_X, CO, and VOC mass emission rates shall be conducted ~~before the end of the commissioning period and~~ at least once every seven years ~~thereafter~~ **on one of the three gas turbines (N-3299-4, '-5 or '-6)**. CEM**S** relative accuracy for NO_X and CO shall be determined during startup and shutdown source testing in accordance with 40 CFR 60, Appendix F (Relative Accuracy Audit). If CEM**S** data is not certifiable to determine compliance with NO_X and CO startup emission limits, then startup and shutdown NO_X and CO testing **on one of the three gas turbines** shall be conducted every 12 months. If an annual startup and shutdown NO_X and CO relative accuracy audit demonstrates that the CEM**S** data is certifiable, the startup and shutdown NO_X and CO testing frequency shall return to the once-every-seven-years schedule. [District Rule 1081]

Verification: **The project owner shall rotate the turbine tested for startup and shutdown operations until all of the units have been tested during startup and shutdown operations. If, however, the testing indicates the CEMS data is not certifiable, then the same turbine will be tested until the CEMS data is certifiable during startup and shutdown operations.** The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a preapproved protocol (**AQ-39**).

AQ-42 Source testing to determine compliance with the NOx, CO, VOC, and NH_3 emission rates (lb/hr and ppmvd @ 15% O_2) and PM10 emission rate (lb/hr) shall be conducted ~~before the end of commissioning period and~~ at least once every 12 months ~~thereafter~~. [District Rules 2201 and 4703, 40 CFR 60.4400(a)]

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a preapproved protocol (**AQ-39**). Testing for steady-state emissions shall be conducted upon initial operation and at least once every 12 months.

AQ-47 A ~~non-resettable, totalizing~~ mass or volumetric fuel flow meter to measure the amount of natural gas combusted in the unit shall be installed, utilized and maintained. [District Rule 2201 and 4703]

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

AQ-65 ~~Prior to operating under ATCs N-3299-4-0, N-3299-5-0 and N-3299-6-0, the permittee shall mitigate the following quantities of NO_X: 1st quarter: 34,905 lb,~~

~~2nd quarter: 35,292 lb, 3rd quarter: 35,682 lb, and 4th quarter: 35,682 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201]~~ **Deleted.**

~~**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-66 ~~NOx ERC S-3113-2 (or a certificate split from this certificate) shall be used to supply the required NOx offsets, unless a revised offsetting proposal is received and approved by the District. Following the revisions, this Authority to Construct permit shall be re-issued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to re-issuance of this Authority to Construct permit. [District Rule 2201]~~ **Deleted.**

~~**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-67 ~~Prior to operating under ATCs N-3299-4-0, N-3299-5-0 and N-3299-6-0, the permittee shall mitigate the following quantities of VOC: 1st quarter: 6,113 lb, 2nd quarter: 6,113 lb, 3rd quarter: 6,114 lb, and 4th quarter: 6,114 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201]~~ **Deleted.**

~~**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-68 ~~VOC ERC C-1008-1 (or a certificate split from this certificate) shall be used to supply the required VOC offsets, unless a revised offsetting proposal is received and approved by the District. Following the revisions, this Authority to Construct permit shall be re-issued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to re-issuance of this Authority to Construct permit. [District Rule 2201]~~ **Deleted.**

~~**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-69 ~~Prior to operating under ATCs N-3299-4-0, N-3299-5-0 and N-3299-6-0, the permittee shall mitigate the following quantities of PM10: 1st quarter: 13,506 lb, 2nd quarter: 13,507 lb, 3rd quarter: 13,507 lb, and 4th quarter: 13,507 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201]~~ **Deleted.**

~~**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-70 ~~SO_x ERC S-3129-5 (or a certificate split from this certificate) shall be used to supply the required PM10 offsets, unless a revised offsetting proposal is received and approved by the District. Following the revisions, this Authority to Construct permit shall be re-issued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to re-issuance of this Authority to Construct permit. [District Rule 2201]~~ **Deleted.**

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 ~~The District has authorized to use SO_x reductions to offset emissions increase in PM10 at SO_x/PM10 interpollutant offset ratio of 1.00. [District Rule 2201]~~ **Deleted.**

Verification: ~~No verification necessary.~~

REFERENCES

The tn: 00000 in a reference below indicates the transaction number under which the item is catalogued in the Energy Commission's Dockets Unit. The transaction number allows for quicker location and retrieval of individual items docketed for a case or used for ease of reference and retrieval of exhibits cited in briefs and used at hearings.

CEC 2010—California Energy Commission (tn 59270) Almond 2 Power Plant Project Commission Decision, docketed December 17, 2010.

SJVAPCD 2010—San Joaquin Valley Air Pollution Control District (tn 55530) Notice of Final Determination of Compliance (FDOC): Turlock Irrigation District (09-AFC-02), docketed February 22, 2010.

SJVAPCD 2013—San Joaquin Valley Air Pollution Control District, Authority to Construct Application Review, submitted March 11, 2013.

TID 2013a—Turlock irrigation District, Petition to Amend Air Quality Conditions of Certification for the Almond 2 Power Project, Amendment No.1 (tn 69643), submitted February 22, 2013.

TID 2013b—Turlock Irrigation District, Almond 2 Power Plant Condition AQ-SC6: Submittal of SJVAPCD Amended ATCs, submitted June 17, 2013.

TID 2013c—Turlock Irrigation District. Almond 2 Power Plant Condition AQ-SC6: Submittal of SJVAPCD Amended Title V Operating Permit, submitted July 2, 2013.