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DATE: May 2021

TO: Interested Parties

FROM: Joseph Douglas, Compliance Project Manager

SUBJECT: **Alamitos Energy Center (13-AFC-1C)**
Staff Analysis of Petition to Amend the Commission Decision

On April 4, 2019, AES Alamitos Energy, LLC (project owner), filed a petition with the California Energy Commission (CEC) requesting to modify the operating hours of the Alamitos Energy Center (AEC) project's Phase 1 combined-cycle gas turbines (CCGT) and a Phase 2 simple-cycle gas turbines (SCGT) to better reflect the expected demand by the electrical system.

AEC Phase 1 is an operating nominal 640-megawatt combined-cycle electric generating station located at 690 North Studebaker Road in the City of Long Beach. The 1,040 MW AEC project was certified by the Energy Commission on April 12, 2017 and began operations on February 6, 2020. Some common components for Phase 1 and Phase 2 have been constructed, but active construction on the 400 MW Phase 2 is not proceeding at this time.

CEC staff has reviewed the petition pursuant to Title 20, California Code of Regulations, section 1769 (Post Certification Amendments and Changes) and has concluded that the modifications to the CCGT and SCGT operating hours would not result in a significant impact on the environment, or cause the project to not comply with applicable laws, ordinances, regulations, and standards. Staff intends to recommend approval of the petition at the CEC's **June 9th** Business Meeting.

The CEC's webpage for this facility, https://ww2.energy.ca.gov/sitingcases/alamitos/index.html, has a link to the petition and the Staff Analysis on the right side of the webpage in the box labeled "Compliance Proceeding." Click on the "Documents for this Proceeding (Docket Log)" option. If approved, the CEC's Order approving this petition will also be available from the same webpage.

This letter has been mailed to the CEC's list of interested parties and property owners adjacent to the facility site. It has also been emailed to the Siting listserv. The listserv is an automated system by which information about this facility is emailed to parties who have subscribed. To subscribe, go to the CEC's webpage for this facility, cited above, scroll down the right side of the project's webpage to the box labeled "subscribe," and provide the requested contact information.

Any person may comment on the Staff Analysis. Those who wish to comment on the analysis are asked to submit their comments by June 4, 2021. To use the CEC's electronic commenting feature, go to the CEC's webpage for this facility, cited above, find the "Submit e-Comment" link, and follow the instructions in the on-line form. Be sure to include the facility name in your comments. Once submitted, the CEC Docket Unit reviews and approves your comments, and you will receive an email with a link to them.

Written comments may also be mailed to:

California Energy Commission
Docket Unit, MS-4
Docket No. **13-AFC-1C**
1516 Ninth Street
Sacramento, CA 95814-5512

All comments and materials filed with the Docket Unit will be added to the facility Docket Log and become publicly accessible on the Energy CEC's webpage for the facility.

If you have questions about this notice, please contact Joseph Douglas, Compliance Project Manager, at (916) 956-9527, or via email at joseph.douglas@energy.ca.gov.

For information on participating in the CEC's review of the petition, please contact the Public Advisor, at (916) 654-4489 or (800) 822-6228 (toll-free in California) or via e-mail at publicadvisor@energy.ca.gov.

News media inquiries should be directed to the CEC's Media Office at (916) 654-4989, or by e-mail to mediaoffice@energy.ca.gov.

Mail List: 7503
Listserv: Alamitos Energy Center listserv

ALAMITOS ENERGY CENTER (13-AFC-1C)
Petition to Amend Commission Decision
EXECUTIVE SUMMARY
Joseph Douglas

INTRODUCTION

On April 4, 2019, AES Alamitos Energy, LLC (project owner), filed a petition with the California Energy Commission (CEC) requesting to modify the operating hours of the Alamitos Energy Center (AEC) project's Phase 1 combined-cycle gas turbines (CCGT) and Phase 2 simple-cycle gas turbines (SCGT). The changes are necessary to increase combined-cycle gas turbine (CCGT) operating hours and decrease simple-cycle gas turbine (SCGT) operating hours to better reflect the expected demand by the electrical system. Other changes include project design features and revised non-cold startup NOx emission limit needed to comply with conditions of certification.

The purpose of the CEC's review process is to assess whether the proposed petition would have a significant impact on the environment or cause the project to not comply with applicable laws, ordinances, regulations, and standards (LORS) (Cal. Code Regs., tit. 20, § 1769). Staff has completed its independent review of all materials received from the project owner.

PROJECT LOCATION AND DESCRIPTION

AEC Phase 1 is a nominal 640-megawatt combined-cycle electric generating station located at 690 North Studebaker Road in the City of Long Beach. The 1,040 MW project was certified by the Energy Commission on April 12, 2017 and began operations on June 25, 2020. The 400 MW Phase 2 SCGT are not under active construction.

DESCRIPTION OF PROPOSED CHANGES

The changes to the design and operation of the project proposed in the petition include the following:

- Increase the CCGT operating hours from 4,460 per unit per year (including starts and stops) to 6,545 hours per year per unit (including starts and stops).
- Decrease the SCGT operating hours from 2,360 per unit per year (including starts and stops) to 1,060 hours per year per unit (including starts and stops).
- Modify air emission limits commensurate with the modification of operating hours.
- An increase in the height of the CCGT exhaust stacks from 140 to 150 feet.
- No changes to the number or type of startups and shutdowns are required or proposed.

NECESSITY FOR THE PROPOSED CHANGES

The primary purpose and need for the proposed changes is to increase the CCGT operating hours and decrease the SCGT operating hours to better reflect the expected demand by the electrical system. Other changes include project design features and revised non-cold startup nitrogen oxide (NOx) emission limit needed to comply with conditions of certification.

STAFF'S ASSESSMENT OF THE PROPOSED CHANGES

CEC technical staff reviewed the proposed changes to the project for potential environmental effects and consistency with applicable LORS. Staff has determined that only the technical areas of Air Quality, Land Use, Public Health, Traffic and Transportation, and Visual Resources are affected by the proposed project changes. A summary of staff's conclusions reached in each technical area are summarized in **Executive Summary Table 1**.

For **Air Quality**, staff has proposed new and revised conditions of certification to ensure compliance with LORS and/or to reduce potential environmental impacts to a less than significant level. The details of the proposed changes to conditions of certification can be found under the **Air Quality** section in this staff analysis.

For the technical areas of **Land Use**, **Public Health**, **Traffic and Transportation**, and **Visual Resources**, staff has concluded that the proposed changes would not result in a significant impact on the environment or cause the project to not comply with applicable LORS. Staff notes the following for these areas:

Land Use

Proposed changes include an increase in the height of the CCGT exhaust stacks from 140 feet to 150 feet. Land use impacts would remain less than significant with continued conformance with the City of Long Beach General Development Standards that apply to the General Industrial zone district. There is no maximum height restriction for exhaust stacks.

Public Health

The proposed AEC operational changes would result in a slight increase in fuel consumption, which would increase toxic air contaminants (TACs). A health risk assessment (HRA) was performed based on the total TAC emissions resulting from the entire fuel consumption (not the incremental change). Based on the results of the HRA, staff does not expect any significant adverse cancer, or short- or long-term non-cancer health effects from the toxic air emissions due to project modification. Therefore, staff concludes that the proposed project modifications would not result in a significant

adverse impact to public health during operations or cause the project to be noncompliant with applicable LORS.

Traffic and Transportation

Proposed changes include an increase in the height of the CCGT exhaust stacks from 140 feet to 150 feet. The Los Alamitos Army Airfield is approximately 2.5 miles from the AEC. The navigable airspace for the airfield begins at 132 feet above ground level (AGL) over the AEC site. For the original 140-foot tall stacks, AES received a Determination of No Hazard to Air Navigation from the Federal Aviation Administration (FAA). AES will need to submit a notification/application to the FAA of the new stack height, as required by Condition of Certification **TRANS-6**, and comply with any requirements determined necessary by the FAA.

Proposed changes may require 2 to 3 additional aqueous ammonia deliveries per year assuming the facility operates at the permitted maximum hours. Aqueous ammonia will be delivered to the facility in U.S. Department of Transportation (DOT)-certified vehicles with design capacities of 7,000 gallons. These high-integrity vehicles are designed to DOT Code MC307/DOT 407 and are suitable for hauling caustic materials such as aqueous ammonia. Condition of Certification **HAZ-5** requires that only tankers that meet or exceed these specifications will be used for aqueous ammonia deliveries. Condition of Certification **TRANS-4** ensures that the project owner contracts with licensed hazardous materials and waste hauler companies that comply with all applicable regulations.

Traffic and transportation impacts are expected to remain less than significant with continued implementation of the conditions of certification set forth in the Decision.

Visual Resources

The increase in the height of the CCGT exhaust stacks by 10 feet, from 140 feet to 150 feet, would not materially alter the appearance of the project. There would be less-than-significant impacts to visual resources.

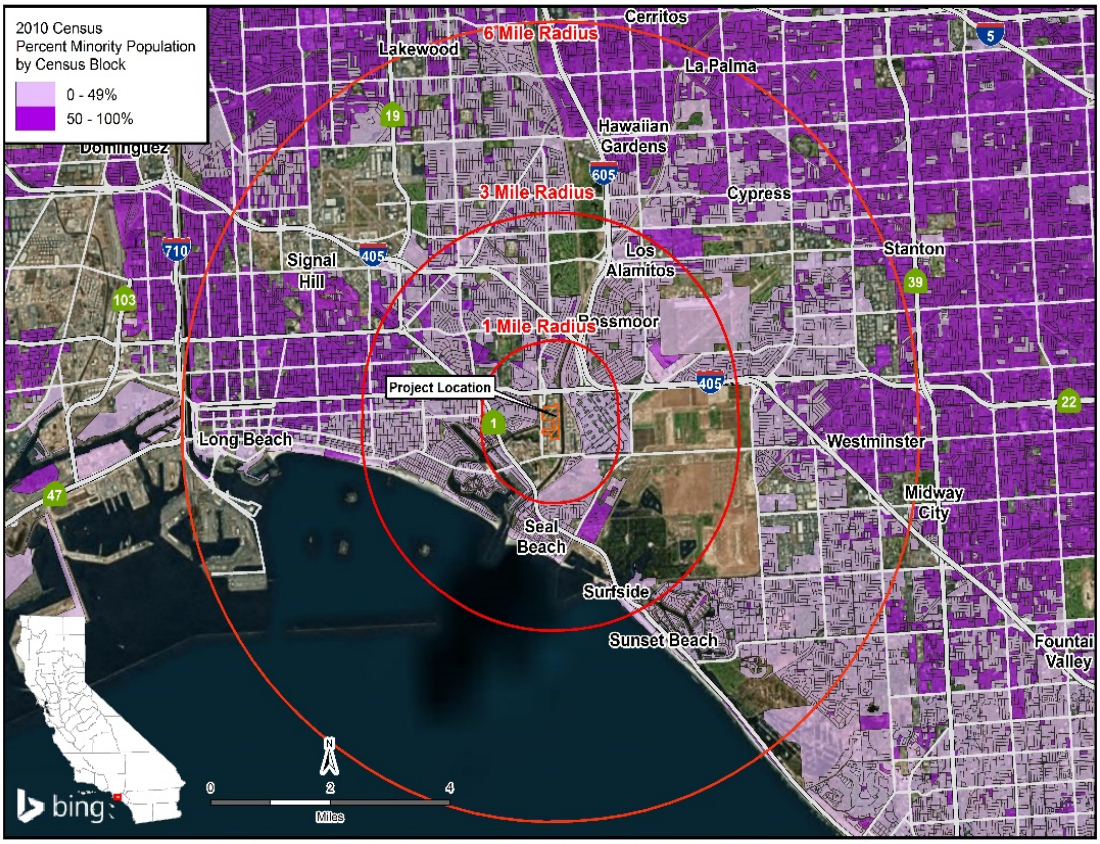
Executive Summary Table 1
Summary of Impacts to Each Technical Area

Technical Areas Reviewed	Technical Area Not Affected	CEQA			Conforms with applicable LORS	Revised or New Conditions of Certification requested or recommended
		Potentially significant impact	Less than significant impact with mitigation	Less than significant impact		
Air Quality			X		X	X
Biological Resources	X					
Cultural Resources	X					
Facility Design	X					
Geological and Paleontological Resources	X					
Hazardous Materials Management	X					
Land Use				X	X	
Noise and Vibration	X					
Paleontological Resources	X					
Public Health				X	X	
Socioeconomics	X					
Soil and Water Resources	X					
Traffic and Transportation				X	X	
Transmission Line Safety and Nuisance	X					
Transmission System Engineering	X					
Visual Resources				X	X	
Waste Management	X					
Worker Safety and Fire Protection	X					

ENVIRONMENTAL JUSTICE

Environmental Justice – Figure 1 shows 2010 census blocks in the six-mile radius of the Alamitos Energy Center with a minority population greater than or equal to 50 percent. The population in these census blocks represents an environmental justice (EJ) population based on race and ethnicity as defined in the United States Environmental Protection Agency's *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*. Staff conservatively obtains demographic data within a six-mile radius around a project site based on the parameters for dispersion modeling used in staff's air quality analysis. Air quality impacts are generally the type of project impacts that extend the furthest from a project site. Beyond a six-mile radius, air emissions have either settled out of the air column or mixed with surrounding air to the extent the potential impacts are less than significant. The area of potential impacts would not extend this far from the project site for most other technical areas included in staff's EJ analysis.

ENVIRONMENTAL JUSTICE - FIGURE 1
Alamitos Energy Center - Census 2010 Minority Population by Census Block



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: Census 2010 PL 94-171 Data

Based on California Department of Education data in the **Environmental Justice – Table 1**, staff concluded that the proportion of those living in the school district of Westminster Elementary School District (within a six-mile radius of the project site) and enrolled in the free or reduced price meal program is larger than those in the reference geographies, and thus are considered an EJ population based on low income as defined in *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*. **Environmental Justice – Figure 2** shows where the boundaries of the school districts are in relation to the six-mile radius around the Alamitos Energy Center site.

Environmental Justice – Table 1
Low Income Data within the Project Area

LOS ANGELES COUNTY SCHOOL DISTRICTS IN SIX-MILE RADIUS	Enrollment Used for Meals	Free or Reduced-Price Meals	
Long Beach Unified School District	74,681	49,956	66.9%
ABC Unified School District	20,550	10,589	51.5%
REFERENCE GEOGRAPHY			
Los Angeles County	1,492,735	1,034,525	69.3%
ORANGE COUNTY SCHOOL DISTRICTS IN SIX-MILE RADIUS	Enrollment Used for Meals	Free or Reduced-Price Meals	
Cypress Elementary School District	3,957	1,405	35.5%
Los Alamitos Unified School District	9,833	1,648	16.8%
Ocean View Elementary School District	8,263	3,857	46.7%
Westminster Elementary School District	**9,264**	**6,625**	**71.5%**
REFERENCE GEOGRAPHY			
Orange County	485,841	239,334	49.3%

CDE 2018. California Department of Education, DataQuest, Free or Reduced-Price Meals, District level data for the year 2017-2018, <http://dq.cde.ca.gov/dataquest/>.

The following technical areas (if affected by a project change) consider impacts to EJ populations: Air Quality, Cultural Resources (indigenous people), Hazardous Materials Management, Land Use, Noise and Vibration, Public Health, Socioeconomics, Soil and Water resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, Waste Management, and Worker Safety and Fire Protection.

ENVIRONMENTAL JUSTICE - FIGURE 2
Alamitos Energy Center - Environmental Justice Population Based on Low Income

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: California Department of Education, DataQuest; TIGER Data; S1701 ACS 5-Year Estimates

ENVIRONMENTAL JUSTICE CONCLUSIONS

For the technical areas that consider EJ populations and affected by the project changes – Air Quality, Land Use, Public Health, Traffic and Transportation, and Visual Resources – staff concludes that impacts would be less than significant, or less than significant with new and revised conditions of certification (Air Quality, only), and thus would be less than significant on the EJ population represented in **Environmental Justice – Figure 1**, **Table 1**, and **Figure 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 will recommend approval of the petition to the CEC:

> (i) there is no possibility that the change may have a significant effect on the environment; and
>
> (ii) the change would not cause the project to fail to comply with any applicable laws, ordinances, regulations, or standards.

ALAMITOS ENERGY CENTER (13-AFC-1C)
Request to Amend Final Commission Decision
AIR QUALITY
Nancy Fletcher

SUMMARY AND CONCLUSIONS

The proposed changes would result in an increase to potential annual facility emissions of nitrogen oxide, carbon monoxide, volatile organic compounds, and oxides of sulfur, and a potential increase in annual natural gas usage. There are no potential annual emission increases for particulate matter less than 10 or 2.5 microns in size. The increases in potential emissions result from the proposed increase in operation of the combined-cycle gas turbines. With the exception of particulate matter, the emission reductions from the proposed decrease in operation of the simple-cycle gas turbines do not fully offset the proposed emission increases from the combined-cycle gas turbines on an annual basis.

There are no proposed changes to the maximum hourly or daily emissions for all facility equipment. The only proposed change to monthly emissions is for nitrogen oxides from the combined-cycle gas turbines. This increase is the result of a proposed higher non-cold startup nitrogen oxide emission limit. The proposed higher non-cold startup nitrogen oxide emission limit is not used in the worst case hourly or daily emission calculations.

AES would be required to hold additional Regional Clean Air Incentives Market Trading Credits to mitigate the monthly increase in NOx emissions. Staff is also recommending updates to the conditions of certification to ensure compliance with all laws, ordinances, regulations, and standards. With the proposed mitigation, there are no air quality environmental justice issues related to the proposed facility modifications and no minority or low-income populations would be significantly or adversely impacted.

BACKGROUND

On April 4, 2019, AES Alamitos Energy, LLC (AES) filed a Petition (AES 2019) with the California Energy Commission (CEC) requesting multiple project modifications (outlined below) to the existing Alamitos Energy Center (AEC) Final Commission Decision.

AEC was certified by the CEC as a multi-phase project on April 12, 2017 (Final Commission Decision). AEC is located in the City of Long Beach adjacent to the existing Alamitos Generating Station (AGS). AEC consists of two natural gas-fired power blocks. Power Block 1 is a combined-cycle gas turbine (CCGT) power block and Power Block 2 is a simple-cycle gas turbine (SCGT) power block. Each power block is served by a separate oil water separator and ammonia storage tank. On January 31, 2020, the CCGT power block (Phase 1) transitioned from commissioning to operation. Construction of the SCGT power block (Phase 2) is not currently active.

Power Block 1 includes two combustion turbine generators (CTGs) with nominal ratings of 227 megawatts (MW) each, and one shared steam turbine generator (STG) with a

nominal rating of 229 MW. Each CTG exhausts to a heat recovery steam generator (HRSG) without supplemental firing capabilities. The CTG/HRSG trains feed into the common STG in a 2-on-1 configuration. Power Block 1 includes an air-cooled condenser, a 70.8 million British thermal units per hour (MMBtu/hr) auxiliary boiler, and related ancillary equipment. Construction of Power Block 1 is complete.

Power Block 2 includes four 100-MW simple-cycle, intercooled CTGs. Each SCGT includes dry low NOx combustors, selective catalytic reduction (SCR) equipment for nitrogen oxide (NOx) reduction, an oxidation catalyst to reduce carbon monoxide (CO) emissions, and ancillary equipment.

On August 3, 2018, staff approved the temporary use of an additional laydown area to support construction. No changes to the conditions of certification were required.

On July 5, 2019, AES submitted a separate petition requesting changes to the auxiliary boiler to complete the auxiliary boiler commissioning. On September 9, 2019, staff docketed a statement of staff approval for an increase in the auxiliary boiler commissioning hours, revision of boiler commissioning emission factors, increase in the minimum ammonia injection rate, addition of a carbon monoxide (CO) continuous emissions monitoring system (CEMS) for the boiler, updated testing requirements, clarification of commissioning boiler and turbine overlap, and other refinements (CEC 2019).

AES 2019 requests the CEC approve the following:

- An increase in the approved annual operating hours of the CCGTs.
- A reduction of the approved annual operating hours of the SCGTs.
- An increase in the CCGTs exhaust stack heights from 140 to 150 feet.

Between May 11, 2018 and February 11, 2020, AES filed multiple applications with the South Coast Air Quality Management District (SCAQMD) to modify the SCAQMD-issued operating permit, including:

- An update to the dimensions and capacity of the ammonia tank.
- An update to the exhaust temperature range of the inlet of the SCR and CO catalyst bed.
- An update to the ammonia injection range of the SCR.
- A revision of the CO emission monitoring requirements.
- A revision of the Alamitos Generating Station Boiler Retirement Plan.
- An increase of the non-cold startup NOx emission limit for the CCGTs.

On April 16, 2020, AES submitted a request to CEC to incorporate the project applications into one analysis (AES 2020).

The AEC is a major source and requires a Title V operating permit. The SCAQMD evaluated the requested changes in two separate documents. On February 25, 2020

and April 7, 2020, the SCAQMD provided evaluations and proposed operating permits incorporating the proposed changes for review. The first evaluation triggered a 45-day United States Environmental Protection Agency (U.S. EPA) regulatory review and a 30-day public noticing period. The SCAQMD considered the second evaluation a minor amendment and requested an expedited U.S. EPA review. After the U.S. EPA review concluded for both evaluations, the SCAQMD combined the evaluations into one final Title V permit on April 22, 2020.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS) COMPLIANCE

SCAQMD reviewed the proposed modifications and determined with changes to the SCAQMD issued permit conditions the proposed changes would comply with their current rules and regulations. A compliance summary is included in **Air Quality Table 1**. The SCAQMD compliance review evaluated AEC as if the project were pre-operational, consistent with the filing timeline.

There have been changes to air quality laws, ordinances, regulations, and standards (LORS) applicable to the project since the Final Commission Decision. **Air Quality Table 1** includes a summary of the air quality LORS applicable to the changes proposed in this amendment. This table is not intended to be comprehensive of all AEC facility LORS. The conditions of certification in the Final Commission Decision and amendments thereafter ensure that the facility would remain in compliance with all applicable LORS.

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

APPLICABLE LAW	DESCRIPTION AND COMPLIANCE
Federal	**U.S. Environmental Protection Agency (U.S. EPA)**
Title 40, Code of Federal Regulations, part 50 (National Primary and Secondary Ambient Air Quality Standards)	Part 50 establishes the National Ambient Air Quality Standards (NAAQS). NAAQS define levels of air quality that are necessary to protect public health. Compliance is expected.
Title 40, Code of Federal Regulations, part 51 (Requirements for Preparation Adoption and Submittal of Implementation Plans)	Requires emission reporting and control strategies for the attainment and maintenance of national standards. Includes provisions for good engineering practices (GEP) for stack height. Compliance is expected.
Title 40, Code of Federal Regulations, part 52 (Approval and Promulgation of Implementation Plans)	Establishes requirements for attainment emissions. Prevention of Deterioration (PSD) requires review and facility permitting for construction of new or modified major stationary sources of pollutants at locations where ambient concentrations attain the NAAQS. SCAQMD has partial delegation of PSD authority from the U.S. EPA depending on the calculation methodology and plantwide applicability limits. AES opted to apply to the SCAQMD. The SCAQMD performed a PSD review. Continued compliance is expected. See the Analysis Section for details.

Title 40, Code of Federal Regulations, part 60, subpart A (General Provisions)	Outlines general requirements for facilities subject to standards of performance including notification, work practice, monitoring, and testing requirements. Staff is proposing modifications to the conditions of certification to ensure compliance.
Title 40, Code of Federal Regulations, subpart KKKK (Standards of Performance for Stationary Combustion Turbines)	Establishes new source performance standards for combustion turbines commencing construction, modification, or reconstruction after February 18, 2005. This subpart is applicable to both the CCGTs and SCGTs. The subpart limits NOx emissions to 15 parts per million (ppm) at 15 percent oxygen (O_2) and fuel sulfur limit of 0.060 pounds (lbs) of oxides of sulfur (SOx) per MMBtu heat input. The proposed changes do not affect the NOx emission concentration requirements. The CCGTs are subject to a 2.0 ppm NOx limit and the SCGTs a 2.5 ppm NOx limit. Compliance with the NOx limits will be monitored with a CEMS. Compliance with the fuel sulfur limit is based on the Southern California Gas Company Tariff Rule No. 30 limiting the fuel total sulfur. Compliance with all other provisions, including recordkeeping, is expected.
Title 40, Code of Federal Regulations, part 60, subpart TTTT (Standards of Performance for Greenhouse Gas Emissions for Electrical Generating Units)	Establishes standards of performance for carbon dioxide (CO_2). Affected baseload electric generating units are subject to a gross energy output standard of 1,000 lbs of CO_2 per megawatt hour (MWh). AES is required to comply with the regulations and the conditions of certification include Subpart TTTT requirements. Staff is proposing updates to the applicable conditions of to ensure compliance.
Title 40, Code of Federal Regulations, part 63, subpart YYYY (National Emission Standards for Hazardous Air Pollutants for Stationary Gas Turbines)	This subpart establishes requirements for facilities that are major sources of hazardous air pollutants (HAPS). The facility is considered an area source of HAPS and not a major source of HAPS since HAP emissions are less than the 25 ton per year facility threshold and 10 ton per year pollutant threshold.
Title 40, Code of Federal Regulations, part 64 (Compliance Assurance Monitoring (CAM))	CAM regulations apply to major stationary sources that use control equipment to achieve emission limits. The CCGTs and SCGTs are located at a major source. The CCGT's NOx, CO, and volatile organic compound (VOC) emissions are subject to Best Available Control Technology (BACT) requirements. Applicable BACT limits are met by using external control equipment consisting of a SCR catalyst and a CO oxidation catalyst. Compliance for CCGT CO and NOx requirements are demonstrated through the CEMS. The CO oxidation catalysts also control VOC emissions at specified temperatures. Compliance with the VOC emission limit is demonstrated through CO compliance and through source testing. The SCGT's NOx, CO, and VOC emissions are subject to BACT requirements. However, the SCGTs pre-controlled VOC is less than the threshold. CAM requirements for the SCGT are only applicable to NOx and CO. Compliance for SCGT CO and NOx requirements are

	demonstrated through the CEMS. Compliance with the monitoring requirements is expected.
Title 40, Code of Federal Regulations, part 68 (Chemical Accident Prevention Provisions)	The AEC facility is exempt from this requirement. AEC is subject to California's Accidental Release Prevention Program for aqueous ammonia storage and use. The existing AGS ammonia tanks are subject to Part 68 requirements.
Title 40, Code of Federal Regulations, part 70 (State Operating Permit Programs)	Part 70 establishes the Title V permitting program. AEC is considered a federal major source and subject to the Title V Operating Permit Program. Title V permits consolidate federally enforceable operating limits. An updated Title V application has been submitted as part of SCAQMD requirements. Continued compliance is expected.
Title 40, Code of Federal Regulations, part 72 -78 (Acid Rain Provisions)	The acid rain program requirements establish controls for sulfur dioxide (SO_2) and NOx emissions from fossil fuel-fired combustion used to generate electricity. Facilities are required to cover SO_2 emissions with allowances or offsets. Compliance with acid rain provisions is implemented through the Title V program. This program is within the jurisdiction of the SCAQMD with U.S. EPA oversight. SO_2 emissions are monitored through fuel meters and gas analysis. If AEC requires additional SO_2 credits they would acquire the necessary SO_2 allowances from the SO_2 trading market. Compliance is expected.
State	**California Air Resources Board and Energy Commission**
Health & Safety Code, sections 40910-40930 (District Plans to Attain State Ambient Air Quality Standards)	State Ambient Air Quality Standards should be achieved and maintained. The permitting of the source needs to be consistent with the approved clean air plan. The SCAQMD New Source Review (NSR) program needs to be consistent with regional air quality management plans. Compliance is expected.
Health & Safety Code, sections 41700-41701 (General Limitations)	Establishes nuisance and visible emission requirements. Prohibits discharge of such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance. Prohibits visible emissions darker than Ringelmann 2 or 40 percent opacity. The SCAQMD issued AES two Notices of Violation (NOVs) during the CCGT commissioning. See additional discussion in Rule 402 discussion.
Health & Safety Code, section 42301.6 (AB 3205)	Establishes noticing requirements for projects within 1,000 feet of a school site. Rosie the Riveter High School used to operate onsite. AES told SCAQMD the school vacated in late spring 2019 and the building has been repurposed for AES use. Therefore, AEC is no longer located within 1,000 feet of a school site and these public noticing requirements no longer apply.
Title 17, California, Code, of Regulations, subchapter 10 (Climate Change)	Established requirements for mandatory greenhouse gas reporting, verification and other requirements pursuant to cap and trade regulations. Compliance is expected.

Title 20, California Code of Regulations, sections 2900-2913 (Provisions Applicable to Power Plants 10 MW and Larger)	Establishes the greenhouse gases emission performance standard (EPS), applicable to 10 MW and larger power plants (SB1368). Compliance is expected. See additional discussion in the Greenhouse Gas Analysis Section.
Local	**South Coast Air Quality Management District**
Regulation II – Permits Rules 201-204 (Permit to Construct, Temporary Permit to Operate, Permit to Operate, Permit Conditions)	Written authorizations shall be obtained prior to the use or replacement of any equipment which may eliminate, reduce or control air contaminants. The permit to construct serves as a temporary permit to operate prior to the issuance of the final operating permit. Establishes the ability for the SCAQMD to impose conditions on any permit as needed to assure compliance with all applicable regulations. Compliance is expected.
Regulation II – Permits Rule 205 (Expiration of Permit to Construct.)	A permit to construct shall expire one year from the date of issuance unless an extension is granted. AEC is a multi-phase project with project timelines included in the conditions of certification. The SCGT power block start-of-construction date has been moved to June 30, 2022. Staff is proposing changes to the conditions of certification to ensure compliance. See the Analysis Section for further discussion.
Regulation II – Permits Rule 212 (Standards for Approving Permits and Issuing Public Notice)	Outlines specific criteria for approving permits and issuing public notice. Outlines requirements for Regional Clean Air Incentives Market (RECLAIM) facilities. The proposed changes do not trigger Rule 212 public noticing requirements because AEC is no longer located within 1,000 feet of a school site, and the annual emission increases would not exceed noticing thresholds. Public noticing is not required under Rule 212 but is required because the project is considered a Title V significant modification.
Regulation II – Permits Rule 218 (Continuous Emission Monitoring (CEM))	Establishes requirements for CEMS. This rule does not apply to continuous monitoring systems that monitor the performance of control equipment and not compliance with any applicable limit or standard. Only the CO CEMS will be subject to Rule 218 requirements; the NOx CEMS are subject to RECLAIM requirements (including missing data and available data requirements). AES submitted applications to the SCAQMD for the NOx and CO CEMS on August 22, 2018. SCAQMD granted initial approval for the CEMS on February 20, 2019. Continued compliance is expected.
Regulation IV – Prohibitions Rule 401 (Visible Emissions)	Establishes limits on visible emissions from stationary sources. Visible emissions are not expected from AES during operation. Per SCAQMD, AES received approximately 45 public complaints (~44 from October 5, 2019 to November 7, 2019) during the first fire of the CCGT during commissioning. The complaints were for visible emissions, noise, and chemical odor. The SCAQMD issued two NOVs. The SCAQMD Hearing Board

	issued AEC a limited variance to continue commissioning. AES settled the two NOVs with the SCAQMD. SCAQMD reports the facility is currently operating in compliance with the opacity requirements.
Regulation IV – Prohibitions Rule 402 (Nuisance)	Prohibits the discharge of air contaminants or other material which could cause injury, detriment, nuisance or annoyance to the public or could damage business or property. AES will use ammonia (NH_3) for emission control. When in operation, the facility will maintain a 5.0 parts ppm ammonia slip level. Nuisance problems are not expected from AES under normal operations. As discussed above, AES received approximately 45 public complaints during the first fire of the CCGT during commissioning. The complaints included nuisance. The SCAQMD issued two NOVs. The SCAQMD Hearing Board issued AEC a limited variance to continue commissioning. AES settled the two NOVs with the SCAQMD. Staff is not aware of any nuisance complaints since November 2019.
Regulation IV – Prohibitions Rule 403 (Fugitive Dust)	Requires the prevention, reduction, or mitigation of fugitive dust emissions from project sites. Staff conditions require dust control during construction. Continued compliance is expected during construction and ongoing operations.
Regulation IV – Prohibitions Rule 407 (Liquid and Gaseous Contaminants)	Limits emissions of CO and sulfur compounds calculated as SO_2 from stationary sources. The established emission limits for the turbines are more stringent than the limits in this rule. CO emissions will be monitored by a CEMS and the use of natural gas complies with the sulfur limit in Rule 431.1 (see below). Compliance is expected.
Regulation IV – Prohibitions Rule 409 (Combustion Contaminants)	Limits total particulate emissions on a grain per standard cubic feet basis. The AEC turbines combust pipeline quality natural gas. The proposed changes would not impact Rule 409 compliance because there are no changes proposed to the maximum hourly emission rates. Compliance is expected.
Regulation IV – Prohibitions Rule 431.1 (Sulfur Content of Gaseous Fuels)	Limits sulfur content in gaseous fuels to 16 ppm (calculated as hydrogen sulfide) to reduce SOx emissions. Commercial grade natural gas has an average sulfur content of 4 ppm. AEC would only combust commercial grade natural gas. Compliance is expected.
Regulation IV – Prohibitions Rule 474 (Fuel Burning Equipment –Oxides of Nitrogen)	Establishes limits for NOx emissions from stationary sources. This rule is superseded by NOx RECLAIM pursuant to Rule 2001, Table 1. Rule 2001 clarifies that Rule 474 is not applicable to RECLAIM facilities because Rule 474 was last amended prior to October 5, 2018.
Regulation IV – Prohibitions Rule 475 (Electric Power Generating Equipment)	Limits combustion contaminant emissions (of PM10) from any equipment with a maximum rating of more than 10 MW used to produce electric power. Combustion contaminants are limited to 11

	pounds per hour and 0.01 grains per dry standard cubic feet (gr/dscf) calculated at 3 percent O_2 over 15 consecutive minutes. The proposed changes would not impact the CCGTs and SCGTs compliance with Rule 475 requirements because there are no changes proposed to the maximum hourly PM10 emission rates. Compliance is expected.
Regulation XI – Source Specific Standards Rule 1134 (Emissions of Oxides of Nitrogen from Stationary Gas Turbines)	Establishes NOx limits and monitoring and testing requirements for applicable gas turbines. Rule 1134 was amended on April 5, 2019. RECLAIM requirements no longer supersede Rule 1134 requirements. Rule 1134 requirements would not be applicable to AEC because Rule 1134 does not apply to stationary gas turbines subject to Rule 1135. AEC is subject to Rule 1135 as described next.
Regulation XI – Source Specific Standards Rule 1135 (Emissions of Oxides of Nitrogen from Electric Power Generating Systems)	Establishes NOx and ammonia emission limits, startup, shutdown, tuning, monitoring, recordkeeping, reporting, and testing requirements. Rule 1135 was amended on November 2, 2018. RECLAIM requirements no longer supersede Rule 1135 requirements. The CCGTs and SCGTs are subject to Rule 1135. The CCGTs and SCGTs BACT requirements meet the emission limitations for NOx and NH_3. The existing CCGTs and SCGTs license requirements meet the provisions for startup and shutdown operations. AES clarified to the SCAQMD that the turbines are not expected to require tuning after commissioning. AEC's RECLAIM monitoring, recordkeeping, and reporting requirements meet Rule 1135 requirements. Staff is proposing to amend the ammonia testing requirements in **AQ-D12** to incorporate the more stringent Rule 1135 ammonia testing requirement. Compliance is expected.
Regulation XIII New Source Review (New Source Review for Criteria Pollutants)	Applies to new or modified sources that may emit any nonattainment air contaminant, ozone depleting compound, or NH_3. Precursors are treated as nonattainment pollutants. This regulation establishes BACT/Lowest Achievable Emission Rate (LAER), modeling, and offset requirements. NOx emissions are regulated under Regulation XX (RECLAIM). Compliance is expected. Further discussion is included in the analysis.
Regulation XIII New Source Review Federal PM2.5 New Source Review Program)	Outlines requirements for PM2.5 for any new major polluting facility or major modification to a major polluting facility located in areas designated as nonattainment for PM2.5. Establishes the use of LAER, offsets, certification of compliance with emission limits and alternative analysis for applicable projects. Compliance is expected. See discussion in analysis.
Regulation XIV: Toxics and Other Non-Criteria Pollutants Rules 1401/1401.1	New Source review of Toxic Air Contaminants, Requirements for New and Relocated Facilities Near Schools. Specifies limits for maximum individual cancer risk and acute and chronic

	hazard index for modifications to existing facilities emitting toxic air contaminants. Best Available Control Technology for Toxics (T-BACT) is required for projects with potential exposures over an established threshold. Additional health protection is established for children at schools located within 500 feet of facilities. Compliance is expected.
Regulation XVII: Prevention of Significant Deterioration (PSD) Rules 1701, 1702, 1703, 1706, 1714	Rules include: Applicability, Top Down BACT, Certificate of Compliance, Copy of Application, Analysis, Prevention of Significant Deterioration for Greenhouse Gases. Establishes requirements for preconstruction review to ensure that the air quality in attainment does not significantly deteriorate and maintains a margin for future growth. Requirements for PSD review include use of BACT, modeling, and impact analysis. SCAQMD has partial delegation of PSD authority from the U.S. EPA depending on the calculation methodology and plantwide applicability limits. Establishes requirements for the review of greenhouse gas emissions (GHGs). Review includes a BACT analysis; however, modeling and monitoring are not required for GHGs. Compliance is expected. Further discussion is included in the analysis.
Regulation XX: Regional Clean Air Incentives Market (RECLAIM)	A series of rules establishing requirements for RECLAIM facilities. RECLAIM is designed to allow facilities flexibility in achieving emission reduction requirements for NOx and SOx through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures or the purchase of excess emission reductions. Rule 2005 – New Source review for RECLAIM. Establishes review requirements for new or modified facilities subject to the RECLAIM program. BACT is required for increases of any nonattainment air contaminant, ozone-depleting compound or ammonia. Major source applicants must also verify that all applicant-owned major stationary sources in the state are in compliance with all federal emission limitations and standards. Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SOx) Emissions. Outlines the specific monitoring and reporting requirements for SOx. Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions. Outlines the specific monitoring and reporting requirements for NOx. Approval of the recommended changes would ensure compliance. Further discussion is included in the analysis.
Regulation XXX: Title V Permits	A series of rules establishing general requirements and application procedures for facilities subject to Title V requirements. The SCAQMD processed this amendment as two separate evaluations. SCAQMD determined that the change in operational hours

	amendment is considered a significant permit revision and required a 45-day U.S. EPA review period. In addition, this amendment triggered a 30-day public review period. The second evaluation was processed as a minor amendment. Continued compliance is expected.
Regulation XXXI Acid Rain Permits	Title IV of the federal Clean Air Act provides for the issuance of acid rain permits for qualifying facilities. Regulation XXXI integrates the Title V program with the RECLAIM program. Regulation XXXI requires a subject facility to obtain emission allowances for SOx emissions as well as monitoring SOx, NOx, and CO_2 emissions from the facility. Compliance is expected.

SETTING

SITE DESCRIPTION

The project site is in the city of Long Beach in Los Angeles County located in the South Coast Air Basin (SCAB). The AEC is located on approximately 21 acres of a 71-acre parcel within the existing AGS site located at 690 N. Studebaker Road. The 71-acre site is bordered by the SCE switchyard and State Route 22 to the north, the San Gabriel River and Los Angeles Department of Water and Power Haynes Generating Station to the east, the former Plains West Coast Terminals petroleum storage facility and some undeveloped property to the south, and the Los Cerritos channel, AGS cooling water canals, and residences to the west. The Rosie the Riveter Charter High School is no longer located on the northwest corner of the AGS parcel.

Climate and Meteorology

The climate of the SCAB is strongly influenced by local terrain and geography. The SCAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean on the west and south, and the San Gabriel, San Bernardino and San Jacinto Mountains to the north and east. The climate is mild, tempered by cool sea breezes and is dominated by the semi-permanent high pressure of the eastern Pacific. The mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds.

Ambient Air Quality Standards

The U.S. EPA and the California Air Resources Board (ARB) have both established allowable maximum ambient concentrations of criteria air pollutants. Ambient air quality standards are designed to protect people who are most susceptible to respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. The ambient air quality standards are also set to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Current state and federal ambient air quality standards are listed in **Air Quality Table 2**. The averaging time for the various ambient air quality standards (the duration of

time the measurements are taken and averaged) ranges from one hour to one year. The standards are read as a concentration, in parts per million (ppm), parts per billion (ppb), or as a weighted mass of material per unit volume of air, in milligrams (mg) or micrograms (µg) of pollutant in a cubic meter (m^3) of ambient air, drawn over the applicable averaging period.

Air Quality Table 2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.070 ppm (137 µg/m^3) [a]	0.070 ppm (137 µg/m^3)
	1 Hour	—	0.09 ppm (180 µg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/$m^{3)}$
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual	53 ppb (100 µg/m^3)	30 ppb (57 µg/m^3)
	1 Hour	100 ppb (188 µg/m^3) [b]	180 ppb (339 µg/m^3)
Sulfur Dioxide (SO_2)	24 Hour	—	0.04 ppm (105 µg/m^3)
	3 Hour	0.5 ppm (1300 µg/m^3)	—
	1 Hour	75 ppb (196 µg/m^3) [c]	0.25 ppm (655 µg/m^3)
Respirable Particulate Matter (PM10)	Annual	—	20 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM2.5)	Annual	12 µg/m^3	12 µg/m^3
	24 Hour	35 µg/m^3 b	—
Sulfates (SO_4)	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Rolling 3-Month Average	0.15 µg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8 Hour	—	Extinction coefficient of 0.23 per kilometer (statewide)

Source: ARB 2019a, U.S. EPA 2019b
Notes:[a] Fourth- highest maximum 8 – hour concentration, averaged over 3 years.
[b] 98th percentile of daily maximum value, averaged over 3 years.
[c] 99th percentile of daily maximum value, averaged over 3 years.

Ambient Air Quality Attainment Status

Air Quality Table 3 summarizes the area's attainment status for current state and federal ambient air quality standards (AAQS) for the SCAB.

Air Quality Table 3
SCAQMD Attainment Status

Pollutants	Attainment Status Federal Classification	Attainment Status State Classification
Ozone (1-hr)	**Nonattainment**	**Nonattainment**
Ozone (8-hr)	**Nonattainment**	**Nonattainment**
CO	Attainment (Maintenance)	Attainment
NO_2 (1-hr)	Unclassified/Attainment	Attainment
NO_2 (Annual)	Attainment (Maintenance)	Attainment
SO_2	Attainment	Attainment

PM10	Attainment	**Nonattainment**
PM2.5	**Nonattainment**	**Nonattainment**
Sulfates	No Federal Standard	Attainment
Lead	**Nonattainment (Partial)[b]**	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Visibility Reducing Particulates	No Federal Standard	Unclassified

Source: ARB 2019a, U.S. EPA 2019a and b

Notes: [a] The federal 1-hour standard was revoked in June 2005; however, the South Coast Air Basin has not attained this standard and is subject to anti-backsliding requirements.

[b] The Los Angeles County portion of the basin.

The SCAQMD is classified as nonattainment for the 24-hr and annual California Air Quality Standards (CAAQS) for particulate matter less than ten microns (PM10), the 24-hr and annual NAAQS and annual CAAQS standards for particulate matter less than 2.5 microns (PM2.5), and both CAAQS and NAAQS for ozone. The SCAQMD is classified as partial nonattainment for lead for the Los Angeles County portion due to monitors near facilities with lead emissions. NOx, sulfur oxides (SOx), and volatile organic compounds (VOC) are precursors to non-attainment pollutants. NOx and VOC are precursors to ozone, and NOx and SOx are precursors to PM10 and PM2.5. SCAQMD considers precursor pollutants as nonattainment for the purposes of SCAQMD Regulation XIII New Source Review. See PM2.5 Federal New Source Review analysis for ammonia (NH_3) discussion.

ANALYSIS

OPERATION SUMMARY AND EMISSIONS ANALYSIS

This analysis includes a consolidated review of the changes proposed in AES 2019 and AES 2020. With the exception of the non-cold startup NOx emission limit for the CCGTs, staff notes that AES informed CEC staff of the additional proposed permit amendments and requested the changes to be consolidated in a single SCAQMD evaluation. The need to increase the non-cold startup NOx emission limit was discovered at a later date during commissioning and was processed by the SCAQMD as a separate evaluation. Additional discussion is included below.

The first fire of CCGT-1 occurred on October 3, 2019 and the first fire of CCGT-2 occurred on October 11, 2019. On January 31, 2020, AES provided notice to the CEC that AEC had completed commissioning and was moving to the operational phase. AEC officially began commercial operation in the beginning of February 2020.

The existing AGS includes six utility boilers (Units 1-6) installed between 1956 and 1969. The CEC AEC license allows Units 1-6 to remain in operation throughout different phases of AEC construction and operation based on each unit's retirement schedule. The retirement of AGS Units 1, 2, 3, and 6 mitigate emissions from the CCGTs and SCGTs. The retirement of Units 4 and 5 are not a requirement in the AEC license. As of December 31, 2019, AES shut down AGS Units 1, 2, and 6. AES submitted a notarized letter verifying the boilers were shut down according to the approved boiler retirement plan. Staff is proposing to modify **AQ-F3** to update the acid rain requirements for retired units.

The CEC license requires AES to cease operation of Unit 3 within 90 days of the of the first fire of SCGT-1, SCGT-2, SCGT-3, or SCGT-4, or by December 31, 2020. At the time of licensing, December 31, 2020 was the deadline established by the California State Water Resources Control Board's (State Water Board's) Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Policy) to bring the AGS facility into compliance with their once-through cooling (OTC) requirements.

The State Water Board has drafted an amendment to the OTC Policy to extend the deadline for AGS Boiler Utility Units 3, 4, and 5 until December 31, 2023. On May 10, 2019, AES submitted a letter to the SCAQMD to update the expected timeline for the construction of Power Block 2 and the retirement of AGS Unit 3. The start of operation for Power Block 2 is currently scheduled for the 4th quarter of 2023. Any extension of the OTC compliance date for Unit 3 could not extend beyond 90 days after the of operation of any unit of Power Block 2. Staff is proposing to modify **AQ-F5** to update the requirements based on this updated timeline.

On May 14, 2018, AES notified CEC staff regarding changes to the CCGT stack heights and size of the ammonia storage tank. On May 11, 2018, applications were submitted to the SCAQMD to incorporate these changes into the SCAQMD-issued permits. AES submitted additional applications for changes to the auxiliary boiler. The auxiliary boiler changes were needed prior to the commissioning of the auxiliary boiler. The proposed auxiliary boiler changes were analyzed and approved by CEC staff (CEC 2019).

AES increased the stack heights for the CCGTs from 140 feet to the as-built height of 150 feet. During licensing, AES identified a stack height of 140 feet above grade as the lowest stack height that allowed the project to comply with the AAQS. During post certification detailed design, AES determined a higher stack height would be required to accommodate the stack dampers to satisfy the noise limits in **Noise-4**.

Federal regulation prevents the use of tall stacks or other dispersion techniques to impact emission limitations required to meet the NAAQS or Prevention of Significant Deterioration (PSD) increments. The regulation does not restrict the actual physical height of a stack or dispersion techniques, it just limits how much credit can be given to these parameters for emission control. The modeling software used to assess impacts in the Final Staff Assessment (FSA) and this evaluation, includes algorithms to ensure GEP stack height regulations are followed. The impact analysis included below for the proposed increase in CCGT annual operating hours and non-cold startup NOx emissions used the increased CCGT stack height in the modeling. There are no air quality concerns regarding the increase in stack height for the CCGTs. Staff recommends changing the stack height from 140 feet to 150 feet in the equipment description for CCGT-1 and CCGT-2.

AES is proposing to decrease the capacity of the ammonia tank from 40,000 gallons to 22,290 gallons. AES indicated there would be no changes to the ammonia concentration, number of deliveries, filling operations, monitoring parameters, or operating schedule. Filling losses are controlled by a vapor recovery line and a pressure valve would control breathing losses. Staff does not expect the decreased capacity of

the tank to change ammonia emissions. Therefore, staff recommends updating the ammonia tank storage capacity in the equipment description.

On November 9, 2018, AES submitted additional applications to the SCAQMD to update the SCR/CO catalyst requirements for the CCGTs. These changes include updating the ammonia injection range and the catalyst exhaust temperature range included in **AQ-D1** and **AQ-D2,** respectively.

The catalyst vendor stated that the catalyst was designed for an operating range of 636 degrees to 738 degrees Fahrenheit (°F) and corresponding flow conditions. The vendor confirmed the SCR catalyst is capable of NOx reduction when operating between 450 to 800°F. SCAQMD proposed to incorporate the wider temperature range into the SCAQMD-issued permits. The equipment is equipped with NOx and CO CEMS to monitor emissions. Staff recommends modifying the language in **AQ-D2** from 570 to 692°F to 450 to 800°F to incorporate the wider effective temperature range.

AES reported that at minimum turn down for the CCGTs, the ammonia injection rate is approximately half of what was initially requested. The dry low-NOx burners can maintain a steady 9 ppm NOx (pre-SCR controlled) emission rate down to the minimum turn-down load of the combustion turbine. This is accomplished by reducing the number of combustion canisters firing at lower turn-down loads. AES originally assumed the NOx emission rate from the combustor would increase at lower loads and would require a higher ammonia injection rate to maintain the 2.0 ppm NOx requirement at the stack exit. AES is concerned that maintaining the current ammonia injection range could exceed the ammonia slip requirement of 5.0 ppm at the lower turn-down loads. Staff recommends lowering the minimum ammonia injection rate in **AQ-D1** from 44 pounds per hour to 20 pounds per hour.

AES is proposing to increase the annual operating hours for the CCGTs and decrease the annual operating hours for the SCGTs. The changes in operating hours between the CCGTs and SCGTS net a zero change in PM10/2.5 emissions; other pollutant emissions would increase. The difference in equipment design and operation results in different emission rates and operating profiles for CCGTs versus SCGTs. AES selected the specific hourly changes to avoid any net change in PM2.5 emissions due to offset considerations. The proposed change would not result in facility PM2.5 emissions above 70 tons per year. See additional discussion below and in the PM2.5 New Source Review Section.

During the commissioning period, equipment performance and emission testing is performed. AES reported the CCGT emission testing indicated the facility could not comply with the non-cold startup NOx emission limit included in **AQ-C1**. The NOx mass emission limit of 17 pounds for a non-cold startup assumed a constant ramp-up rate in gas turbine load and fuel flow up until the emission control equipment could effectively control emissions at normal or steady-state levels. During testing, it was discovered the gas turbine may need to halt the ramp-up while waiting for the electric generator to synchronize to the electrical grid. The length of time this synchronization takes can vary between 10 seconds to 5 or 6 minutes. The longer the process takes, the more emissions are associated with the startup.

On February 5, 2020, AES filed a variance with the SCAQMD seeking relief from the 17-pound NOx non-cold startup limit. The hearing was originally scheduled for March 18, 2020 but was postponed to April 28, 2020 due to COVID-19 related restrictions on public meetings at the Hearing Board. On February 11, 2020, AES filed an application with the SCAQMD to increase the non-cold startup NOx emission limit from 17 pounds per event to 32 pounds per event. The evaluation was completed April 7, 2020 and sent to the U.S. EPA for an expedited review. On April 22, 2020, the SCAQMD issued a combined Title V permit for the changes in operation and the increase to the non-cold startup NOx emission limit.

On April 16, 2020 AES filed a request to CEC to include the non-cold startup NOx emission limit change in AES 2019, for consistency with SCAQMD peremits. The evaluation of the non-cold startup NOx emission limit is included in this analysis.

Staff is proposing the addition of in **AQ-F7** to provide breakdown coverage for non-Rule 218-certified CEMS. SCAQMD Rule 218 includes provisions for breakdown coverage for up to 96 hours for Rule 218-certified CEMS. The breakdown coverage in **AQ-F7** would apply to all non-Rule 218 monitoring systems that are required to be in continuous operation by a condition or other regulatory requirement. This coverage is extended to all continuous monitoring equipment including equipment outlined in **AQ-D1** through **AQ-D9**. This condition was included by the SCAQMD as part of the Title V renewal process.

Operations

The CCGTs and SCGTs operating modes are commissioning, startup, shutdown, and normal or 'steady-state'. Emissions from the different operational modes are quantified separately based on manufacturer data and engineering estimates. Emissions of NOx, CO, and VOC during commissioning, startup, and shutdown periods are typically higher than during normal or steady-state operations.

The AEC operating profile includes two types of turbine startup events for the CCGTs: cold and non-cold. Condition of certification **AQ-C1** includes descriptions of the different startup events. The startup events length is based on the time it takes to reach steady-state or BACT emissions. The startup classifications in the current CEC license are currently described as follows:

- Cold Startup Event: A cold startup occurs after the combustion turbine has been shut down for 48 hours or more. A cold startup shall not exceed 60 minutes. The NOx emissions from a cold startup shall not exceed 61 pounds (lbs). The CO emissions from a cold startup shall not exceed 325 lbs. The VOC emissions from a cold startup shall not exceed 36 lbs.
- Non-Cold Startup Event: A non-cold startup is defined as a startup which occurs after the combustion turbine has been shut down for less than 48 hours. A non-cold startup shall not exceed 30 minutes. The NOx emissions from a non-cold startup shall not exceed 17 lbs. The CO emissions from a non-cold startup shall not exceed 137 lbs. The VOC emissions from a non-cold startup shall not exceed 25 lbs.

AES is proposing to increase the non-cold startup CCGT NOx emission rate from 17 pounds per event to 32 pounds per event. AES is also proposing changes to the CCGT and SCGT annual operating profiles. These changes do not impact the maximum expected CCGT or SCGT commissioning emissions, any other startup and shutdown emission rate, or operating scenarios used to estimate the emissions during normal or steady-state operations.

During licensing, AES provided fourteen operating scenarios for the CCGTs and SCGTs corresponding to a full range of operating loads and ambient temperatures to determine emissions during normal operations. These operating scenarios are used to calculate emissions, evaluate impacts, and determine compliance with LORS and regulatory fees. The proposed changes do not impact the scenario selection. For both the original analysis and current analysis for the CCGTs and SCGTs, the following operating scenarios are used:

- Case 1: Based on 100 percent load, 28°F ambient temperature, without inlet cooling. This case yields the highest controlled emissions. Case 1 emission rates for NOx, CO, VOC, PM10/PM2.5, and short-term SO_2 (0.75 gr/100 scf) were used to calculate the maximum hourly, daily, and monthly emissions for normal operations.
- Case 4: Based on 100 percent load, 65.3°F ambient temperature, with inlet cooling. This case yields the highest controlled emissions for the average annual temperature. Case 4 emission rates for NOx, CO, VOC, PM10/PM2.5, and long-term SO_2 (0.25 gr/100 scf) were used to calculate maximum annual emissions for normal operations. Case 4 is used for annual calculations because the parameters are based on a temperature considered more representative of the annual conditions expected at the AEC site.
- Case 7: Based on 44 percent load, 65.3°F ambient temperature, without inlet cooling. This case was selected as the representative case for the normal operating hours in the annual modeling scenario the CCGTs and SCGTs.
- Case 12: Based on 100 percent load, 59°F ambient temperature, without inlet cooling. This case yields the maximum gross output for each turbine. The maximum gross output is used to for the equipment description. In addition, the SCAQMD uses the maximum rating for their offset and modeling exemption and fee determination.

Combined-Cycle

Normal or steady-state describe the CCGTs when the CTGs, HRSGs, SCR/CO catalysts and STG are functioning as designed. During steady-state operations the emissions are controlled to BACT levels. NOx is controlled to 2.0 ppm CO to 1.5 ppm, and VOC to 2.0 ppm, all at 15 percent oxygen. The maximum hourly emission rates for steady-state operations for the CCGTs (not including startup or shutdown emissions) are based on Case 1 conditions. Annual emissions for steady-state operations are based on Case 4. Case 1 and Case 4 emission hourly rates conditions are included in **Air Quality Table 4.** The emission rates in **Air Quality Table 4** are the same emission rates used to calculate emissions in the FSA.

Air Quality Table 4
Combined-Cycle Hourly Steady-State Emission Rates (Per Unit)

Combined-Cycle	NOx	CO	VOC	SOx	PM10/2.5	NH_3
Controlled (ppm)	2.0 (1-hr)	1.5 (1-hr)	2.0 (1-hr)	N/A	N/A	5.0
Case 1 (lb/hr)	16.5	7.53	5.75	4.86	8.5	15.3
Case 4 (lb/hr)	16.3	7.44	5.68	1.6	8.5	15.3

Source: CEC 2016, CEC 2016a (Table 21), SCAQMD 2020, Staff Analysis

During CTG startup and shutdown operating modes, higher emission rates (relative to steady state operating mode) are expected for VOC, CO, and NOx because the emission control systems are not fully functional or within the operating temperature range. The emission rates for startup and shutdown events for the CCGTs, including the proposed non-cold startup NOx emission limit, are summarized in **Air Quality Table 5**. The emission rates in **Air Quality Table 5,** with the exception of the proposed non-cold startup NOx emission limit, are the same emission rates used to calculate emissions in the FSA.

Air Quality Table 5
Combine-Cycle Startup and Shutdown Emission Rates (Per Unit)

Combined-Cycle	Event Duration	NOx	CO	VOC	SOx	PM10/2.5
Cold Startup (lbs/event)	60 (min)	61.0	325	36.0	< 4.86	< 8.5
Cold Startup (lbs/hour)		61.0	325	36.0	< 4.86	< 8.5
Non-Cold Startup (lbs/event)	30 (min)	32.0	137	25.0	----	----
Non-Cold Startup (lbs/hour)		40.2	142	27.9	< 4.86	< 8.5
Shutdown (lbs/event)	30 (min)	10.0	133	32.0	----	----
Shutdown (lbs/hour)		18.2	138	34.9	< 4.86	< 8.5

Source: CEC 2016 (Table 20), SCAQMD 2020a, Staff Analysis Note: The non-cold startup pound per hour limit is estimated by adding the half hour non-cold startup event with a half hour of normal operation.

The expected maximum daily, monthly, and annual emissions for the CCGTs are determined by factoring in potential startup and shutdown events with steady-state operation. The license currently limits annual emissions and the number and duration of annual startup and shutdown events and annual emission limits but does not include a limit on the number of normal or steady-state operating hours.

AES is proposing changes to the CCGT annual operating profile used to determine annual emissions and increase the total CCGTs annual operating hours from 4,460 to 6,545 per unit. The change in hours only includes an increase to the annual normal operating hours (from 4,100 to 6,005 hours per unit) and does not include any change to the maximum annual operational hours in startup and shutdown modes. The proposed operating profile for the CCGTs per unit is included in **Air Quality Table 6**. There are no proposed changes to the maximum daily or monthly operating profiles.

Air Quality Table 6
Combined-Cycle Operating Profile (Per Unit)

Operating Parameters	Events	Hours
Daily		
Cold Startup	2	2
Non-Cold Startup	0	0
Shutdown	2	1
Steady-State	--	21
Total Daily	--	24
Monthly		
Cold Startup	15	15
Non-Cold Startup	47	23.5
Shutdown	62	31
Steady-State	--	674.5
Total Monthly	--	744
Annual		
Cold Startup	80	80
Non-Cold Startup	420	210
Shutdown	500	250
Steady-State		6,005
Total Annually		6,545

Source: CEC 2016 (Table 22), SCAQMD 2020, Staff Analysis

Air Quality Table 7 includes the estimated maximum daily, monthly, and annual emissions (including startup and shutdown operations) for the CCGTs after the commissioning period. The emissions are calculated based on the equipment emission rates and operating profiles for each emission unit. The proposed increase in the CCGTS annual hours of operation results in an increase to the potential annual emissions of NOx, CO, VOC, SOx, and PM10/2.5. The proposed change to the non-cold startup NOx emission limit results in an increase to maximum monthly and annual NOx emission calculations. There are no proposed changes to any calculated maximum daily or monthly emissions of CO, VOC, SOx, or PM10/2.5 emissions.

Air Quality Table 7
Proposed Combined-Cycle Maximum Daily, Monthly, and Annual Emissions (Per Unit)

Combined-Cycle	NOx	CO	VOC	SOx	PM10/2.5
Daily (lb/day)	488.50	1,074.13	256.75	116.64	204.00
(FSA, lb/day)	(488.50)	(1,074.13)	(256.75)	(116.64)	(204.00)
Monthly (lb/month)	14,168.25	24,638.99	7,577.38	3,615.84	6,324.00
(FSA, lb/month)	(13,463.25)	(24,638.99)	(7,577.38)	(3,615.84)	(6,324,00)
Annual (lb/year	121,202	194,717	63,448	10,483	55,632.5
(FSA, lb/year)	(83,850)	(180,544)	(52,668)	(7,435)	(39,440)
Annual (tons/year)	60.6	97.36	31.74	5.24	27.82
(FSA, tons/year)	(41.93)	(90.27)	(26.33)	(3.72)	(19.72)

Source: CEC 2016, CEC 2016a (FSA Table 31), SCAQMD 2020, SCAQMD 2020a, Staff Analysis

Simple-Cycle

Normal or steady state describe the SCGTs when the SCR/CO catalysts are functioning. NOx is controlled to 2.5 ppm, CO to 2.0 ppm, and VOC to 2.0 ppm, all at 15 percent oxygen. The maximum hourly emission rates for steady-state operations for the SCGTs (not including startup or shutdown emissions) are based on Case 1 conditions. Annual emissions for steady-state operations are based on Case 4. Case 1 and Case 4 emission hourly rates conditions are included in **Air Quality Table 8.** The emission rates in **Air Quality Table 8** are the same emission rates used to calculate emissions in the FSA.

Air Quality Table 8
Simple-Cycle Hourly Steady-State Emission Rates (Per Unit)

Simple-Cycle	NOx	CO	VOC	SOx	PM10/2.5	NH_3
Controlled (ppm)	2.5 (1-hr)	4 (1-hr)	2 (1-hr)	N/A	N/A	5.0
Case 1 (lb/hr)	8.23	4.01	2.30	1.62	6.23	6.09
Case 4 (lb/hr)	8.20	3.99	2.29	0.54	6.23	6.07

Source: CEC 2016, CEC 2016a (Table 24), SCAQMD 2020, Staff Analysis

The SCGTs have one startup scenario and a simpler shutdown sequence. The SCGTs are designed to quickly achieve steady-state operations. The emission rates for startup and shutdown events for the simple-cycle turbines are summarized in **Air Quality Table 9**. The emission rates in **Air Quality Table 9** are the same emission rates used to calculate emissions in the FSA.

Air Quality Table 9
Simple-Cycle Startup and Shutdown Emission Rates (Per Unit)

Simple-Cycle	Event Duration	NOx	CO	VOC	SOx	PM10/2.5
Startup (lbs/event)	30 (min)	16.6	15.4	2.80	0.82	3.12
Startup (lbs/hour)		20.7	15.4	3.95	< 1.62	< 6.23
Shutdown (lbs/event)	13 (min) 0.22 (hr)	3.12	28.1	3.06	0.35	1.35
Shutdown (lbs/hour)		9.56	34.4	4.86	< 1.62	< 6.23

Source: CEC 2016 (Table 23)

The expected maximum daily, monthly, and annual emissions for the SCGTs are determined by factoring in potential startup and shutdown events with steady-state operation. The license for the SCGTS is structured in the same manner as the CCGTs: there are limits on startup and shutdown events and annual emissions, and monitoring requirement for compliance determinations.

AES is proposing changes to the SCGT annual operating profile used to determine annual emissions. In AES 2019, AES proposed to decrease the SCGT annual operating hours from 2,360 hours to 1,060 hours per unit. However, the FSA and SCAQMD Final Determination of Compliance based the annual SCGTs operating hours on 2,358 hours per unit. Therefore, a decrease of 1,300 hours would change 2,358 to 1,058 hours per unit. The proposed operating profile for the SCGTs is included in **Air Quality Table 10**. There are no proposed changes to the daily or monthly operating profiles. There are no proposed changes to the maximum daily or monthly operating profiles, or annual startup and shutdown hours of operation.

Air Quality Table 10
Simple-Cycle Operating Profile (Per Unit)

Operating Parameters	Events	Hours
Daily		
Startup	2	1
Shutdown	2	0.44
Steady-State	--	22.56
Total Daily	--	24
Monthly		
Startup	62	31
Shutdown	62	13.43
Steady-State	--	700
Total Monthly	--	744
Annual		
Startup	500	250
Shutdown	500	108.33
Steady-State		700
Total Annually		1,058

Source: CEC 2016 (Table 25), SCAQMD 2020, Staff Analysis

Air Quality Table 11 includes the estimated maximum daily, monthly, and annual emissions (including startup and shutdown operations) for the SCGTs after the commissioning period. The emissions are calculated based on the equipment emission rates and operating profiles for each emission unit. There are no proposed changes to the calculated maximum daily and monthly emissions from the FSA. The proposed decrease in SCGT steady-state operating hours results in a decrease to the potential annual emissions of NOx, CO, VOC, SOx, and PM10/2.5.

Air Quality Table 11
Proposed Simple-Cycle Maximum Daily, Monthly, and Annual Emissions (Per Unit)

Simple-Cycle	NOx	CO	VOC	SOx	PM10/2.5
Daily (lb/day)	225.11	177.47	63.61	38.89	149.49
(FSA, lb/day)	(225.11)	(177.47)	(63.61)	(38.89)	(149.49)
Monthly (lb/month)	6,983.64	5,504.00	1,973.32	1,206.55	4,638.14
(FSA, lb/month)	(6,983.64)	(5,504.00)	(1,973.32)	(1,206.55)	(4,638.14)
Annual (lb/year)	15,600	24,534	4,533	573	6,596
(FSA, lb/year)	(26,2600	(29,730)	(7,510)	(1,275)	(14,695)
Annual (tons/year)	7.80	12.27	2.27	0.29	3.30
(FSA, tons/year)	(13.13)	(14.87)	(3.76)	(0.64)	(7.35)

Source: CEC 2016, CEC 2016a (FSA Table 31), SCAQMD 2020, Staff Analysis

Ammonia Emissions

Ammonia is injected into the flue gas stream as part of the SCR to control NOx emissions. However, not all of the ammonia reacts to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered from the stacks as ammonia slip.

Per BACT, SCAQMD requires a maximum ammonia slip rate of 5.0 ppm. In the FSA, the maximum hourly ammonia emission rates for steady-state operations from the CCGT SCR/CO oxidation catalyst systems were based on Case 1 and Case 4 ammonia emission rates contained in the operating scenario table. In the change in operating hours application to the SCAQMD, AES used ammonia emission rates based on calculations using the heat input from Case 1 and Case 4 conditions. The resulting ammonia emission factors are slightly higher based on differences in calculating methods (generally due to rounding). There are no proposed changes to the SCGT or

auxiliary boiler maximum hourly and annual hour ammonia emission rates. The expected ammonia emissions from the facility are included in **Air Quality Table 12** based on the proposed changes to the CCGT and SCGT annual operating hours.

Air Quality Table 12
Ammonia Emissions, (Per Unit)

Equipment	Maximum Hourly Rate (lbs/hr)	Annual Hourly Rate (lbs/hr)	Maximum Annual (lbs/year)	Maximum Annual (tons/year)
CCGT	15.74	15.57	101,879.79	50.94
CCGT (FSA)	(15.7)	(15.1)	(70,004)	(35.0)
SCGT	6.09	6.07	6,422.06	3.21
SCGT (FSA)	(6.09)	(6.07)	(14,313)	(7.16)
Auxiliary Boiler	0.16	0.05	423	0.22

Source: CEC 2016 (Table 33), SCAQMD 2020, Staff Analysis

Proposed Facility Emissions

Air Quality Table 13 includes the proposed post-commissioning annual operation emissions for the two CCGTs (including both the CCGT SCR/CO catalysts), four SCGTs (including both the SCGT SCR/CO catalysts), auxiliary boiler, CCGT Oil/Water separator, and SCGT Oil/Water Separator. There are no expected emissions from the CCGT and SCGT ammonia tanks included in **Air Quality Table 13. Air Quality Table 13** includes the calculated emissions from each category based on the operating profile evaluated in the FSA for comparison. There are no proposed changes to the auxiliary boiler or oil water separators emissions.

Air Quality Table 13
Proposed Facility Total Annual Emissions (tons/year)

Equipment	NOx	CO	VOC	SOx	PM10/2.5	NH_3
Total CCGTs	121.20	194.72	63.49	10.48	55.63	101.88
(FSA CCGTs)	(83.86)	(180.54)	(52.66)	(7.44)	(39.44)	(70.0)
Total SCGTs	31.20	49.09	9.07	1.15	13.19	12.85
(FSA SCGTs)	(52.52)	(59.48)	(15.04)	(2.56)	(29.39)	(28.64)
Auxiliary Boiler	0.68	3.63	0.61	0.19	0.68	0.22
CGTs Separators	----	----	0.0001	----	----	----
Proposed Total:	153.08	247.43	73.17	11.82	69.51	114.94
Previous Total:	(137.05)	(243.63)	(68.30)	(10.17)	(69.51)	(98.84)
Difference:	+16.03	+3.80	+4.87	+1.65	0.00	+16.10

Source: CEC 2016, CEC 2016a (Table 31), SCAQMD 2020, SCAQMD 2020a, Staff Analysis

As demonstrated in **Air Quality Table 13,** the proposed changes would result in annual emission increases for NOx, CO, VOC, SOx, and ammonia. Mitigation for these increases is discussed below in the Mitigation Section. There are no proposed facility PM10/2.5 emission increases.

Commissioning Year

Emissions of NOx, CO, and VOC during a commissioning period are generally greater than normal operations. The SCAQMD NOx RECLAIM holdings used for facility offsets are based on the maximum annual emissions including a commissioning year. The maximum commissioning year emissions include the total emissions from the commissioning period added to the maximum routine operating emissions for the remaining time frame. The commissioning emissions from Power Block 1 include commissioning from the CCGTs and the auxiliary boiler. The commissioning emissions from Power Block 2 include the SCGTs.

In the FSA, the CCGT commissioning year included emissions from the commissioning period and from six months of routine operation. The six months of CCGT routine operation was conservatively calculated using the maximum monthly emissions and multiplying by six. The proposed change to the NOx non-cold startup limits increases to the CCGT maximum monthly NOx emissions and also results in an increase to the CCGT commissioning year NOx emissions. **Air Quality Table 14** includes the re-calculated maximum commissioning year emissions for NOx using the proposed non-cold startup NOx emission.

The auxiliary boiler had a minimal commissioning period and commissioning emissions were assumed to be equivalent to startup operations. There are no proposed changes to the annual operational emissions used to calculate the auxiliary boiler commissioning year emissions.

The expected commissioning year emissions for the SCGTS were re-calculated based on the proposed changes to annual operations. The SCGTs commissioning period is expected to last three months. In the FSA, the SCGT commissioning year emissions were calculated in the same manner as the CCGT commissioning year emissions. The FSA SCGT commissioning year included emissions from the 3-month commissioning period and from nine months of routine operation. The nine months of SCGT routine operation was conservatively calculated using the maximum monthly emissions and multiplying by nine. Given the proposed reduction in annual hours for the SCGTs, this method overpredicts the expected SCGT emissions. Therefore, the SCGT commissioning year emissions were re-calculated by conservatively adding the expected SCGT commissioning emissions and a year of SCGT normal operations using the proposed annual operating schedule. The re-evaluated SCGT commissioning year emissions are lower than the commissioning year emissions evaluated in the FSA.

Air Quality Table 14 includes the proposed annual commissioning year emissions for the AEC and the previously calculated commissioning year emissions.

Air Quality Table 14
Maximum Annual Emissions, Commissioning Year

Equipment	NOx	CO	VOC	SOx	PM10/2.5
CCGT (lb/year)	112,607	249,162	60,146	26,536	46,410
(FSA, lb/year)	(108,377)	(249,162)	(60,146)	(26,536)	(46,410)
SCGT (lb/year)	21,322	49,938	5,369	1,027	8,340
(FSA, lb/year)	(68,575)	(74,931)	(18,596)	(11,312)	(43,487)
Auxiliary Boiler (lb/year)	1,351	7,256	1,223	382	1,362
(FSA, lb/year)	(1,351)	(7,256)	(1,223)	(382)	(1,362)

Source: CEC 2016, CEC 2016a (Table 32), SCAQMD 2020, SCAQMD 2020a, Staff Analysis

Estimated Heat Input

Air Quality Table 15 includes the expected hourly, daily, monthly, and annual heat input (in the form of fuel) for normal operation (excluding commissioning). It is used to calculate GHGs. Case 1 conditions are used to determine the expected hourly, daily and monthly heat input for the CTGs. Case 4 conditions are used to determine the expected annual heat input for the CTGs. The proposed changes would not change the expected heat input for the auxiliary boiler. The heat input for the boiler is based on the maximum rating for the hourly and daily total, and a reduced load for the monthly and annual totals.

Air Quality Table 15
Proposed Equipment Heat Input

Equipment	Hourly Rate (MMBtu/hr)	Daily Rate (MMBtu/day)	Monthly Rate (MMBtu/month)	Annual Rate (MMBtu/yr)
CCGT	2,275	54,600	1,692,600	14,722,986
Total CCGTs	4,550	109,200	3,385,200	29,445,972
SCGT	879	21,096	653,976	926,434
Total SCGTs:	3,516	84,384	2,615,904	3,705,737
Auxiliary Boiler	70.8	535	16,057	189,120
Proposed Total:	8,137	194,119	6,017,161	33,340,829
Previous Total [a]:	(8,137)	(194,119)	(6,017,161)	(29,326,924)
Difference:	0	0	0	+4,013,905

Source: CEC 2016 (Table 30), SCAQMD 2020, Staff Analysis
Note [a]: The previous daily total listed in the FSA Table 30 is 194,127 MMBtu/day. This difference is due to rounding discrepancy in the CCGT daily rate FSA. There is no actual decrease in the proposed daily heat input for the facility.

Monthly Emission Rates

Air Quality Table 16 includes the expected CCGT monthly emission rates and fuel usage data to calculate emissions for pollutants that are not monitored by a certified CEMS or during periods of time when the CEMS are not available, such as the period after commissioning and prior to CEMS certification. The CCGT monthly emission rates are included in conditions of certification **AQ-A1** and **AQ-A5**. The expected monthly emission rates are calculated by dividing the expected monthly emissions included in

Air Quality Table 7 by the monthly heat input in **Air Quality Table 15**. The monthly heat input is converted to million cubic feet (mmcf) for the calculation (1,692,600 MMBtu/month * mmcf/1,050 MMBtu = 1,612 mmcf)). The proposed annual operation rate does not impact the monthly emission rates currently included in **AQ-A1** and **AQ-A5.** The proposed increase to the monthly NOx emissions from the proposed non-cold startup NOx emission limit results in a higher NOx emission rate shown in **AQ-A5.**

Air Quality Table 16
Monthly CCGT Emission Rates (Per Unit)

Combined-Cycle	NOx	CO	VOC	SOx	PM10/2.5
Monthly (lb/month)	14,168.25	24,638.99	7,577.38	3,615.84	6,324.00
(FSA, lb/month)	(13,463.25)	(24,638.99)	(7,577.38)	(3,615.84)	(6,324,00)
Monthly (lb/mmcf)	8.79	15.28	4.70	2.24	3.92
(FSA, lb/mmcf)	(8.35)	(15.28)	(4.70)	(2.24)	(3.92)

Source: CEC 2016, SCAQMD 2020, SCAQMD 2020a, Staff Analysis

Currently **AQ-A1** requires CCGT CO emissions to be calculated using monthly emission rates in **Air Quality Table 16** and the fuel usage. **AQ-A2** requires SCGT CO emissions to be calculated in a similar manner. AES is proposing to use a CO CEMS to demonstrate compliance with the CO emissions requirements for the CCGTs and SCGTs instead of the CO emission factors currently included in the conditions of certification. Staff supports the use of a certified CEMS for determining compliance. Staff recommends the addition of new language in **AQ-A1** and **AQ-A2** requiring the use of a certified CO CEMS. The language clarifies the CO CEMS would be used to monitor emissions after the commissioning period when the CO CEMS is certified.

BACT/LAER ANALYSIS

The proposed changes would not increase the daily emission rate for the CCGTs or SCGTs. Per SCAQMD Regulation XIII, the proposed changes would not currently trigger a revised BACT/LAER analysis for the CCGTs or SCGTs. See the Prevention of Significant Deterioration Section below for a discussion of PSD BACT requirements.

There are periods of operation, such as startups, when it is not technically feasible for the CGTs to meet BACT limits. Alternative BACT is aimed at limiting and minimizing emissions during this period. The NOx emission limit during the non-cold startups is considered alternative BACT and is included in **AQ-C1.** The proposed non-cold startup NOx emission limit is still lower than comparable equipment and would still be considered alternative BACT for this source and category.

Because AEC is a multi-phased construction project, **AQ-E14** requires the BACT/LAER determination for Phase 2 to be reviewed and modified prior to the start of construction. Staff is proposing to update the **AQ-E14** equipment applicability to clearly identify only Phase 2 equipment. This includes updating the applicability in **AQ-E14** and removing **AQ-E14** from the CCGT section of the table. **AQ-E2** establishes requirements regarding the construction of Phase 2. Staff is proposing to amend **AQ-E2** to reflect the updated construction date for Phase 2 from May 31, 2020 to June 30, 2022.

PM2.5 FEDERAL NEW SOURCE REVIEW PROGRAM

The SCAQMD adopted Rule 1325 to incorporate U.S. EPA requirements for PM2.5 into SCAQMD rules and regulations. Rule 1325 established offset ratios, LAER compliance and control of PM2.5 precursors. On November 4, 2016, the SCAQMD amended Rule 1325 to establish appropriate major stationary source threshold for direct PM2.5 and PM2.5 precursors. The SCAQMD lowered the major polluting facility threshold from 100 tons per year to 70 tons per year. Rule 1325 was amended again on January 4, 2019 to expand the definition of PM2.5 precursors to include VOC and NH_3. Source test results for PM2.5/PM10 will be used to validate the emission factors used for Rule 1325 compliance.

In the SCAQMD evaluation for the change to the auxiliary boiler commissioning hours, the SCAQMD updated the PM2.5 facility emission limit to reflect the updated Rule 1325 requirements. Staff made the same update to **AQ-F1**. SCAQMD performed a full Rule 1325 analysis as part of the CCGT and SCGTs operation changes amendment. The SCAQMD determined that the date of construction of the CCGTs occurred prior to the applicability date of the Rule 1325 updates. Rule 1325 is not applicable until a major modification occurs at the facility. Therefore, staff proposes to retain the original **AQ-F1** facility PM2.5 requirement of 100 tons per year and add condition **AQ-E15** requiring a Rule 1325 compliance review prior to construction of the SCGTs.

IMPACTS ANALYSIS

Air dispersion models provide a means of predicting the location and ground level magnitude of the impacts of a new or modified emissions source. The model results are generally described as maximum concentrations, often described as a unit of mass per volume of air, such as micrograms per cubic meter (mg/m^3).

The proposed change in operating hours only impacts annual emissions. There are annual AAQS for NO_2, PM2.5, and PM10. AES initially proposed a qualitative approach to address potential impacts to the proposed annual emissions increases. A full modeling analysis was completed during the licensing period. AES noted the annual NO_2 contribution from the AEC was low compared to the NO_2 background concentrations. Therefore, AES concluded the proposed increase to the annual NO_2 emissions would not result in a significant impact. In addition, AES noted they completed an annual PM10 NAAQS and a SCAQMD Rule 1303 significant change threshold evaluation for PM10 for the SCAQMD Final Determination of Compliance (FDOC) during the licensing period. AES concluded the results from the previous analysis would indicate the proposed annual emissions increases would also not change the conclusions in the FDOC impact analysis.

The SCAQMD responded that the qualitative reasoning provided by AES was not sufficient to avoid remodeling. The SCAQMD requested re-modeling for NO_2, PM10 and PM2.5 based on the total emissions from each turbine and auxiliary boiler for the annual averaging period to update the SCAQMD evaluation and support the CEC analysis. SCAQMD noted the available measured background data from surrounding monitoring stations does not capture annual AEC emissions since AEC is a new facility

that has not fully transitioned to operations. Therefore, the air dispersion modeling should be based on total emissions and not emission increases.

In addition, the dispersion modeling and health risk assessment are required to be updated using the most recent background concentrations, meteorological data, and modeling programs and guidelines. During the AEC licensing period, the annual NO_2 modeling included a NO_2 to NOx conversion ratio of 0.75. This approach, referred to as he Ambient Ratio Method, has been updated by the U.S. EPA. Therefore, the SCAQMD required the revised annual NO_2 modeling to use the updated U.S. EPA Ambient Ratio Method 2 (ARM2).

AES conducted air dispersion modeling using American Meteorological Society/Environmental Protection Agency Regulatory Model known as AERMOD to analyze potential ambient air quality impacts associated with the operation of AEC. The U.S. EPA designates AERMOD as a "preferred" model for refined modeling in all types of terrain. AERMOD considers emissions in the context of various ambient meteorological conditions, local terrain and nearby structures that could affect air flow.

AES used AERMOD version 18081 to perform the modeling and followed the SCAQMD Modeling Guidance for AERMOD. The analysis includes the following:

- Use of AERMOD meteorological data from the North Long Beach meteorological station from 2012 through 2016 (SCAQMD confirmed this was the most recent available meteorological data at the time of the application).
- Receptor grids with appropriate locations and spacing meeting SCAQMD requirements.
- Use of ARM2 with the minimum and maximum NO_2/NOx U.S. EPA default values of 0.5 and 0.9 respectively.
- Use of URBAN dispersion options using Los Angeles County population of 9,862,049.
- Use of the updated CCGT stack heights of 150 feet.

Data collected from the North Long Beach meteorological station was also used as representative meteorological data for the modeling during the licensing period. The station is the closest to the proposed site, there is no complex terrain between the station and the proposed site, and the land uses surrounding the monitoring site and AEC are similar.

AES modeled the combined operations of the CCGTs, SCGTS and auxiliary boiler to determine the potential operational annual impact. Identical to the FSA, AES used Case 7 as the representative worst-case scenario for the normal operating hours in the annual modeling scenario for the CCGTs and SCGTs. For the CCGTs, AES modeled both CTGs at 6,005 normal operating hours, 500 startups, and 500 shutdowns. For the auxiliary boiler, AES modeled operations at 30 percent of the maximum firing rate for 8,760 hours, including 24 cold startups, 48 warm startups and 48 hot startups.

The SCAQMD Planning, Rule Development & Area Sources (PRDAS) staff reviewed the dispersion modeling analysis and health risk assessment results. PRDAS staff independently reproduced the modeling analysis to verify compliance with the SCAQMD rules. The PRDAS staff noted a couple of small discrepancies that do not affect the modeling results at the reported precision. The first discrepancy is with the SCAQMD population requirement. The current SCAQMD guidelines require a population of 9,818,605.

In addition, AES originally modeled different NOx and PM10/PM2.5 emission rates for the CCGTs and SCGTs. The different emission rates are due to rounding of the proposed hours of operation. The PRDAS staff incorporated the proposed increase to the non-cold startup NOx emission rate for the annual averaging period. **Air Quality Table 17** compares the annualized hourly emission rates modeled by AES, SCAQMD, and the FSA.

Air Quality Table 17
Annualized Modeled Hourly Emission Rates

Equipment	NOx	PM10/2.5
SCAQMD CCGT (lb/hr)	9.15	6.35
AES CCGT (lb/hr)	8.49	6.49
(FSA CCGT, lb/hr)	(6.24)	(6.35)
SCAQMD SCGT (lb/hr)	1.53	0.75
AES SCGT (lb/hr)	1.51	0.71
(FSA SCGT, lb/hr)	(2.29)	(1.68)
Auxiliary Boiler (lb/hr)	0.15	0.15
(Auxiliary Boiler FSA, lb/hr)	(0.15)	(0.15)

Source: AES 2019, CEC 2016 (Tables 34, 35, and 36), SCAQMD 2020

Air quality impact analyses combine a project's modeled impact with background concentrations to determine the total impact of a project. Background or baseline concentrations are determined from the measured values at the surrounding representative air monitoring sties.

Staff reviewed the most recent background data available from the surrounding monitoring stations. The South County Los Angeles County 2 (SCLA2) -South Long Beach station is located approximately 4.6 miles northwest of the project site. The South County Los Angeles County 1 (SCLA1) -North Long Beach station (SCLA1) is located 6.4 miles northwest of the project site. The South Coastal Los Angeles 3 (SCLA3) -Hudson Long Beach station is located approximately 7.2 miles northwest of the project site. Monitoring data for NO_2 was available from SCLA3. Monitoring data for PM10 was available from SCLA2 and SCLA3. Monitoring data for PM2.5 was available from SCLA2 and SCLA1. AES reviewed data from 2014 to 2016 to determine background values. At the time AES performed the modeling analysis, that was the most current data available. Staff reviewed background monitoring data from 2014 to 2018. **Air Quality Table 18** includes annual background concentrations for NO2,

PM10, and PM2.5 from SCLA1, SCLA2, and SCLA3. Data in bold indicates the background levels for PM10 are above the annual PM10 CAAQS.

Air Quality Table 18
Annual Average Pollutant Concentrations, 2014-2018 (ppm µg/m³)

Pollutant	Station	2018	2017	2016	2015	2014
NO_2 (ppm)	SCLA3	0.0173	0.0179	0.0185	0.0198	0.0207
PM10 (µg/m³)	SCLA2	**23.9**	**27.3**	**27.8**	**26.5**	**26.6**
	SCLA3	**32.3**	**33.3**	**31.9**	**31.5**	**29.6**
PM2.5 (µg/m³)	SCLA1	10.99	10.9	10.36	10.81	11.42
	SCLA2	11.15	11.03	9.62	10.26	10.72

Source: AES 2019, SCAQMD 2020, SCAQMD 2020a, SCAQMD 2020b, Staff Analysis

Air Quality Table 19 summarizes the predicted maximum ground-level concentrations for NO_2, PM10, and PM2.5 from the proposed annual operations of AEC. **Air Quality Table 19** includes the highest background values from the surrounding monitoring stations and compares the total impact to the limiting AAQS. The values shown in bold indicate an exceedance of an air quality standard. **Air Quality Table 19** also includes the project impact from the FSA in parenthesis for comparison.

Air Quality Table 19
Proposed Total Project Operational Impacts, (µg/m³)

Pollutant	Averaging Period	Project Impact (mg/m³)	Background (mg/m³)	Total Impact (mg/m³)	Limiting Standard (mg/m³)	Percent of Standard
NO_2	Annual	0.39	38.9	39	57	69%
(FSA NO_2)	(Annual)	(0.20)	(48)	(48)	(57)	(84%)
PM10	Annual	0.30	**33.3**	**34**	20	**168%**
(FSA PM10)	(Annual)	(0.19)	**(27.3)**	**(27.49)**	(20)	**(137%)**
PM2.5	Annual	0.30	11.42	12	12	98%
(FSA PM2.5)	(Annual)	(0.19)	(10.97)	(11.16)	(12)	(93%)

Source: AES 2019, CEC 2016 (Table 37), SCAQMD 2020, SCAQMD 2020a, SCAQMD 2020b, Staff Analysis

The modeling results in **Air Quality Table 19** indicate potential impacts from the proposed changes would not cause a significant impact for annual NO_2 or PM2.5. Background levels for PM10 at the surrounding monitoring sites are already above the annual PM10 CAAQS without any contribution from the project. Therefore, the proposed project could contribute to existing violations of the annual PM10 CAAQS.

SCAQMD has different compliance requirements for attainment and nonattainment pollutants. For projects in nonattainment areas, SCAQMD requires modeling to demonstrate a project would not cause an exceedance of the significant change thresholds specified in Rule 1303. For projects located in attainment areas, SCAQMD requires a demonstration that the project emissions plus background concentrations would not potentially cause a violation to any AAQS. SCAQMD 1303 thresholds for PM10 and PM2.5 are both 1 mg/m³. The modeling results in **Air Quality Table 19**

demonstrate the PM10 and PM2.5 impacts are below the SCAQMD significant change thresholds.

The FSA assessed two conservative scenarios to determine potential worst-case impacts from overlapping periods of construction, commissioning, and operation of AEC. An overlap scenario was developed including the AEC SCGT construction with simultaneous operation of the CCGT and operation of existing AGS boilers Units 3, 4, and 6 (Unit 6 was later replaced by Unit 5). This scenario was referred to as Overlap Scenario 2 and produced the highest project impacts. **Air Quality Table 20** summarizes the results of the modeling analysis for the modeled Overlap Scenario 2.

Air Quality Table 20
Proposed Maximum Overlap Scenario 2 Impacts, (µg/m³)

Pollutant	Averaging Period	Project Impact (mg/m³)	Background (mg/m³)	Total Impact (mg/m³)	Limiting Standard (mg/m³)	Percent of Standard
NO_2	Annual	0.93	48	49	57	85%
PM10	Annual	2.24	**27.3**	29.5	20	**148%**
PM2.5	Annual	0.76	10.97	11.73	12	98%

Source: CEC 2016 (Table 43)

The background PM2.5 concentration used for the normal operation scenario is higher than the background selected during the licensing period. As shown in **Air Quality Table 18**, the higher background limit was from 2014 and appears to be higher than all other years. Staff would usually not include a value from six years prior as the representative background concentration. This value was selected because it was the most conservative and it was included in the AES application as the representative background PM2.5 value (AES 2019, Table 3.1-3).

There is uncertainty of how the proposed operation increases for the CCGT would affect the Overlap Scenario 2 assessment since an updated modeling assessment was not performed. At the time of licensing, the results indicated the predicted annual PM2.5 would be below the annual AAQS for PM2.5. The background concentration drives the conclusion. There is additional uncertainty with the degree of future operation of the existing AGS boilers. The construction of the SCGT is now scheduled for 2023. The State Water Board amendment proposes to extend the retirement of Boilers 3, 4, and 5 until December 31, 2023. There is still the possibility of overlap of SCGT construction with the operation of the CCGT and AGS boilers.

Construction periods are considered short-term operations. The construction period for the SCGT is expected to commence in the third quarter of 2022 and last until December 2023. However, there is still uncertainty with the details of the SCGT construction. The Decision approved mitigation for the AEC's potential contribution to violations of PM10 AAQS during operations and construction. Many of the same mitigation measures for PM10 would also mitigate PM2.5. Instead of requiring the Overlap Scenario 2 to be re-modeled with the CCGT operational updates at this time, staff is proposing the addition of Condition of Certification **AQ-SC12**. **AQ-SC12** would require the project owner to notify the CEC prior to the start of the SCGT construction and submit an updated Air

Quality Construction Mitigation Plan (AQCMP) for the SCGT. The AQCMP for the SCGT would require a re-evaluation of the construction mitigation measures conditions (the AQ-SC series) and outline any changes to PM2.5 best management practices. The AQCMP would be submitted to the SCAQMD for input and the CEC Compliance Program Manager for approval. Staff notes that the current construction mitigation in the AQ-SC series for PM10 also mitigates the PM2.5 emissions and represents the current best management practice for PM2.5 construction mitigation measures. The air quality conditions already include a requirement for the SCGT BACT evaluation to be reviewed at the time of SCGT construction. Re-evaluating the construction staff conditions mitigation measures (the AQ-SC series) at this point would ensure that all best management measures applicable at the actual start of construction are evaluated.

MITIGATION

The Final Commission Decision required mitigation for AEC for all modes of operation. The required mitigation met the requirements under SCAQMD rules and regulations and CEC mitigation requirements.

The SCAQMD rules and regulations include provisions for utility boiler replacement projects when there is no increase in megawatt capacity. The provisions allow for the CCGT and SCGT PM10, SO_2, and VOCs emission offsets to be secured from the SCAQMD internal offset accounts. The SCAQMD internal offset determination methodology considers potential emissions on a 30-day average and additional offset factors (1.0 for PM10 and SOx and 1.2 for VOCs). The 30-day average is the maximum monthly emissions divided by 30 days. There are no proposed changes to the 30-day averages or offset factors for PM10, SO_2, and VOCs. The SCAQMD internal offset program continues to meet CEC mitigation requirements.

SCAQMD requires a fee for the use of the internal offsets. The fee is calculated separately for each applicable pollutant based on attainment status, potential to emit, megawatt ratings, capacity, operating hours, and previous generation. Currently, AES is on an annual payment plan. AES provided the first-year payment as required, prior to the issuance of the SCAQMD Permit to Construct. The SCAQMD re-evaluated the fees based on the current figures and the next payment will be due a year after the first-fire or October 3, 2020.

The auxiliary boiler and the oil/water separators were not eligible for offsets from the SCAQMD internal accounts. AES secured PM10, SO_2, and VOC emission reduction credits (ERCs) on the open market to offset the auxiliary boiler and oil/water separators. The SCAQMD uses the 30-day average for offset determinations for non-exempt equipment. The auxiliary boiler 30-day average is based on the highest emissions from any month, including commissioning. The mitigation for the auxiliary boiler in the Final Commission Decision for VOC, SOx, and PM10 in the form of ERCs met both SCAQMD and CEC requirements. There are no proposed changes to any of the operations of the auxiliary boiler or oil water separators.

CO is an attainment pollutant and is not a precursor to any nonattainment pollutant. During the original CEC licensing, AES provided modeling demonstrating the proposed

project would not cause or contribute to violation of the CO AAQS. The CO AAQS are based on 1-hr and 8-hr averaging periods. There are no proposed changes that would impact shorter term operations. Therefore, offset requirements for CO continue to not be applicable for AEC.

AES is required to hold NOx RECLAIM Trading Credits (RTCs) to mitigate NOx emissions from the facility. The SCAQMD requires RTCs to cover the first compliance year. Maximum commissioning year emissions were used to determine the first year RECLAIM requirements. **Air Quality Table 21** includes the first year NOx RECLAIM requirement, including commissioning, for the CCGTs, SCGTs, and auxiliary boiler. AES has not provided a date to install, and provide offsets for, the SCGT phase.

Air Quality Table 21
First Year RECLAIM Commissioning Year

Equipment	NOx
Total CCGTs and Boiler (lb/year)	225,214
(FSA, lb/year)	(218,105)
Total SCGTs (lb/year)	85,288
(FSA, lb/year)	(274,300)

Source: CEC 2016 (Table 46), SCAQMD 2020, SCAQMD 2020a, Staff Analysis

For existing RECLAIM facilities, the SCAQMD requires modeling on a permit unit basis to demonstrate the project would not result in a significant increase in the NO_2. The thresholds and standards are only applicable to the highest modeled concentrations corresponding to the combined-cycle turbine. **Air Quality Table 22** includes the modeled results for a single CCGT demonstrating the impact from the increase in annual operating hours and non-cold startup NOx emission limit is below the SCAQMD rule thresholds.

Air Quality Table 22
SCAQMD Rule 2005 Modeled NO_2 for Each CCGT, ($\mu g/m^3$)

Pollutant	Averaging Period	Project Impact (mg/m^3)	Background (mg/m^3)	Total Impact (mg/m^3)	Limiting Standard (mg/m^3)	Exceed
NO_2 CCGT-1	Annual	0.17916	39.6	39.8	57	No
NO_2 CCGT-2	Annual	0.17835	39.6	39.8	57	No

Source: CEC 2016 (Table 54), SCAQMD 2020, SCAQMD 2020a, Staff Analysis
Notes: The SCAQMD NO_2 background

Existing conditions of certification will ensure the project stays in compliance with all RECLAIM requirements. AES is required to use non-resettable fuel meters to record fuel usage and NOx CEMS for the CCGTs, SCGTs and auxiliary boiler.

The proposed changes would result in an increase to the CCGT RECLAIM holdings and a decrease to the SCGT RECLAIM holdings. Staff recommends updating The RECLAIM requirements in **AQ-I1** and **AQ-I2** to the re-calculated RECLAIM holdings required in **Air Quality Table 21.**

As discussed, there are no proposed changes to the VOC, SOx, or PM10/2.5 monthly emissions. Therefore, there are not proposed changes to the 30-day VOC, SOx, and PM10/2.5 emission averages used to determine SCAQMD offset requirements.

PREVENTION OF SIGNIFICANT DETERIORATION

The Prevention of Significant Deterioration (PSD) program has been established to prevent the deterioration of air quality in areas that are in attainment with the primary NAAQS. The SCAQMD is in attainment for NOx, SOx, CO, and PM10.

The SCAQMD-issued PSD permit became effective on May 22, 2017. AES originally applied to modify the SCAQMD-issued permits in early 2019, prior to AEC transitioning to an operational plant. The SCAQMD updated the PSD analysis considering AEC a new source and AGS remaining as an existing major source.

PSD requirements apply to significant increases in emissions from a major stationary source or a major modification to a minor source, on a pollutant specific basis. Significant emission increases are defined as potential annual emission increases of 100 tons or more for CO, 40 tons or more of NOx and SO_2, and 15 tons or more for PM10. **Air Quality Table 23** demonstrates that AEC is over the significance threshold for CO, NOx, and PM10; however, there is only net emission increase for CO and PM10 when considering the established baseline emissions for the AGS.

Air Quality Table 23
Prevention of Significant Deterioration Applicability

	CO	NOx	SO_2	PM10
AGS PTE (tons/year)	21,872	636	50	627
Major Source	Yes	Yes	Yes	Yes
AGS Actual Emissions -2013-2014 (tons/year)	288	47	5	11
AEC PTE (tons/year)	247	153	12	70
Significance Threshold	100	40	40	15
Significant Emission Increase	Yes	Yes	No	Yes
Net Emission Increase = AEC PTE – AGS Actual (tons/year)	- 41	106	7	59
Net Significant Increase	No	Yes	No	Yes
PSD Applicability	No	Yes	No	Yes

Source: CEC 2016 (Table 53), SCAQMD 2020, SCAQMD 2020a

Therefore, NOx and PM10 are subject to PSD review for all PSD requirements and CO and SO_2 are only subject to PSD BACT requirements.

PSD requires BACT for each emission unit with a net emission increase. The proposed change to operation does not trigger a re-analysis of the CCGTs BACT limits because there are no proposed daily emission increases associated with the proposed changes. Phased projects require BACT to be reviewed and modified as appropriate at the latest reasonable time, but prior to 18 months before construction of each independent phase. **AQ-E14** requires the SCGT BACT analysis to be reviewed prior to construction of Phase 2.

AES provided revised modeling to demonstrate the expected facility-wide annual impacts for NO_2 and PM10 would remain below the Class II significant impact levels (SILs) and Class I SILs at a distance of 50 kilometers downwind. The modeling also demonstrated the maximum predicted impact for annual NO_2 would remain below the federal secondary NAAQS. The PRDAS reviewed the modeling and updated background concentrations and impacts using data from the PRDAS modeling results where applicable.

Air Quality Table 24 summarizes the results of the Class II SIL analysis for annual NO_2 and PM10. The predicted maximum impacts for annual NO_2 and PM10 are less than their respective Class II SILs. Therefore, the annual impacts for NO_2 and PM10 are considered less than significant and no further Class II analysis is required. **Air Quality Table 24** includes the PSD Class II increment standard comparison for informational purposes. The annual impacts for NO_2 and PM10 are considered less than the PSD Class II increment standard.

Air Quality Table 24
Maximum Modeled SILs
Compared to Class II SILs and PSD Increment Standards, (µg/m³)

Pollutant	Averaging Period	Project Impact (mg/m³)	Class II SIL (mg/m³)	Significant (mg/m³)	PSD Class II Standard (mg/m³)	Exceed Class II SIL
NO_2	Annual	0.4	1.0	No	25	No
PM10	Annual	0.3	1.0	No	17	No

Source: SCAQMD 2020, SCAQMD 2020a

A Class I area impact analysis is required to demonstrate AEC would not adversely affect the air quality related values or contribute to an exceedance for either the Class I SILs or PSD Class I increments standards. **Air Quality Table 25** summarizes the results of the Class I SIL analysis for annual NO_2 and PM10. The predicted maximum impacts for annual NO_2 and PM10 are less than their respective Class I SILs. Therefore, the annual impacts for NO_2 and PM10 are considered less than significant and no further Class I analysis is required.

Air Quality Table 25
Maximum Modeled SILs Compared to Class I SILs (µg/m³)

Pollutant	Averaging Period	Project Impact (mg/m³)	Class I SIL (mg/m³)	Exceed Class II SIL
NO_2	Annual	0.007	0.1	No
PM10	Annual	0.005	0.2	No

Source: SCAQMD 2020

The SCAQMD PSD regulations require the evaluation of other impacts on growth, soil and vegetation, and visibility impairment. The proposed changes in annual operating hours are not expected to induce growth or result in impacts to soils and vegetation. The updated dispersion modeling demonstrating AEC compliance with the primary NAAQS would also demonstrate compliance with secondary NAAQS. There are no expected exceedances to the criteria for color contrast or plume contrast.

The SCAQMD PSD permit became effective on May 22, 2017. The SCAQMD completed all PSD noticing requirements for a new major stationary source at that time. The emission increases for the proposed operation change and non-cold startup NOx emission limit are not considered a major modification of an existing major stationary source for PSD purposes and there are no changes to any of the conclusions in the PSD permit. Therefore, additional PSD noticing is not required. The SCAQMD issued Title V and PSD permit are posted on the SCAQMD website.

GHGs are a regulated pollutant under the SCAQMD PSD major source permitting program. The PSD GHG evaluation is included below.

GREENHOUSE GAS ANALYSIS

The proposed changes to the annual operating hours for the CCGTs and SCGTs would result in changes to the calculated project GHG emissions. The GHG emissions are estimated using the calculated heat input in **Air Quality Table 15** and emission factors from U.S.EPA's Emission Factors for Greenhouse Gas Inventories. The carbon dioxide equivalent (CO_2e) is calculated by applying the global warming potential factors from Table A-1 of 40 CFR Part 98, Subpart A. **Air Quality Table 26** includes the estimated project GHG emissions. The proposed change to the CCGT and SCGTS operating hours would not result in any change to the auxiliary boiler GHG calculations or circuit breaker SF6 calculations. Therefore, increase in GHG emissions is calculated from the increase in heat input shown in **Air Quality Table 15**.

Air Quality Table 26
Estimated Potential Greenhouse Gas Emissions

Pollutant	Emission Factor (kg/MMBtu)	Global Warming Potential	CO_2e (lbs/year)	CO_2e (tons/year)
CCGT CO_2	53.06	1	1,722,237,130	861,118.57
CCGT CH_4	0.001	25	811,465	405.73
CCGT N_2O	0.0001	298	967,266	483.63
		Total CCGT (per unit):	**1,724,015,845**	**862,007.92**
Total CCGTs:			**3,448,062,970**	**1,724,015.84**
Boiler CO_2	53.06	1	22,122,706	11,061.35
Boiler CH_4	0.001	25	10,423	5.21
Boiler N_2O	0.0001	298	12,425	6.21
Total Boiler:			**22,145,554**	**11,072.78**
SCGT CO_2	53.06	1	108,371,625	54,185.81
SCGT CH_4	0.001	25	51,061	25.53
SCGT N_2O	0.0001	298	60,865	30.43
		Total SCGT (per unit):	**108,483,551**	**54,241.78**
Total SCGTs:			**433,934,203**	**216,967.10**
CCGT Circuit SF_6	----	22,800	34,884	17.44
SCGT Circuit SF_6	----	22,800	114,228	57.11
Total Circuit SF_6			**149,112**	**74.55**
Power Block 1:			**3,470,212,128**	**1,735,106.06**
Power Block 2:			**434,048,431**	**217,024.21**
Total Project:			**3,904,260,558**	**1,952,130.28**
Project Increase:			**469,670,372**	**234,835**

Source: CEC 2017, SCAQMD 2020, Staff Analysis

The AEC facility was approved to replace four of the existing AGS boilers (Units 1, 2, 3, and 6). The license required the permanent shutdown of Units 1, 2, and 6 within 90 calendar days of the first fire of either CCGT-1 or CCGT-2 or by the end of 2019. The potential CO_2e emissions from AGS Units 1, 2, 3, and 6 is 5,986,477.31 tons per year. The potential CO_2e emissions from already retired AGS Units 1, 2, and 6 were 4,268,313.08 tons per year which is higher than the potential CO_2e emissions from the licensed AEC equipment included in **Air Quality Table 26**.

Greenhouse Gases Emission Performance Standard (SB 1368)

The operating schedule approved in the Decision indicated the AEC annualized plant capacity factor for both the combined-cycle and simple-cycle turbines was below 60 percent. Therefore, the AEC was not subject to the SB 1368 Greenhouse Gas Emission Performance Standard of 0.500 metric tons of carbon dioxide per megawatt-hour ($MTCO_2/MWh$). However, the Decision included an estimated annualized GHG performance calculation for Power Block 1 to demonstrate AEC would comply with the requirement if the actual operation approached the 60 percent capacity requirement.

The proposed increase in operating hours for the CCGTs could result in operations above a 60 percent capacity factor. **Air Quality Table 27** includes an estimated maximum annualized performance calculation. The estimated annual energy output conservatively assumed 1,318 hours of operation in a 1-on-1 configuration and 4,687 hours of operation in a 2-on-1 configuration. The CO_2 emissions include the estimated annual emissions based on the maximum calculated annual operating hours for the CCGTS and auxiliary boiler. Using the potential CO_2 emissions from full annual operations with a minimum base load scenario generates a maximum and therefore produces a conservative result. The actual expected CO_2 emissions from the base load scenario would be much lower. **Air Quality Table 27** demonstrates AEC would comply with the SB1368 performance standard using higher than expected CO_2 emissions.

Air Quality Table 27
AEC Power Block 1, GHG Performance Standard Compliance

AEC	CCTG and Auxiliary Boiler Operational CO2 Emissions ($MTCO_2/yr$) [a]
Power Block 1 CO_2 Emissions ($MTCO_2/yr$)	**1,572,448.38**
Estimated Annual Energy Output (MWh/yr)	**3,675,279**
Estimated Annualized GHG Performance ($MTCO_2/MWh$)	**0.43**

Note: [a] Auxiliary boiler contribution based on the expected annual average heat input rate.

Standards of Performance for Greenhouse Gas Emission for Electric Generating Units

On August 3, 2015, the U.S. EPA promulgated New Source Performance Standards Subpart TTTT-Standards of Performance for Greenhouse Gas Emissions for Electrical Generating Units (Title 40, Code of Federal Regulations, Part 60.5508) (Subpart TTTT). The notice was published in the Federal Register on October 23, 2015 and had an immediate effective date. Subpart TTTT-Standards of Performance for Greenhouse Gas Emissions for Electrical Generating Units sets standards to limit emissions of CO_2 from new, modified, and reconstructed power plants. Subpart TTTT- requirements are set under the authority of the Clean Air Act section 111(b) and are applicable to new fossil fuel-fired power plants commencing construction after January 8, 2014. The AEC CCGTS and SCGTs are subject to Subpart TTTT requirements.

Subpart TTTT has different requirements based on whether the emission unit is considered base load. According to Subpart TTTT, base load rating is defined as maximum amount of heat input that an electrical generating unit (EGU) can combust on a steady state basis at ISO conditions. Each EGU is subject to the standard if it burns more than 90% natural gas on a 12-month rolling basis and if the EGU supplies more than the design efficiency times the potential electric output as net-electric sales on a 3-year rolling average basis. An affected EGU supplying equal to or less than the design efficiency times the potential electric output as net electric sales on a 3-year rolling average basis is considered a non-base load unit and is subject to a heat input limit of 120 lbs CO_2/MMBtu. Each affected 'base load' EGU is subject to the gross energy output standard of 1,000 lbs of CO_2/MWh unless the Administrator approves the EGU being subject to a net energy output standard of 1,030 lbs CO_2/MWh.

During the licensing period, AES indicated the design efficiency of AEC is 56 percent on a lower heating value basis. If the CCGT block operates above the design efficiency of 56 percent (or 50 percent, whichever is less), the 1,000 lb CO_2/MWh-gross standard is applicable. Since 56 percent is greater than 50 percent, a design efficiency of 50 percent was used with the Case 12 operating scenario to determine if a CCGT supplies greater than 1,481,141 MWh-net electrical output to a utility distribution system on both a 12-operating-month and a 3-year rolling average basis the 1,000 lb CO_2/MWh-gross standard is applicable. If a CCGT supplies less than that, the CCGT is subject to the 120 lbs CO_2/MMBtu limit.

AES submitted a revised heat rate and electrical production profile for the AEC reflecting the proposed change in annual operating hours. The thermal efficiency calculations were updated based on the changes to the hours of operation. The revised CCGT profile assumes 1,318 hours of operation in a 1 on 1 configuration and 4,687 hours of operation in a 2 on 1 configuration. AEC provided thermal emissions calculations for a 45.94 percent capacity factor. The calculated GHG efficiency is 916.01 lb CO_2 /MWh-HHV-gross (with 8 percent degradation). GHG efficiency increases with the capacity factor; therefore, the calculated GHG efficiency of 916.01 lb CO_2 /MWh-HHV-gross demonstrates that the CCGT block can meet the 1000 lb CO_2/MWh-gross standard if AEC is operated at a higher capacity factor.

The SCGT block would not be able to comply with the 1000 pounds per gross megawatt-hours CO_2 emission limit. Therefore, the units are restricted to operate below the base load threshold. The SCGT block must comply with Subpart TTTT emission limit of 50 kg CO_2 per GJ of heat input (120 lb CO_2/MMBtu). Compliance with this standard is demonstrated by the exclusive use of natural gas as fuel.

Prevention of Significant Deterioration for Greenhouse Gases

SCAQMD Rule 1714 establishes preconstruction review requirements for GHGs. A PSD permit pursuant to Rule 1714 is required prior to construction of a new source or a major modification of an existing major source. The proposed changes to the operation schedule trigger a PSD review for NOx and PM10 and result in a GHG emission increase. Therefore, SCAQMD concluded a GHG PSD review is also required. The SCAQMD performed a PSD BACT analysis for GHGs and concluded thermal efficiency is the only technically and economically feasible alternative for CO_2/GHG emissions control. The current design proposed for the AEC continues to meet the BACT requirement for GHG emission reductions. The AEC conditions of certification include GHG emission limits. Staff is proposing to update **AQ-E9** and **AQ-E10** to include the recalculated CO_2 emission limits and subpart TTTT thermal efficiency limits for the CCGTs and SCGTs respectively. There are no proposed changes to sulfur hexafluoride emissions or requirements.

CONDITION CHANGES

Staff recommends the following changes to the Air Quality Conditions of Certification:

- Updating the table that maps CEC license conditions to SCAQMD permit conditions and summarizes the recommended changes.
- Updating the reference terminology from SCAQMD/District to South Coast AQMD.
- Documenting the previous deletion of **AQ-SC9**.
- Deleting condition **AQ-SC11**. This condition is no longer necessary since the CEC updated amendment procedures.
- Adding new condition **AQ-SC12** to ensure best management practices are incorporated during the construction of the SCGTs.
- Updating the equipment description for the CCGT stack height and ammonia tanks capacity.
- Updating the PM2.5 emission requirement to 100 tons per year in **AQ-F1.**
- Updating to the boiler retirement requirements in **AQ-F3** and **AQ-F5**.
- Clarifying the equipment covered under the SF6 requirements in **AQ-F6**.
- Adding new condition **AQ-F7** to clarify general requirements and provide breakdown coverage for monitoring systems that are not subject to SCAQMD Rule 218.
- Adding of new language in **AQ-A1** and **AQ-A2** requiring the use of a certified CO CEMS.
- Including separate PM2.5 requirements in **AQ-A1** and **AQ-A2**.

- Updating the annual emission limits for the CCGTs in **AQ-A1**.
- Updating the annual emission limits for the SCGTs in **AQ-A2**.
- Updating the CCGTs NOx emission rate in **AQ-A5** used to calculate emissions between commissioning and CEMs certification.
- Increasing the non-cold startup NOx emission limit for the CCGTs in **AQ-C1.**
- Lowering the minimum ammonia injection rate in **AQ-D1** from 44 pounds per hour to 20 pounds per hour.
- Modifying the effective temperature range of the SCR/CO catalyst **AQ-D2** from 570 to 692°F to 450 to 800°F.
- Clarifying the ammonia source test frequency in **AQ-D12**.
- Updating the construction date in **AQ-E2** for the SCGTs.
- Updating the CO_2 emission limits and subpart TTTT thermal efficiency limits for the CCGTs in **AQ-E9**.
- Updating the CO_2 emission limits and subpart TTTT thermal efficiency limits for the SCGTs in **AQ-E10**.
- Updating the equipment applicability in **AQ-E14** to only Phase 2 equipment for the required BACT/LAER determination prior to the construction of the SCGTs and updating the condition table accordingly.
- Adding new condition **AQ-E15** requiring a Rule 1325 compliance review prior to construction of the SCGTs.
- Updating the RECLAIM holdings required for the CCGTs in **AQ-I1.**
- Updating the RECLAIM holdings required for the SCGTs in **AQ-I2**.

CONCLUSIONS

Air quality impacts from: (1) increasing the annual hours of operation for the CCGTs, (2) decreasing the annual hours of operation for the SCGTs, (3) increasing the allowable non-cold startup nitrogen oxide emission limit, (4) increasing the CCGTs exhaust stack heights from 140 to 150 feet, (5) updating the dimensions and capacity of the ammonia tank,(6) updating the exhaust temperature range of the inlet of the selective catalytic reduction and carbon monoxide catalyst beds, (7) updating the ammonia injection range of the elective catalytic reduction catalyst, (8) revising the carbon monoxide emission monitoring requirements, and (9) revising the Alamitos Generating Station Boiler Retirement Plan, are all considered less than significant with the adoption of the recommended mitigation.

The proposed project changes would result in an increase to the CCGT monthly potential nitrogen oxide emissions and annual potential emissions of nitrogen oxide, carbon monoxide, volatile organic compounds, particulate matter less than 10 and 2.5 microns in size, and oxides of sulfur. The SCGT annual potential emissions would decrease for nitrogen oxide, carbon monoxide, volatile organic compounds, particulate matter less than 10 and 2.5 microns in size, and oxides of sulfur. Overall, AEC emissions

would increase for nitrogen oxide, carbon monoxide, volatile organic compounds, and oxides of sulfur. There would be no potential change to potential annual particulate matter less than 10 and 2.5 microns in size emissions. In addition, the proposed changes potentially increase natural gas combusted by the project equipment.

The proposed changes were analyzed for consistency with all LORS including the SCAQMD and federal new source review regulations. An impact analysis was performed to assess the proposed emission increases. The modeling results indicate potential impacts from the proposed changes would not cause a significant impact. AES would be required to hold additional Regional Clean Air Incentives Market Trading Credits to mitigate the monthly increase in nitrogen oxide emissions. AES is currently in compliance with all SCAQMD requirements for the use of the SCAQMD internal offset account for offsetting the CCGT and SCGT emissions of volatile organic compounds, particulate matter less than 10 microns, and oxides of sulfur. The SCAQMD internal offset program continues to meet CEC mitigation requirements for the proposed annual emission increases. The AEC facility would still meet all greenhouse gas emissions performance standards. Greenhouse gas emissions from the AEC would still be below the already retired AGS units. The proposed updates to the conditions of certification would ensure compliance with all LORS.

With the adoption of the proposed mitigation, all proposed changes would conform with the applicable LORS related to air quality and would not result in significant air quality impacts to any environmental population including minority or low-income populations. The requested changes have already been analyzed by SCAQMD staff and incorporated into the SCAQMD issued Title V permit.

AMENDED CONDITIONS OF CERTIFICATION

The modifications to the Air Quality Conditions of Certification are included below. **Bold underline** indicates new language. ~~Strikethrough~~ indicates deleted language.

The SCAQMD has a unique structuring and numbering for their permit conditions. In order for the reader to avoid confusion between the SCAQMD numbering and Energy Commission numbering, a table is included below that cross references the conditions in the SCAQMD permit to the conditions in the license and subsequent amendments as proposed. Note that the conditions are also grouped under the equipment they apply to, so they are not listed below in a consecutive sequence in the table.

SOUTH COAST AQMD PERMIT CONDITIONS WITH CORRESPONDING CEC CONDITIONS OF CERTIFICATION

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
Facility Conditions		
F2.1	**AQ-F1**	Annual emission limit for PM2.5. Includes equation and emission factors. Semi-annual Title V report shall include monthly compliance demonstrations.

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
F9.1	**AQ-F2**	Exhaust opacity limits.
F18.1	**AQ-F3**	Acid Rain SO_2 allocations for existing boilers.
F24.1	**AQ-F4**	Accidental release prevention requirements. (existing)
F52.1	**AQ-F5**	Requires a retirement plan for the permanent shutdown of the existing boilers #1, 2, 3 and 6.
F52.2	**AQ-F6**	Provides specifications for SF6 circuit breakers including a maximum leakage rate of 0.5 percent by weight. Requires circuit breakers to include a 10% by weight leak detections system. Leakage shall be calculated on an annual basis.
F67.1	**AQ-F7**	**Clarifies monitoring requirements for monitoring systems not subject to SAQMD Rule 218 requirements.**
Combined-Cycle Gas Turbine Generators		
A63.2	**AQ-A1**	Monthly and annual contaminant emission limits (CO, VOC, PM10, **PM2.5**, & SOx). Includes emissions calculations equations and emission factors for commissioning and normal operation.
A99.1	**AQ-A4**	Establishes a NOx emission factor (16.66 lbs/mmscf) during the commissioning period for RECLAIM reporting. Records of natural gas are required for compliance.
A99.2	**AQ-A5**	Establishes a NOx emission factor (~~8.35~~ **8.79** lbs/mmscf) during the interim period after commissioning but prior to CEMS certification. Records of natural gas are required for compliance.
A195.8	**AQ-A9**	NOx emission limit of 2.0 ppm @ 15% O_2 averaged over 1-hour. Does not apply during commissioning, startup, and shut down periods.
A195.9	**AQ-A12**	CO emission limit of 1.5 ppm @ 15% O_2 averaged over 1-hour. Does not apply during commissioning, startup, and shut down periods.
A195.10	**AQ-A15**	VOC emission limit of 2.0 ppm @ 15% O_2 averaged over 1-hour. Does not apply during commissioning, startup, and shut down periods.
A327.1	**AQ-A18**	Relief from emission limits, under Rule 475; project may violate either the mass emission limit or concentration emission limit, but not both at the same time.
B61.1	**AQ-B1**	Annual H_2S concentration limit of 0.25 grains/100 scf for natural gas.
C1.3	**AQ-C1**	Limits start-ups to 2 per day, 62 total per month (15 cold), and annually (80 cold, 500 total). Defines cold

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
		and non-cold startups and establishes duration and emission limits.
C1.4	**AQ-C2**	Limits shutdowns to 62 total per month and 500 annually. Limits shutdown events to 30 minutes and establishes emission limits.
D29.2	**AQ-D10**	Requires initial source tests for NOx, CO, SOx, VOC, PM10, PM2.5 and NH_3. Establishes testing methods and protocol requirements.
D29.3	**AQ-D11**	Requires source tests for specific pollutants (SOx, VOC, and PM/PM10) once every three years. Establishes testing method and reporting requirements.
D82.1	**AQ-D15**	Requires the installation of CEMS for CO emissions.
D82.2	**AQ-D16**	Requires the installation of CEMS for NOx emissions.
~~E74.1~~	~~**AQ-E14**~~	~~Requires the BACT/LAER determination to be reviewed prior to the commencement of Phase II construction (simple-cycle).~~
E193.4	**AQ-E1**	Requires that the turbines are constructed, operated and maintained according to the mitigation measures stipulated in the Commission Decision.
E193.5	**AQ-E2**	The Permit to Construct expires one year from the date of issuance unless extended. Establishes construction timelines.
E193.8	**AQ-E3**	Limits commissioning to 996 hours for each turbine from the date of initial start-up. Only 216 of the 996 hours can be without emission control. The equipment shall only operate when vented to the CO oxidation catalyst and SCR system after commissioning.
E193.11	**AQ-E6**	Requires compliance with 40 CFR 60 Subpart TTTT. Establishes a 1,000 lb/MWhr (gross) CO_2 emission limit if the turbine supplies more than 1,481,141 MWh-net electrical output for distribution on a 12 operating month and 3 yr average.
E193.12	**AQ-E7**	Requires compliance with 40 CFR 60 Subpart TTTT. Limits CO_2 emissions to 120 lbs/MMBtu if the turbine supplies less than 1,481,141 MWh-net electrical output for distribution on a 12 operating month and 3yr average.
E193.14	**AQ-E9**	Limits CO_2 emissions to ~~610,480~~ **861,119** tons per year. Establishes a CO_2 emission rate of ~~937.88~~ **916.01** lbs/gross megawatt hour on an annual basis. Includes emission equation and emission factor.
E448.1	**AQ-E11**	Limits total electric output from all the generators to 1094.7 MW-gross at 59 degree Fahrenheit.

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
		Establishes electrical output monitoring requirements.
I297.1, I297.2	**AQ-I1**	Prohibited from operation unless the project owner hold**s** sufficient RTCs for the CTGs.
K40.4	**AQ-K1**	Source test reporting requirements.
Simple-Cycle Turbines		
A63.3	**AQ-A2**	Monthly and annual contaminant emission limits (CO, VOC, PM10, **PM2.5**, & SOx). Includes emissions calculations equations and emission factors for commissioning and normal operation.
A99.3	**AQ- A6**	Establishes a NOx emission factor (25.24 lbs/mmscf) during the commissioning period for RECLAIM reporting. Records of natural gas are required for compliance.
A99.4	**AQ- A7**	Establishes a NOx emission factor (11.21 lbs/mmscf) during the interim period after commissioning but prior to CEMS certification. Records of natural gas are required for compliance.
A195.11	**AQ-A10**	NOx emission limit of 2.5 ppm @ 15% O_2 averaged over 1-hour. Does not apply during commissioning startup, and shut down periods.
A195.17	**AQ-A13**	CO emission limit of 2.0 ppm @ 15% O_2 averaged over 1-hour. Does not apply during commissioning startup, and shut down periods.
A195.10	**AQ-A15**	VOC emission limit of 2.0 ppm @ 15% O_2 averaged over 1-hour. Does not apply during commissioning startup, and shut down periods.
A327.1	**AQ-A18**	Relief from emission limits, under Rule 475; project may violate either the mass emission limit or concentration emission limit, but not both at the same time.
B61.1	**AQ-B1**	Annual H_2S concentration limit of 0.25 grains/100 scf for natural gas.
C1.5	**AQ-C3**	Limits start-ups to 2 per day, 62 total per month, and 500 annually. Establishes duration and emission limits.
C1.6	**AQ-C4**	Limits shutdowns to 62 total per month and 500 annually. Limits shutdown events to 13 minutes and establishes emission limits.
D29.2	**AQ-D10**	Requires initial source tests for NOx, CO, SOx, VOC, PM10, PM2.5 and NH_3. Establishes testing methods and protocol requirements.
D29.3	**AQ-D11**	Requires source tests for specific pollutants (SOx, VOC, and PM/PM10) once every three years.

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
		Establishes testing method and reporting requirements.
D82.1	**AQ-D15**	Requires the installation of CEMS for CO emissions.
D82.2	**AQ-D16**	Requires the installation of CEMS for NOx emissions.
E74.1	**AQ-E14**	Requires the BACT/LAER determination to be reviewed prior to the commencement of Phase II construction (simple-cycle).
E74.2	**AQ-E15**	**Requires a determination of compliance with federal New Source Review for PM2.5 be reviewed prior to the commencement of Phase II construction (simple-cycle).**
E193.4	**AQ-E1**	Requires that the turbines are constructed, operated and maintained according to the mitigation measures stipulated in the Commission Decision.
E193.5	**AQ-E2**	The Permit to Construct expires one year from the date of issuance unless extended. Establishes construction timelines.
E193.9	**AQ-E4**	Limits commissioning to 280 hours for each turbine from the date of initial start-up. Only 4 of the 280 hours can be without emission control. The equipment shall only operate when vented to the CO oxidation catalyst and SCR system after commissioning.
E193.13	**AQ- E8**	Requires compliance with 40 CFR 60 Subpart TTTT. Limits CO_2 emissions to 120 lbs/MMBtu.
E193.15	**AQ- E10**	Limits CO_2 emissions to ~~120,765~~ **54,185** tons per year. Establishes a CO_2 emission limit of ~~1,356.03~~ **1,506.98** lbs/gross megawatt hour on an annual basis. Includes emission equation and emission factor.
E448.1	**AQ- E11**	Limits total electric output from all the generators to 1094.7 MW-gross at 59 degrees Fahrenheit. Establishes electrical output monitoring requirements.
I297.3-6	**AQ-I2**	Prohibited from operation unless the project owner holds sufficient RTCs for the simple **cycle** turbines.
K40.4	**AQ-K1**	Source test reporting requirements.
Auxiliary Boiler		
A63.4	**AQ-A3**	Monthly and annual contaminant emission limits (CO, VOC, PM10, & SOx). Includes emissions calculations equations and emission factors for commissioning and normal operation.
A99.5	**AQ-A8**	Establishes a NOx emission factor **of** ~~(~~38.46 lbs/mmscf~~)~~ **during the interim period prior to CEMS certification an a NOx emission factor of**

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
		104.20 lbs/mmscf during the commissioning period for RECLAIM reporting. Records of natural gas are required for compliance.
A195.13	**AQ-A11**	NOx emission limit of 5.0 ppm @ 3% O_2 averaged over 1-hour. Does not apply during commissioning startup, and shut down periods.
A195.14	**AQ-A14**	CO emission limit of 50.0 ppm @ 3% O_2 averaged over 1-hour. Does not apply during commissioning startup, and shut down periods.
C1.7	**AQ-C5**	Limits start-ups to 1 per day, 10 total per month (2 cold, 4 warm, 4 hot), and annually (24 cold, 48 warm and 48 hot). Defines cold, warm and hot starts and establishes duration and emission limits.
D29.5	**AQ-D13**	Requires initial source tests for NOx, CO, SOx, VOC, PM10, PM2.5 and NH_3. Establishes testing methods and protocol requirements.
D29.6	**AQ-D14**	Requires source test for ammonia emissions. Establishes testing method and reporting requirements.
D82.3	**AQ-D17**	Requires the installation of CEMS for NOx emissions and establishes requirements for CEMS plan.
D82.4	**AQ-D18**	Established CO CEMS requirements for the auxiliary boiler.
~~E74.1~~	~~**AQ-E14**~~	~~Requires the BACT/LAER determination to be reviewed prior to the commencement of Phase II construction (simple-cycle).~~
E74.2	**AQ-E15**	**Requires a review of compliance with Rule 1325 (Federal New Source Review for PM2.5) prior to the commencement of Phase II construction (simple-cycle).**
E193.4	**AQ-E1**	Requires that the equipment is constructed, operated and maintained according to the mitigation measures stipulated in the Commission Decision.
E193.5	**AQ-E2**	The Permit to Construct expires one year from the date of issuance unless extended. Establishes construction timelines.
E193.10	**AQ-E5**	Limits commissioning to 30 hours from the date of initial start-up. The equipment shall only operate when vented to the SCR system after commissioning.
H23.7	**AQ-H1**	Establishes CO requirements according to Rule 1146.
I297.7	**AQ-I3**	Prohibited from operation unless the project owner hold sufficient RTCs for the boiler.
K40.5	**AQ-K2**	Source test reporting requirements.
SCR/CO Catalyst for Combined-cycle		

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
A195.15	**AQ-A16**	Establishes the 5.0 ppm ammonia slip limit. Requires a NOx analyzer.
D12.9	**AQ-D1**	Requires a flow meter for the ammonia injection and maintain continuous record. Requires ammonia injection between ~~44~~ **20** and 242 pounds per hour.
D12.10	**AQ-D2**	Requires a temperature gauge at the SCR inlet and maintain continuous record. Requires temperature be maintained between ~~570~~ **450** and ~~692~~ **800** degree Fahrenheit.
D12.11	**AQ-D3**	Requires a pressure gauge to measure the differential pressure across the SCR grid and maintain continuous record. Limits the pressure differential to 1.6 inches water column.
D29.4	**AQ-D12**	Requires initial, quarterly **source tests for NH_3** for the first year~~, and then~~**. Allows for continued** annual source tests for NH_3. Establishes testing methods and protocol requirements.
~~E74.1~~	~~**AQ-E14**~~	~~Requires the BACT/LAER determination to be reviewed prior to the commencement of Phase II construction (simple cycle).~~
E193.4	**AQ-E1**	Requires that the equipment is constructed, operated and maintained according to the mitigation measures stipulated in the Commission Decision.
E193.5	**AQ-E2**	The Permit to Construct expires one year from the date of issuance unless extended. Establishes construction timelines.
SCR/CO Catalyst for Simple		
A195.15	**AQ-A16**	Establishes the 5.0 ppm ammonia slip limit. Requires a NOx analyzer.
D12.12	**AQ-D4**	Requires a flow meter for the ammonia injection and maintain continuous record. Requires ammonia injection between 110 and 180 pounds per hour.
D12.13	**AQ-D5**	Requires a temperature gauge at the SCR inlet and maintain continuous record. Requires temperature be maintained between 500 and 870 degrees Fahrenheit.
D12.14	**AQ-D6**	Requires a pressure gauge to measure the differential pressure across the SCR grid and maintain continuous record. Limits the pressure differential to 3.0 inches water column.
D29.4	**AQ-D12**	Requires initial, quarterly for the first year, and then annual source tests for NH_3. Establishes testing methods and protocol requirements.

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
E74.1	**AQ-E14**	Requires the BACT/LAER determination to be reviewed prior to the commencement of Phase II construction (simple-cycle).
E193.4	**AQ-E1**	Requires that the equipment is constructed, operated and maintained according to the mitigation measures stipulated in the Commission Decision.
E193.5	**AQ-E2**	The Permit to Construct expires one year from the date of issuance unless extended. Establishes construction timelines.
SCR for the Auxiliary Boiler		
A195.16	**AQ-A17**	Establishes the 5.0 ppm ammonia slip limit. Requires a NOx analyzer.
D12.15	**AQ-D7**	Requires a flow meter for the ammonia injection and maintain continuous record. Requires ammonia injection between 0.3 and 1.1 pounds per hour.
D12.16	**AQ-D8**	Requires a temperature gauge at the SCR inlet and maintain continuous record. Requires temperature be maintained between 415 and 628 degrees Fahrenheit.
D12.17	**AQ-D9**	Requires a pressure gauge to measure the differential pressure across the SCR grid and maintain continuous record. Limits the pressure differential to 2.0 inches water column.
D29.4	**AQ-D12**	Requires initial, quarterly for the first year, and then annual source tests for NH_3. Establishes testing methods and protocol requirements.
~~E74.1~~	~~**AQ-E14**~~	~~Requires the BACT/LAER determination to be reviewed prior to the commencement of Phase II construction (simple-cycle).~~
E193.4	**AQ-E1**	Requires that the equipment is constructed, operated and maintained according to the mitigation measures stipulated in the Commission Decision.
E193.5	**AQ-E2**	The Permit to Construct expires one year from the date of issuance unless extended. Establishes construction timelines.
Ammonia Storage Tanks		
C157.1	**AQ-C6**	Requires the installation of a pressure relief valve maintained at 50 psig.
E74.1	**AQ-E14**	Requires the BACT/LAER determination to be reviewed prior to the commencement of Phase II construction (simple-cycle).
E144.1	**AQ-E12**	Requires venting of the storage tank during filling only to the vessel from which it is being filled.

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
E193.4	**AQ-E1**	Requires that the ammonia storage tank be operated according to the mitigation measures stipulated in the Commission Decision.
E193.5	**AQ-E2**	The Permit to Construct expires one year from the date of issuance unless extended. Establishes construction timelines.
Oil Water Separator		
E74.1	**AQ-E14**	Requires the BACT/LAER determination to be reviewed prior to the commencement of Phase II construction (simple-cycle).
E193.16	**AQ-E13**	Requires that the oil water separator be equipped with a fixed cover to minimize VOC emissions.
E193.4	**AQ-E1**	Requires that the oil water separator be operated according to the mitigation measures stipulated in the Commission Decision.
E193.5	**AQ-E2**	The Permit to Construct expires one year from the date of issuance unless extended. Establishes construction timelines.

STAFF CONDITONS

AQ-SC1 Air Quality Construction/Demolition Mitigation Manager (AQCMM): The project owner shall designate and have on-site AQCMM during construction/demolition activities an AQCMM who shall be responsible for directing and documenting compliance with **AQ-SC3**, **AQ-SC4,** and **AQ-SC5** for the entire project site and linear facility construction/demolition. The project owner may elect to assign one or more alternate AQCMM as well. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction/demolition activities as warranted by applicable construction/demolition mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition.

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the first on-site AQCMM to be assigned and all AQCMM Delegates. The AQCMM and all Delegates must be approved by the CPM before the start of ground disturbance. An AQCMM could be replaces after ground disturbance if the replacement AQCMM has been approved by the CPM.

AQ-SC2 Air Quality Construction/Demolition Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will

be taken and the reporting requirements necessary to ensure compliance with AQ-SC3, AQ-SC4, and AQ-SC5.

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM and the South Coast Air Quality Management District (~~District~~ **AQMD**). The District will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt. The AQC**M**P must be approved by the CPM before the start of ground disturbance.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report (MCR) that demonstrates compliance with the following mitigation measures for the purposes of minimizing fugitive dust emissions created from construction activities and preventing all fugitive dust plumes from leaving the project site and linear facility routes. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a. All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust mitigation objectives of Condition of Certification **AQ-SC4**. The frequency of watering can be reduced or eliminated during periods of precipitation.

b. No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

c. Visible speed limit signs shall be posted at the construction site entrances.

d. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

e. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

f. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

g. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

h. Construction areas adjacent to any paved roadway shall be provided with sandbags or other similar measures as specified in the Storm Water Pollution Prevention Plan (SWPP) to prevent run-off to roadways.

i. All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when

construction activity occurs to prevent the accumulation of dirt and debris.

j. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public roadways.

k. All soil storage piles and disturbed areas that remain inactive for longer than ten days shall be covered, or shall be treated with appropriate dust suppressant compounds.

l. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be covered, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least two feet of freeboard.

m. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

n. Disturbed areas will be re-vegetated as soon as practical.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report (MCR) to include:

1. A summary of all actions taken to maintain compliance with this condition;
2. Copies of any complaints filed with the ~~District~~ **South Coast AQMD** in relation to project construction; and
3. Any other documentation deemed necessary by the CPM, ~~District~~ **South Coast AQMD** or AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported**:** (1) off the project site**,** (2) 200 feet beyond the centerline of the construction of linear facilities**,** or (3) within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMM shall provide the CPM a MCR to include:

1. A summary of all actions taken to maintain compliance with this condition;
2. Copies of any complaints filed with the ~~District~~ **South Coast AQMD** in relation to project construction; and
3. Any other documentation deemed necessary by the CPM or AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the MCR, a construction mitigation report that demonstrates compliance with the following mitigation measures for purposes of controlling diesel construction-related emissions. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

A. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

B. All construction diesel engines with a rating of 50 hp or higher shall meet, at a minimum, the Tier 4 or 4i California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. This good faith effort shall be documented with signed written correspondence by the appropriate construction contractors along with documented correspondence with at least two construction equipment rental firms. In the event that a Tier 4 or 4i engine is not available for any

off-road equipment larger than 50 hp, that equipment shall be equipped with a Tier 3 engine, or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 3 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is "not practical" for the following, as well as other, reasons.

1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question to Tier 3 equivalent emission levels and the highest level of available control using retrofit or Tier 2 engines is being used for the engine in question; or
2. The construction equipment is intended to be on site for 10 working days or less.
3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not practical.

C. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and that a replacement for the equipment item in question meeting the controls required in item "B" occurs within 10 days of termination of the use, if the equipment would be needed to continue working at this site for more than 15 days after the use of the retrofit control device is terminated, if one of the following conditions exists :

1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.
2. The retrofit control device is causing or is reasonably expected to cause engine damage.
3. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.
4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

D. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (B) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

E. All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

F. Construction equipment will employ electric motors when feasible.

Verification: The AQCMM shall include in a table in the MCR the following to demonstrate control of diesel construction-related emissions:

1. A summary of all actions taken to maintain compliance with this condition,
2. A list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained, and
3. Any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner shall provide the CPM copies of any ~~District~~ **South Coast AQMD** -issued project air permit for the facility. The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the ~~District~~ **South Coast AQMD** or U.S. EPA, and any revised permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any project air permit and any proposed air permit modification to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC7 The project owner shall submit to the CPM Quarterly Operation Reports, following the end of each calendar quarter that include operational and emissions information as necessary to demonstrate compliance with the Conditions of Certification herein. The Quarterly Operation Report will specifically state that the facility meets all applicable Conditions of Certification or note or highlight all incidences of noncompliance.

Verification: The project owner shall submit the Quarterly Operation Reports to the CPM and ~~District~~ **South Coast AQMD**, if requested by the ~~District~~ **South Coast AQMD** t, no later than 30 days following the end of each calendar quarter.

AQ-SC8 The project owner shall provide mitigation in the form of offsets or emission reduction credits (ERCs) in the quantities of at least 4.08 lbs/day of VOC,1.27 lbs per day of SOx, and 4.54 lbs/day of PM10 emissions for the auxiliary boiler and 1 lb/day of VOC emissions for the oil/water separators. The project owner shall demonstrate that the reductions are provided in the form required by the ~~District~~ **South Coast AQMD**.

The project owner shall provide an ERC list and surrender the ERCs as required by the ~~District~~ **South Coast AQMD**. The project owner shall request CPM approval for any substitutions, modifications, or additions to the ERCs.

The CPM, in consultation with the ~~District~~ **South Coast AQMD**, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards, and that the requested change(s) will not cause the project to result in a significant environmental impact. The ~~District~~ **South Coast AQMD** must also confirm that each requested change is consistent with applicable federal and state laws and regulations.

Verification: The project owner shall submit any project air permit and any proposed air permit modification to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt, including records showing that the project's offset requirements have been met prior to initiating construction. If the CPM approves a substitution or modification to the list of ERCs, the CPM shall file a statement of the approval with the project owner and Energy Commission docket. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC9 Deleted

AQ-SC10 The project owner shall complete the combined-cycle turbine (CCGT-1 and CCGT-2) commissioning prior to the commissioning of the simple-cycle gas turbines (SCGT-1, SCGT-2, SCGT-3 and SCGT-4).

Verification: The project owner shall identify the start and conclusion of the work phases described above in the Monthly Compliance Reports and/or Quarterly Operational reports.

AQ-SC11 Deleted ~~The project owner shall comply with all staff (AQ-SC) and District (AQ) Conditions of Certification. The CPM, in consultation with the District, may approve any change to a Condition of Certification regarding air quality, as a staff approved modification, provided that: (1) the Project remains in compliance with all applicable laws, ordinances, regulations, and standards, (2) the requested change clearly will not cause the Project to result in a significant environmental impact, (3) no additional mitigation or offsets will be required as a result of the change, (4) no existing daily, quarterly, or annual permit limit will be exceeded as a result of the change, and (5) no increase in any daily, quarterly, or annual permit limit will be necessary as a result of the change.~~

~~**Verification:** The project owner shall submit a petition to amend for any proposed change to a condition of certification pursuant to this condition and shall provide the CPM with any additional information the CPM requests to substantiate the basis for approval.~~

AQ-SC12 At least 60 days prior to the construction of any simple-cycle gas turbines (SCGT-1, SCGT-2, SCGT-3 and SCGT-4), the project owner shall submit an updated AQCMP as required in AQ-SC2 outlining any changes to PM2.5 best management practices to the CPM.

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM and the South Coast Air Quality Management District (AQMD). The District will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt. The AQCMP must be approved by the CPM before the start of ground disturbance.

SOUTH COAST AQMD PERMITTED EQUIPMENT AND CONDITIONS

Equipment

ID No.	Equipment Descriptions
AEC CCGT Power Block	
Combined-Cycle Gas Turbine 1 (CCGT-1)	
D165	CCGT-1 General Electric Model 7FA.05, natural gas combined-cycle, 236.645 MW at 28 degrees Fahrenheit, with a Heat Recovery Steam Generator and 219.615 MW Steam Turbine Generator (common with HRSG CCGT-2)
C169	CCGT-1 CO Oxidation Catalyst
C170	CCGT-1 Selective Catalytic Reduction with aqueous ammonia
S172	CCGT-1 Turbine Stack, height of ~~140~~ **150** feet and diameter of 20 feet
Combined-Cycle Gas Turbine 2 (CCGT-2)	
D173	CCGT-2 General Electric Model 7FA.05, natural gas combined-cycle, 236.645 MW at 28 degrees Fahrenheit, with a Heat Recovery Steam Generator and 219.615 MW Steam Turbine Generator (common with HRSG CCGT-1)
C177	CCGT-2 CO Oxidation Catalyst
C178	CCGT-2 Selective Catalytic Reduction with aqueous ammonia
S180	CCGT-2 Turbine Stack, height of ~~140~~ **150** feet and diameter of 20 feet
Auxiliary Boiler	
D181	70.8 MMBtu/hr Cleaver Brooks Model-NB-200D-50 natural gas boiler
C183	Auxiliary Boiler Selective Catalytic Reduction with aqueous ammonia
S211	Auxiliary Boiler Stack, height of 80 feet and diameter of 3 feet
AEC SCGT Power Block	
Simple-Cycle Gas Turbine 1 (SCGT-1)	
D185	SCGT-1 General Electric Model LMS-100PB, natural gas simple-cycle, 100.438 MW at 59 degrees Fahrenheit
C187	SCGT-1 CO Oxidation Catalyst
C188	SCGT-1 Selective Catalytic Reduction with aqueous ammonia
S180	SCGT-1 Turbine Stack, height of 80 feet and diameter of 13.5 feet
Simple-Cycle Gas Turbine 2 (SCGT-2)	
D191	SCGT-2 General Electric Model LMS-100PB, natural gas simple-cycle, 100.438 MW at 59 degrees Fahrenheit
C193	SCGT-2 CO Oxidation Catalyst
C194	SCGT-2 Selective Catalytic Reduction with aqueous ammonia
S196	SCGT-2 Turbine Stack, height of 80 feet and diameter of 13.5 feet

Simple-Cycle Gas Turbine 3 (SCGT-3)	
D197	SCGT-3 General Electric Model LMS-100PB, natural gas simple-cycle, 100.438 MW at 59 degrees Fahrenheit
C199	SCGT-3 CO Oxidation Catalyst
C200	SCGT-3 Selective Catalytic Reduction with aqueous ammonia
S202	SCGT-3 Turbine Stack, height of 80 feet and diameter of 13.5 feet
Simple-Cycle Gas Turbine 4 (SCGT-4)	
D203	SCGT-4 General Electric Model LMS-100PB, natural gas simple-cycle, 100.438 MW at 59 degrees Fahrenheit
C205	SCGT-4 CO Oxidation Catalyst
C206	SCGT-4 Selective Catalytic Reduction with aqueous ammonia
S208	SCGT-4 Turbine Stack, height of 80 feet and diameter of 13.5 feet
Supporting Equipment	
Oil/Water Separation	
D209	OWS-1 Storage Tank, 5,000 gallon serving CCGT
D210	OWS-2 Storage Tank, 5,000 gallon serving SCGT
Inorganic Chemical Storage	
D163	Tank-1 Storage Tank ~~40,000~~ **22,290** gallons serving the CCGT
D164	Tank-2 Storage Tank 40,000 gallons serving the SCGT

South Coast Air Quality Management District Conditions of Certification

The following South Coast AQMD conditions AQ-F1 to AQ-F6 are facility wide conditions that apply to each unit of equipment and the AEC facility as a whole.

AQ-F1 The project owner shall limit emissions from this facility as follows:

CONTAMINANT	EMISSIONS LIMIT
PM 2.5	Less than ~~70~~ **100** tons in any one year

The project owner shall not operate any of the Boilers Nos. 1, 2, 3, 4, 5, 6 (Devices D39, D42, D45, D48, D51, D3, respectively), Combined-Cycle Turbines Nos. CCGT-1 and CCGT-2 **(**Devices D165 and D173, respectively), Auxiliary Boiler (Device D181), or Simple-Cycle Turbines Nos. SCGT-1, SCGT-2, SCGT-3, and SCGT-4 (Devices D185, D191, D197, and D203 respectively) unless compliance with the annual emission limit for PM2.5 is demonstrated.

Compliance with the annual emission limit shall be based on a 12-month rolling average basis. The project owner shall calculate the PM2.5 emissions for the facility by summing the PM2.5 emissions for each of the sources by using the equation below.

Facility PM2.5, tons/year = (FF1*EF1 + FF2*EF2 + FF3*EF3 + FF4*EF4 + FF5*EF5 + FF6*EF6 + FF7*EF7 + FF8*EF8 + FF9*EF9 + FF10*EF10 + FF11*EF11+ FF12*EF12 + FF13*EF13)/2000

Equipment Monthly Fuel Usage (mmscf))	Emission Factor (lb/mmscf)
Existing Boilers	
FF1 = Boiler No. 1	EF1 = 1.19
FF2 = Boiler No. 2	EF2 = 1.19
FF3 = Boiler No. 3	EF3 = 1.19
FF4 = Boiler No. 4	EF4 = 1.19
FF5 = Boiler No. 5	EF5 = 1.19
FF6 = Boiler No. 6	EF6 = 1.19
Combined-Cycle Turbines	
FF7 = No. CCGT-1	EF7 = 3.92
FF8 = No. CCGT-2	EF8 = 3.92
Auxiliary Boiler	
FF9 = Auxiliary Boiler	EF9 = 7.42
Simple-Cycle Turbines	
FF10 = Turbine No. SCGT-1	EF10 = 7.44
FF11 = Turbine No. SCGT-2	EF11 = 7.44
FF12 = Turbine No. SCGT-3	EF12 = 7.44
FF13 = Turbine No. SCGT-4	EF13 = 7.44

Any changes to these emission factors must be approved in advance by the South Coast AQMD in writing and be based on unit specific source tests performed using South Coast AQMD -approved testing protocol.

AES Alamitos, LLC shall submit written reports of the monthly PM2.5 compliance demonstration required by this condition. The report submittal shall be included with the semi-annual Title V report as required under Rule 3004(a)(4)(f). Records of the monthly PM2.5 compliance demonstration shall be maintained on site for at least five years and made available upon South Coast AQMD request.

For the purpose of this condition, any one year shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12-month period beginning on the first day of each calendar month.

[Rule 1325]

Verification: The project owner shall submit to the CPM the facility annual operating and emissions data demonstrating compliance with this condition as part of the fourth quarter Quarterly Operation Report (**AQ-SC7**).

AQ-F2 Except for open abrasive blasting operations, the project owner shall not discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is:

A. As dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines; or

B. Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subparagraph (a) of this condition.

[RULE 401]

Verification: The project owner shall make the site available for inspection by representatives of the ~~District~~ **South Coast AQMD**, California Air Resources Board (ARB), the United States Environmental Protection Agency (U.S. EPA) and the California Energy Commission (Energy Commission).

AQ-F3 Acid Rain SO_2 Allowance Allocations for affected units are as follows:

Device ID	Boiler ID	Contaminant	Tons in any year
39	Unit 1	SO_2	2,703
42	Unit 2	SO_2	17
45	Unit 3	SO_2	81
48	Unit 4	SO_2	541
51	Unit 5	SO_2	3,866
3	Unit 6	SO_2	936

A. The allowance allocations shall apply to calendar years 2010 and beyond.

B. The number of allowances allocated to Phase II affected units by U.S. EPA may change in a 1998 revision to 40 CFR 73 Tables 2, 3 and 4. In addition, the number of allowances actually held by an affected source in a unit account may differ from the number allocated by U.S. EPA. Neither of the aforementioned conditions necessitate a revision to the unit SO_2 allowance allocation identified in this permit (see 40 CFR 72.84)

Additional requirements for retire units (Unit 1, Unit 2, and Unit 6):

C. A unit exempted under 40 CFR 72.8 shall not emit any sulfur dioxide starting on the date it is exempted.

D. For a unit exempted under 40 40 CFR 72.8, the project owner shall comply with monitoring requirements in accordance with part 75 and will be allocated allowcated allowances in accordance with 40 CFR 73.

E. A unit exempted under 40 CFR 73 shall not resume operation unless the project owner submits an Acid Rain permit application for the unit not less than 24 months prior to the later of January 1, 2000, or the date the unit is to resume operation. On the earlier of the date, the written exemption expires or the date an Acid Rain permit application is submitted or is required to be submitted under this paragraph, th unit shall no longer be exempted and shall be subject to all requirements of 40 CFR 72.

[40 CFR 73 Subpart B]

Verification: The project owner shall submit to the CPM the statement certifying compliance with this condition as part of the fourth quarter Quarterly Operation Report (**AQ-SC7**).

AQ-F4 Accidental release prevention requirements of Section 112(r)(7):

A. The project owner shall comply with the accidental release prevention requirements pursuant to 40 CFR Part 68 and shall submit to the Executive Officer, as a part of an annual compliance certification, a statement that certifies compliance with all of the requirements of 40 CFR Part 68, including the registration and submission of a risk management plan (RMP).

B. The project owner shall submit any additional relevant information requested by the Executive Officer or designated agency.

[RULE 40 CFR 68 – Accidental Release Prevention, 5-24-1996].

Note: This condition is applicable to the four existing ammonia tanks (Devices D19, D151, D152, and D153) in Section D, because they are permitted to contain 29% aqueous ammonia. This condition is not applicable to the two new ammonia tanks (Devices D163, D164) installed for the AEC project because they are permitted to contain 19% ammonia. Ongoing compliance with this condition will not be required after the four existing tanks are removed from the facility.

Verification: The project owner shall submit to the CPM the statement certifying compliance with this condition as part of the fourth quarter Quarterly Operation Report (**AQ-SC7**).

AQ-F5 To utilize ~~SCAQMD~~ **South Coast AQMD** Rule 1304, the project owner shall perform the following as set forth in ~~SCAQMD~~ **South Coast AQMD** permit condition F52.1:

The facility shall submit a detailed retirement plan for the permanent shutdown of Boilers Nos. 1, 2, 6 and 3 (Devices D39, D42, D3, and D45, respectively), describing in detail the steps and schedule that will be taken to render Boilers Nos. 1, 2, 6, and 3 permanently inoperable.

The retirement plan shall be submitted to ~~SCAQMD~~ **South Coast AQMD** within 60 days after Permits to Construct for Combined-Cycle Turbines Nos. CCGT-1 and CCGT-2 **(**Devices D165 and D173, respectively), common Steam Turbine Generator, and Simple-Cycle Turbines Nos. SCGT-1, SCGT-2, SCGT-3, and SCGT-4 (Devices D185, D191, D197, and D203 respectively) are issued.

AES shall not commence any construction of the Alamitos Energy Project including Gas Turbines Nos. CCGT-1, CCGT-2, SCGT-1, SCGT-2, SCGT-3, and SCGT-4, unless the retirement plan is approved in writing by ~~SCAQMD~~ **South Coast AQMD**. If ~~SCAQMD~~ **South Coast AQMD** notifies AES that the plan is not approvable, AES shall submit a revised plan addressing ~~SCAQMD~~ **South Coast AQMD**'s concerns within 30 days.

Within 30 calendar days of actual shutdown but no later than ~~December 29, 2019~~ **January 10, 2020**, AES shall provide ~~SCAQMD~~ **South Coast AQMD** with a notarized statement that Boilers Nos. 1, 2, and 6 are permanently shut down and that any re-start or operation of the boilers shall require new

Permits to Construct and be subject to all requirements of Nonattainment New Source Review and the Prevention Of Significant Deterioration Program.

AES shall notify ~~SCAQMD~~ **South Coast AQMD** 30 days prior to the implementation of the approved retirement plan for permanent shutdown of Boilers Nos. 1, 2, and 6, or advise ~~SCAQMD~~ **South Coast AQMD** as soon as practicable should AES undertake permanent shutdown prior to December ~~29~~ **31**, 2019.

AES shall cease operation of Boilers Nos. 1, 2, and 6 within 90 calendar days of the first fire of Gas Turbines No. CCGT-1 or CCGT-2, ~~or by December 29, 2019~~ whichever is earlier.

Within 30 calendar days of actual shutdown but no later than ~~December 31, 2020~~ **January 10, 2021 (unless the December 31, 2020 Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Once Through Cooling Policy) compliance date is extended by the State Water Resources Control Board (SWRCB))**, AES shall provide ~~SCAQMD~~ **South Coast AQMD** with a notarized statement that Boiler No. 3 is permanently shut down and that any re-start or operation of the boiler shall require a new Permit to Construct and be subject to all requirements of Nonattainment New Source Review and the Prevention Of Significant Deterioration Program.

In the event that the SWRCB extends the December 31, 2020 Once Through Cooling Policy compliance date for Boiler No. 3, the project owner shall: (1) Notify the South Coast AQMD within 3 months of the approval of an extension, and (2) within 30 calendar says of actual shutdown of Boiler No. 3, provide South coast AQMD with a notarized statement that Boiler No.3 is permanently shut down and that any re-start or operation of the boiler shall require a new Permit to Construct and be subject to all requirements of Nonattainment New Source Review and the Prevention of Significant Deterioration Program.

AES shall notify ~~SCAQMD~~ **South Coast AQMD** 30 days prior to the implementation of the approved retirement plan for permanent shutdown of Boiler No.3 or advise ~~SCAQMD~~ **South Coast AQMD** as soon as practicable should AES undertake permanent shutdown prior to December 31, 2020.

AES shall cease operation of Boiler No. 3 within 90 calendar days of the first fire of Gas Turbines No. SCGT-1, SCGT-2, SCGT-3, or SCGT-4, or by December 31, 2020, whichever is earliest.

[RULE 1304(a)—Modeling and Offset Exemption; RULE 1313(d)]

Verification: The project owner shall submit the retirement plan, and any modifications to the plan, to the CPM for approval within five working days of submittal to the ~~SCAQMD~~ **South Coast AQMD**. The project owner shall submit the written proof

of ~~SCAQMD~~ **South Coast AQMD** approval of the retirement plan or any modification to the retirement plan within five working days of obtaining ~~SCAQMD~~ **South Coast AQMD** written approval. The project owner shall submit to the CPM the notarized station that Boilers 1, 2, and 6 are permanently shut down within 30 days of actual shutdown but no later than December ~~29~~ **31**, 2019. The project owner shall submit to the CPM the notarized station that Boiler 3 is permanently shut down within 30 days of actual shutdown but no later than ~~December 31, 2020~~ **January 10, 2021**.

AQ-F6 The project owner is subject to the applicable **facility** requirements of the following rules or regulations(s):

Facility for this condition of certification is defined as the Alamitos Energy Center. The equipment includes Combined-Cycle Turbines Nos. CCGT-1 and CCGT-2; common Steam Turbine Generator; and Simple-Cycle Turbines Nos. SCGT-1, SCGT-2, SCGT-3, and SCGT-4.

For all circuit breakers at the facility utilizing SF6, including the circuit breakers serving Combined-Cycle Turbines Nos. CCGT-1 and CCGT-2; common Steam Turbine Generator; and Simple-Cycle Turbines Nos. SCGT-1, SCGT-2, SCGT-3, and SCGT-4, the project owner shall install, operate, and maintain enclosed-pressure SF6 circuit breakers with a maximum annual leakage rate of 0.5 percent by weight. The circuit breakers shall be equipped with a 10 percent by weight leak detection system.

The leak detection system shall be calibrated in accordance with manufacturer's specifications. The manufacturer's specifications and records of all calibrations shall be maintained on site.

The total CO_2e emissions from all circuit breakers shall not exceed 74.55 tons per calendar year.

The project owner shall calculate the SF6 emissions due to leakage from the circuit breakers by using the mass balance in equation DD-1 at 40 CFR Part 98, Subpart DD, on an annual basis.

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**.

[RULE 1714]

Verification: The project owner shall make the site available for inspection by representatives of the ~~District~~ **South Coast AQMD**, ARB, U.S. EPA and the Energy Commission.

AQ-F7 The project owner shall comply with the following:

Continuous operation of monitoring systems not subject to Rule 218 are not required when necessary calibration, maintenance, or repair

activities are performed in accordance with manufacturer's recommendation. The project owner shall take all reasonable actions to minimize the time required to perform such activities. In no event shall any such activities exceed 96 consecutive hours for any one calibration, maintenance, or repair episode.

The project owner shall notice the South Coast AQMD within 24 hours of the start of calibration, maintenance, or repair activity, if the activity is expectd to last more than 24 consecutive hours.

[RULE 204]

Verification: The project owner shall make the site and records available for inspection by representatives of the South Coast AQMD, California Air Resources Board (ARB), the United States Environmental Protection Agency (U.S. EPA) and the California Energy Commission (Energy Commission).

Device Conditions

Emission Limits:

AQ-A1 The project owner shall limit emissions from this equipment as follows:

Contaminant	Range	Emissions Limit
Monthly Pounds in Any Calendar Month (lbs/month)		
CO	Less than or equal to	95,023 lbs/month
VOC	Less than or equal to	13,314 lbs/month
PM10	Less than or equal to	6,324 lbs/month
PM2.5	**Less than or equal to**	**6,324 lbs/month**
SOx	Less than or equal to	3,616 lbs/month
Annual Pounds in Any One Year (lbs/year)		
CO	Less than or equal to	~~180,544~~ **194,717** ~~(~~lbs./year
VOC	Less than or equal to	~~52,668~~ **63,488** ~~(~~lbs./year~~)~~
PM10	Less than or equal to	~~39,440~~ **55,633** ~~(~~lbs./year~~)~~
PM2.5	**Less than or equal to**	**55,633 lbs/year**
SOx	Less than or equal to	~~7,435~~ **10,483** ~~(~~lbs./year~~)~~

For the purposes of this condition, the above emission limits shall be based on the emissions from a single turbine.

The turbine shall not commence with normal operation until the commissioning process has been completed. Normal operation commences when the turbine is able to supply electrical energy to the power grid as required under contract with the relevant entities. The ~~SCAQMD~~ **South Coast AQMD** shall be notified in writing once the commissioning process for each turbine is completed.

Normal operation may commence in the same calendar month as the completion of the commissioning process provided the turbine is in compliance with the above emission limits.

The project owner shall calculate the monthly emissions for CO, VOC, PM10, **PM2.5,** and SOx using the equation below.

Monthly Emissions, lb/month = (Monthly fuel usage in million standard cubic feet per month (mmscf/month)) * (Emission factors indicated below)

The following emission factors shall be used to demonstrate compliance with the monthly emission limits.

For commissioning, the emission factors shall be as follows: CO, 61.18 lb/mmscf; VOC, 8.86 lb/mmscf; PM10**/PM2.5**, 5.11 lb/mmscf; and SOx, 2.92 lb/mmscf.

For normal operation, the emission factors shall be as follows: ~~CO, 15.28 lb/mmscf~~; VOC, 4.70 lb/mmscf; PM10**/PM2.5**, 3.92 lb/mmscf; and SOx, 2.24 lb/mmscf.

For normal operation, the CO emissions shall be measured with the certified CO CEMS. For the interim period after commissioning but prior to CEMS certification and in the event of CEMS failure subsequent to CEMS certification, the emission factor shall be CO, 15.28 lb/mmcf.

For a month during which both commissioning and normal operation take place**,** the monthly emissions shall be the sum of the commissioning emissions and the normal operation emissions.

Compliance with the annual emission limits shall be based on a 12-operating month-rolling-average basis, following completion of the commissioning period.

The emission factors for the monthly emission limits shall be the same as the emission factors used to demonstrate compliance with the annual emission limits, except the annual emission factor for SOx is 0.75 lb/mmscf.

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**. The records shall include, but not be limited to, natural gas usage in a calendar month and automated monthly and annual calculated emissions.

[RULE 1303(a)(1)-BACT; RULE 1304.1, RULE 1703(a)(2) – PSD-BACT] [Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall provide emissions summary data in compliance with his condition as part of the Quarterly Operation reports (**AQ-SC7**).

AQ-A2 The project owner shall limit emissions from this equipment as follows:

Contaminant	Range	Emissions Limit
Monthly Pounds in Any Calendar Month (lbs/month)		
CO	Less than or equal to	8,594 **(**lbs/month**)**
VOC	Less than or equal to	1,973 **(**lbs/month**)**
PM10	Less than or equal to	4,638 **(**lbs/month**)**
PM2.5	**Less than or equal to**	**4,638 (lbs/month)**
SOx	Less than or equal to	1,207 **(**lbs/month**)**
Annual Pounds in Any One Year (lbs/year)		
CO	Less than or equal to	~~29,730~~ **24,543** ~~(lbs./year)~~
VOC	Less than or equal to	~~7,510~~ **4,533** ~~(lbs./year)~~
PM10	Less than or equal to	~~14,695~~ **6,596** ~~(lbs./year)~~
PM2.5	**Less than or equal to**	**6,596 lbs/year**
SOx	Less than or equal to	~~1,275~~ **573** ~~(lbs./year)~~

For the purposes of this condition, the above emission limits shall be based on the emissions from a single turbine.

The turbine shall not commence with normal operation until the commissioning process has been completed. Normal operation commences when the turbine is able to supply electrical energy to the power grid as required under contract with the relevant entities. The ~~SCAQMD~~ **South Coast AQMD** shall be notified in writing once the commissioning process for each turbine is completed.

Normal operation may commence in the same calendar month as the completion of the commissioning process provided the turbine is in compliance with the above emission limits.

The project owner shall calculate the monthly emissions for CO, VOC, PM10, **PM2.5,** and SOx using the equation below.

Monthly Emissions, lb/month =

(Monthly fuel usage in million standard cubic feet per month (mmscf/month)) * (Emission factors indicated below)

The following emission factors shall be used to demonstrate compliance with the monthly emission limits.

For commissioning, the emission factors shall be as follows: CO, 112.03 lb/mmscf; VOC, 3.69 lb/mmscf; PM10**/PM2.5**, 2.00 lb/mmscf; and SOx, 7.69 lb/mmscf.

For normal operation, the emission factors shall be as follows: ~~CO, 8.84 lb/mmscf~~; VOC, 3.17 lb/mmscf; PM10**/PM2.5**, 7.44 lb/mmscf; and SOx, 1.94 lb/mmscf.

For normal operation, the CO emissions shall be measured with the certified CO CEMS. For the interim period after commissioning but prior to the CEMS certification, and in the event of CO CEMS failure

subsequent to CO CEMS certification, the emission factor shall be CO, 8.84 lb/mmscf.

For a month during which both commissioning and normal operation take place the monthly emissions shall be the sum of the commissioning emissions and the normal operation emissions.

Compliance with the annual emission limits shall be based on a 12-operating month-rolling-average basis, following completion of the commissioning period.

The emission factors for the monthly emission limits shall be the same as the emission factors used to demonstrate compliance with the annual emission limits, except the annual emission factor for SOx is 0.65 lb/mmscf.

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**. The records shall include, but not be limited to, natural gas usage in a calendar month and automated monthly and annual calculated emissions.

[RULE 1303(a)(1)-BACT; RULE 1304.1, RULE 1703(a)(2) – PSD-BACT]
[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall provide emissions summary data in compliance with his condition as part of the Quarterly Operation reports (**AQ-SC7**).

AQ-A3 The project owner shall limit emissions from this equipment as follows:

Contaminant	Range	Emissions Limit
Monthly Pounds in Any Calendar Month (lbs/month)		
CO	Less than or equal to	605 lbs/month
VOC	Less than or equal to	102 lbs/month
PM10	Less than or equal to	113.5 lbs/month
PM2.5	Less than or equal to	113.5 lbs/month
SOx	Less than or equal to	32 lbs/month

The boiler shall not commence with normal operation until the commissioning process has been completed. The South Coast AQMD shall be notified in writing once the commissioning process for the boiler is completed.

Normal operation may commence in the same calendar month as the completion of the commissioning process provided the boiler is in compliance with the above emission limits.

The project owner shall calculate the monthly emissions for CO, VOC, PM10, and SOx using the equation below.

Monthly Emissions, lb/month = (Monthly fuel usage in mmscf/month) * (Emission factors indicated below)

The following emission factors shall be used to demonstrate compliance with the monthly emission limits.

For commissioning, the emission factors shall be as follows: CO, 107.16 lb/mmcf; VOC, 115.56 lb/mmcf; PM10/PM2.5, 7.42 lb/mmcf; and SOx, 2.08 lb/mmcf.

For normal operation, the emission factors shall be as follows: VOC, 6.67 lb/mmcf; PM10/PM2.5, 7.42 lb/mmcf; and SOx, 2.08 lb/mmcf.

For normal operation, the CO emissions shall be measured with certified CO CEMS. For the interim period after commissioning but prior to CEMS certification, and in the event of CEMS failure subsequent to CEMS certification, the emission factor shall be CO, 39.55 lb/mmcf.

For a month during which both commissioning and normal operation take place, the monthly emissions shall be the sum of the commissioning emissions and the normal operation emissions.

The project owner shall maintain records in a manner approved by the South Coast AQMD to demonstrate compliance with this condition and the records shall be made available to South Coast AQMD personnel upon request. The records shall include, but not be limited to, natural gas usage in a calendar month. [RULE 1303(a)(1)-BACT, RULE 1303(b)(2)-Offset, RULE 1703(a)(2) – PSD-BACT]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall provide emissions summary data in compliance with his condition as part of the Quarterly Operation reports (**AQ-SC7**).

AQ-A4 The project owner shall limit NOx emissions to 16.66 lbs/mmscf only during the turbine commissioning period to report RECLAIM emissions, not to exceed one year after the start of unit operations.

The project owner shall maintain records of natural gas usage for this period.

[RULE 2012]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall provide natural gas usage records for the turbines as part of the Quarterly Operation reports (**AQ-SC7**). The records shall identify the usage on a per turbine basis and clearly identify the corresponding commissioning project period.

AQ-A5 The project owner shall limit NOx emissions to ~~8.35~~ **8.79** lbs/mmscf only during the interim period after commissioning but prior to CEMS certification to report RECLAIM emissions, not to exceed one year after start of unit operations.

The project owner shall maintain records of natural gas usage for this period.

[RULE 2012]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall provide natural gas usage records for the turbines as part of the Quarterly Operation reports (**AQ-SC7**). The records shall identify the usage on a per turbine basis and clearly identify the corresponding post-commissioning, pre-CEMS project period.

AQ-A6 The project owner shall limit NOx emissions to 25.24 lbs/mmscf only during the turbine commissioning period to report RECLAIM emissions, not to exceed one year after the start of unit operations.

The project owner shall maintain records of natural gas usage for this period.

[RULE 2012]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall provide natural gas usage records for the turbines as part of the Quarterly Operation reports (**AQ-SC7**). The records shall identify the usage on a per turbine basis and clearly identify the corresponding commissioning project period.

AQ-A7 The project owner shall limit NOx emissions to 11.21 lbs/mmscf only during the interim period after commissioning but prior to CEMS certification to report RECLAIM emissions, not to exceed one year after start of unit operations.

The project owner shall maintain records of natural gas usage for this period.

[RULE 2012]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall provide natural gas usage records for the turbines as part of the Quarterly Operation reports (**AQ-SC7**). The records shall identify the usage on a per turbine basis and clearly identify the corresponding commissioning project period.

AQ-A8 The project owner shall limit NOx emissions to 38.46 lbs/mmscf only during the interim period after commissioning but prior to CEMS certification to report RECLAIM emissions, not to exceed one year after the start of unit operations.

The project owner shall maintain records of natural gas usage for this period.

The project owner shall limit NOx emissions to 104.20 lbs/mmscf only during boiler commissioning to report RECLAIM emissions, not to exceed one year after the start of unit operations.

The project owner shall maintain records of natural gas usage for this period.

[RULE 2012]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall provide natural gas usage records for the auxiliary boiler as part of the Quarterly Operation reports (**AQ-SC7**). The records shall clearly identify the corresponding commissioning project period.

AQ-A9 The project owner shall limit NOx emissions to 2.0 parts per million by volume (PPMV), averaged over 1-hour, dry basis at 15 percent oxygen. This limit shall not apply to turbine commissioning, startup, and shutdown periods.

[RULE 1703(a)(2) – PSD-BACT; RULE 2005]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**).

AQ-A10 The project owner shall limit NOx emissions to 2.5 parts per million by volume (PPMV), averaged over 1-hour, dry basis at 15 percent oxygen. This limit shall not apply to turbine commissioning, startup, and shutdown periods.

[RULE 1703(a)(2) – PSD-BACT; RULE 2005]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**).

AQ-A11 The project owner shall limit NOx emissions to 5.0 parts per million by volume (PPMV), averaged over 1-hour, dry basis at 3 percent oxygen. This limit shall not apply to boiler commissioning and startup periods.

[RULE 1703(a)(2) – PSD-BACT; RULE 2005]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**).

AQ-A12 The project owner shall limit CO emissions to 1.5 parts per million by volume (PPMV), averaged over 1-hour, dry basis at 15 percent oxygen. This limit shall not apply to turbine commissioning, startup, and shutdown periods.

[RULE 1303(a)(1)-BACT; RULE 1703(a)(2) – PSD-BACT]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**).

AQ-A13 The project owner shall limit CO emissions to 2.0 parts per million by volume (PPMV), averaged over 1-hour, dry basis at 15 percent oxygen. This limit shall not apply to turbine commissioning, startup, and shutdown periods.

[RULE 1303(a)(1)-BACT; RULE 1703(a)(2) – PSD-BACT]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**).

AQ-A14 The project owner shall limit CO emissions to 50.0 parts per million by volume (PPMV), averaged over 1-hour, dry basis at 3 percent oxygen. This limit shall not apply to boiler commissioning and startup.

[RULE 1303(a)(1)-BACT; RULE 1703(a)(2) – PSD-BACT]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**).

AQ-A15 The project owner shall limit VOC emissions to 2.0 parts per million by volume (PPMV), averaged over 1-hour, dry basis at 15 percent oxygen. This limit shall not apply to turbine commissioning, startup, and shutdown periods.

[RULE 1303(a)(1)-BACT; RULE 1703(a)(2) – PSD-BACT]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**).

AQ-A16 The 5.0 PPMV NH_3 emission limit is averaged over 1-hour, dry basis at 15 percent oxygen.

The project owner shall calculate and continuously record the NH_3 slip concentration using the following equation:

NH_3 (ppmvd) = [a-b*(c*1.2)/1,000,000]*1,000,000/b, where:

a = NH_3 injection rate (lb/hr)/17(lb/lb-mol)

b = dry exhaust gas flow rate (scf/hr)/385.3 scf/lb-mol)

c = change in measured NOx across the SCR (ppmvd at 15% O2)

The project owner shall install and maintain a NOx analyzer to measure the SCR inlet NOx ppmv accurate to within plus or minus 5 percent calibrated at least once every 12 months. The project owner shall use the method described above or another alternative method approved by the Executive Officer.

The ammonia slip calculation procedure shall be in effect no later than 90 days after initial startup of the turbine.

The ammonia slip calculation procedures described above shall not be used for compliance determination or emission information without corroborative data using an approved reference method for the determination of ammonia.

[RULE 1303(a)(1)-BACT]

[Devices subject to this condition: C170, C178 (combined-cycle), C188, C194, C200, C206 (simple-cycle)]

Verification: The project owner shall install, calibrate, maintain, and the monitoring system according to a ~~District~~ **South Coast AQMD**-approved monitoring plan. Prior to the installation the project owner shall submit a monitoring plan to the CPM for review and approval. The project owner shall include exceedances of the hourly ammonia slip limit and calibration reports as part of the Quarterly Operation Reports (**AQ-SC7**).

AQ-A17 The 5.0 PPMV NH_3 emission limit is averaged over 1-hour, dry basis at 3 percent oxygen.

The project owner shall calculate and continuously record the NH_3 slip concentration using the following equation:

NH_3 (ppmvd) = [a-b*(c*1.2)/1,000,000]*1,000,000/b, where:

a = NH_3 injection rate (lb/hr)/17(lb/lb-mol)

b = dry exhaust gas flow rate (scf/hr)/385.3 scf/lb-mol)

c = change in measured NOx across the SCR (ppmvd at 3% O2)

The project owner shall install and maintain a NOx analyzer to measure the SCR inlet NOx ppmv accurate to within plus or minus 5 percent calibrated at least once every 12 months. The project owner shall use the method described above or another alternative method approved by the Executive Officer.

The ammonia slip calculation procedure shall be in effect no later than 90 days after initial startup of the auxiliary boiler.

The ammonia slip calculation procedures described above shall not be used for compliance determination or emission information without corroborative data using an approved reference method for the determination of ammonia.

[RULE 1303(a)(1)-BACT]

[Devices subject to this condition: C183 (auxiliary boiler)]

Verification: The project owner shall install, calibrate, maintain, and the monitoring system according to a ~~District~~ **South Coast AQMD**-approved monitoring plan. Prior to the installation the project owner shall submit a monitoring plan to the CPM for review and approval. The project owner shall include exceedances of the hourly ammonia slip limit and calibration reports as part of the Quarterly Operation Reports (**AQ-SC7**).

AQ-A18 The project owner shall limit PM10 emissions to 0.01 grain per standard cubic feet (grains/scf) or 11 pounds per hour (lbs/hr). For the purpose of determining compliance with ~~District~~ **South Coast AQMD** Rule 475, combustion contaminant emissions may exceed the concentration limit or the mass emission limit listed, but not both limits at the same time.

[RULE 475]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (AQ-SC8). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

Material/Fuel Type limits

AQ-B1 The project owner shall not use natural gas containing the following specified compounds:

Compound	Range	Emissions Limit
H_2S	Greater than	0.25 grain/100scf

This concentration limit is an annual average based on monthly samples of natural gas composition or gas supplier documentation. Gaseous fuel samples shall be tested using ~~District~~ **South Coast AQMD** Method 307-91 for total sulfur calculated as H_2S.

[RULE 1303(a)(1)-BACT]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall include documentation demonstrating compliance as part of the Quarterly Operation Reports (**AQ-SC8**). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

Operating Parameters

AQ-C1 The project owner shall limit the number of start-ups to no more than 62 in any one calendar month.

The number of cold startups shall not exceed 15 in any calendar month, with no more than 2 startups in any one day.

The number of cold startups shall not exceed 80 in any calendar year, and the total number of startups shall not exceed 500 in any calendar year.

For the purposes of this condition, a cold startup is defined as a startup which occurs after the combustion turbine has been shut down for 48 hours or more. A cold startup shall not exceed 60 minutes. The NOx emissions from a cold startup shall not exceed 61 lbs. The CO emissions from a cold startup shall not exceed 325 lbs. The VOC emissions from a cold startup shall not exceed 36 lbs.

For the purposes of this condition, a non-cold startup is defined as a startup which occurs after the combustion turbine has been shut down less than 48 hours. A non-cold startup shall not exceed 30 minutes. The NOx emissions from a non-cold startup shall not exceed ~~17~~ **32** lbs. The CO emissions from a non-cold startup shall not exceed 137 lbs. The VOC emissions from a non-cold startup shall not exceed 25 lbs.

The beginning of startup occurs at initial fire in the combustor and the end of startup occurs when the BACT levels are achieved. If during startup the process is aborted the process will count as one startup.

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall provide records including a table documenting the type of startup, duration and date of occurrence.

AQ-C2 The project owner shall limit the number of shutdowns to no more than 62 in any one calendar month.

The number of shutdowns shall not exceed 500 in any calendar year.

Each shutdown shall not exceed 30 minutes. The NOx emissions from a shutdown event shall not exceed 10 lbs. The CO emissions from a shutdown

event shall not exceed 133 lbs. The VOC emissions from a shutdown event shall not exceed 32 lbs.

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall provide records including a table documenting each shutdown, and indicating the duration and date of occurrence.

AQ-C3 The project owner shall limit the number of start-ups to no more than 62 in any one calendar month.

The number of startups shall not exceed 2 startups in any one day. The number of startups shall not exceed 500 in any calendar year.

A startup shall not exceed 30 minutes. The NOx emissions from a startup shall not exceed 16.6 lbs. The CO emissions from a startup shall not exceed 15.4 lbs. The VOC emissions from a startup shall not exceed 2.80 lbs.

The beginning of startup occurs at initial fire in the combustor and the end of startup occurs when the BACT levels are achieved. If during startup the process is aborted the process will count as one startup.

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall provide records including a table documenting the type of startup, duration and date of occurrence.

AQ-C4 The project owner shall limit the number of shutdowns to no more than 62 in any one calendar month.

The number of shutdowns shall not exceed 500 in any calendar year.

Each shutdown shall not exceed 13 minutes. The NOx emissions from a shutdown event shall not exceed 3.12 lbs. The CO emissions from a shutdown event shall not exceed 28.1 lbs. The VOC emissions from a shutdown event shall not exceed 3.06 lbs.

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall provide records including a table documenting each shutdown~~,~~ and indicating the duration and date of occurrence.

AQ-C5 The project owner shall limit the number of start-ups to no more than 10 in any one calendar month.

The number of cold startups shall not exceed 2 in any calendar month, the number of warm startups shall not exceed 4 in any calendar month, and the number of hot starts shall not exceed 4 in any calendar month, with no more than 1 startup in any one day.

The number of cold startups shall not exceed 24 in any calendar year, the number of warm startups shall not exceed 48 in any calendar year, and the number of hot startups shall not exceed 48 in any calendar year.

For the purposes of this condition, a cold startup is defined as a startup which occurs after the auxiliary boiler has been shut down for 48 hours or more. A cold startup shall not exceed 170 minutes. The NOx emissions from a cold startup shall not exceed 4.22 lbs.

For the purposes of this condition, a warm startup is defined as a startup which occurs after the auxiliary boiler has been shut down 10 hours or more but less than 48 hours. A warm startup shall not exceed 85 minutes. The NOx emissions from a warm startup shall not exceed 2.11 lbs.

For the purposes of this condition, a hot startup is defined as a startup which occurs after the auxiliary boiler has been shut down for less than 10 hours. A hot startup shall not exceed 25 minutes. The NOx emissions from a hot startup shall not exceed 0.62 lbs.

The project owner shall maintain records in a manner approved by the South Coast AQMD, to demonstrate compliance with this condition and the records shall be made available to South Coast AQMD personnel upon request.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall provide records including a table indicating documenting type of startup, duration and date of occurrence.

AQ-C6 The project owner shall install and maintain a pressure relief valve set at 50 psig.

[RULE 1303(a)(1)-BACT, RULE 1303(a)(1)-BACT]

[Devices subject to this condition: D163, D164 (ammonia tank)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall provide records including a table indicating documenting type of startup, duration and date of occurrence.

Monitoring/Testing Parameters

AQ-D1 The project owner shall install and maintain a flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH_3).

The project owner shall also install and maintain a device to continuously record the parameter being measured. Continuously record shall be defined as measuring at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

The flow meter shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

The project owner shall maintain the ammonia injection rate between ~~44~~ **20** and 242 pounds per hour, except during startups and shutdowns.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: C170, C178 (combined-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D2 The project owner shall install and maintain a temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor

The project owner shall also install and maintain a device to continuously record the parameter being measured. Continuously record shall be defined as measuring at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

The temperature gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

The exhaust temperature at the inlet of the SCR/CO catalyst shall be maintained between ~~570~~ **450** degrees Fahrenheit and ~~692~~ **800** degrees Fahrenheit, except during startups and shutdowns.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: C170, C178 (combined-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D3 The project owner shall install and maintain a pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches water column.

The project owner shall also install and maintain a device to continuously record the parameter being measured. Continuously record shall be defined as measuring at least once every month and shall be calculated based upon the average of the continuous monitoring for that month.

The pressure gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

The pressure differential shall not exceed 1.6 inches water column.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: C170, C178 (combined-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D4 The project owner shall install and maintain a flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH_3).

The project owner shall also install and maintain a device to continuously record the parameter being measured. Continuously record shall be defined

as measuring at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

The flow meter shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

The project owner shall maintain the ammonia injection rate between 110 and 180 pounds per hour, except during startups and shutdowns.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: C188, C194, C200, C206 (simple-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D5 The project owner shall install and maintain a temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor

The project owner shall also install and maintain a device to continuously record the parameter being measured. Continuously record shall be defined as measuring at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

The temperature gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

The exhaust temperature at the inlet of the SCR/CO catalyst shall be maintained between 500 degrees Fahrenheit and 870 degrees Fahrenheit, except during startups and shutdowns.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: C188, C194, C200, C206 (simple-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D6 The project owner shall install and maintain a pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches water column.

The project owner shall also install and maintain a device to continuously record the parameter being measured. Continuously record shall be defined

as measuring at least once every month and shall be calculated based upon the average of the continuous monitoring for that month.

The pressure gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

The pressure differential shall not exceed 3.0 inches water column.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: C188, C194, C200, C206 (simple-cycle)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D7 The project owner shall install and maintain a flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH_3).

The project owner shall also install and maintain a device to continuously record the parameter being measured. Continuously record shall be defined as measuring at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

The flow meter shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

The project owner shall maintain the ammonia injection rate between 0.3 and 3.9 pounds per hour.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: C183 (auxiliary boiler)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the South Coast AQMD, ARB, and the Energy Commission.

AQ-D8 The project owner shall install and maintain a temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor

The project owner shall also install and maintain a device to continuously record the parameter being measured. Continuously record shall be defined as measuring at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

The temperature gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

The exhaust temperature at the inlet of the SCR/CO catalyst shall be maintained between 415 degrees Fahrenheit and 628 degrees Fahrenheit, except during startups and shutdowns.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: C183 (auxiliary boiler)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D9 The project owner shall install and maintain a pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches water column.

The project owner shall also install and maintain a device to continuously record the parameter being measured. Continuously record shall be defined as measuring at least once every month and shall be calculated based upon the average of the continuous monitoring for that month.

The pressure gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

The pressure differential shall not exceed 2.0 inches water column.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: C183 (auxiliary boiler)]

Verification: The project owner shall demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC7**). The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D10 The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be Tested	Required Test Method(s)	Averaging Time	Test Location
NOx emissions	~~District~~ **South Coast AQMD** Method 100.1	1 hour	Outlet of the SCR serving this equipment
CO emissions	~~District~~ **South Coast AQMD** Method 100.1	1 hour	Outlet of the SCR serving this equipment
SOx emissions	**South Coast** AQMD Laboratory Method 307-91	~~District~~ **South Coast AQMD** Approved Averaging Time	Fuel Sample

VOC emissions	~~District~~ **South Coast AQMD** Method 25.3 Modified	1 hour	Outlet of the SCR serving this equipment
PM10 emissions	EPA Method 201A / ~~District~~ **South Coast AQMD** Method 5.1	~~District~~ **South Coast AQMD** Approved Averaging Time	Outlet of the SCR serving this equipment
PM2.5 emissions	EPA Method 201A / 202	~~District~~ **South Coast AQMD** Approved Averaging Time	Outlet of the SCR serving this equipment
NH_3 emissions	~~District~~ **South Coast AQMD** Method 207.1 ~~and 5.3 or EPA Method 17~~	1 hour	Outlet of the SCR serving this equipment

The test shall be conducted after ~~District~~ **South Coast AQMD** approval of the source test protocol, but no later than 180 days after initial start-up. The ~~District~~ **South Coast AQMD** shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, the combined-cycle turbine and steam turbine generating output in MW-gross and MW-net, and the simple-cycle turbine generating output in MW-gross and MW-net.

The test shall be conducted in accordance with a ~~District~~ **South Coast AQMD** approved source test protocol. The protocol shall be submitted to the ~~SCAQMD~~ **South Coast AQMD** engineer no later than 90 days before the proposed test date and shall be approved by the ~~District~~ **South Coast AQMD** before the test commences.

The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The sampling time for PM and PM2.5 tests shall be 4 hours or longer as necessary to obtain a measureable amount of sample.

The tests shall be conducted when the combined-cycle turbine is operating at loads of 45, 75, and 100 percent of maximum load, and the simple-cycle turbine is operating at loads of 50, 75, and 100 percent of maximum load.

For natural gas fired turbines only, for the purpose of demonstrating compliance with VOC BACT limits as determined by ~~SCAQMD~~ **South Coast AQMD**, the operator shall use ~~SCAQMD~~ **South Coast AQMD** Method 25.3 modified as follows:

A. Triplicate stack gas samples extracted directly into Summa canisters, maintaining a final canister pressure between 400-500 mm Hg absolute,

B. Pressurization of the Summa canisters with zero gas analyzed/certified to less than 0.05 ppmv total hydrocarbons as carbon, and

C. Analysis of Summa canisters per the canister analysis portion of **South Coast** AQMD Method 25.3 with a minimum detection limit of 0.3 ppmv or less and reported to two significant figures. The temperature of the Summa canisters when extracting the samples for analysis shall not be below 70 F.

The use of this modified method for VOC compliance determination does not mean that it is more accurate than unmodified **South Coast** AQMD Method 25.3, nor does it mean that it may be used in lieu of **South Coast** AQMD Method 25.3 without prior approval, except for the determination of compliance with the BACT level of 2.0 ppmv VOC calculated as carbon for natural gas fired turbines.

For purposes of this condition, an alternative test method may be allowed for any of the above pollutants upon concurrence by EPA, CARB, and ~~SCAQMD~~ **South Coast AQMD**.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit the proposed protocol for the initial source tests no later than 90 days prior to the proposed source test date to both the ~~District~~ **South Coast AQMD** and CPM for approval. The project owner shall notify the ~~District~~ **South Coast AQMD** and CPM no later than 10 days prior to the proposed initial source test of the date and time of the scheduled test.

AQ-D11 The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be Tested	Required Test Method(s)	Averaging Time	Test Location
SOx emissions	AQMD Laboratory Method 307-91	~~District~~ **South Coast AQMD** Approved Averaging Time	Fuel Sample
VOC emissions	~~District~~ **South Coast AQMD** Method 25.3 Modified	1 hour	Outlet of the SCR serving this equipment
PM10 emissions	EPA Method 201A / ~~District~~ **South Coast AQMD** Method 5.1	~~District~~ **South Coast AQMD** -Approved Averaging Time	Outlet of the SCR serving this equipment

The test(s) shall be conducted at least once every three years.

The test shall be conducted and the results submitted to the ~~District~~ **South Coast AQMD** within 60 days after the test date. The ~~SCAQMD~~ **South Coast AQMD** shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted when this equipment is operating at 100 percent of maximum load.

For natural gas fired turbines only, for the purpose of demonstrating compliance with VOC BACT limits, as determined by ~~SCAQMD~~ **South Coast AQMD**, the operator shall use Method 25.3 modified as follows:

A. Triplicate stack gas samples extracted directly into Summa canisters, maintaining a final canister pressure between 400-500 mm Hg absolute,

B. Pressurization of the Summa canisters with zero gas analyzed/certified to less than 0.05 ppmv total hydrocarbons as carbon, and

C. Analysis of Summa canisters per the canister analysis portion of AQMD Method 25.3 with a minimum detection limit of 0.3 ppmv or less and reported to two significant figures. The temperature of the Summa canisters when extracting the samples for analysis shall not be below 70 F.

The use of this modified method for VOC compliance determination does not mean that it is more accurate than unmodified AQMD Method 25.3, nor does it mean that it may be used in lieu of AQMD Method 25.3 without prior approval, except for the determination of compliance with the BACT level of 2.0 ppmv VOC calculated as carbon for natural gas fired turbines.

For purposes of this condition, an alternative test method may be allowed for any of the above pollutants upon concurrence by EPA, CARB, and ~~SCAQMD~~ **South Coast AQMD**.

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration and/or monthly emissions limit.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall test according to the original protocol. If changes to the testing methods or testing conditions are proposed then the project owner shall submit a revised protocol for the source tests no later than 45 days prior to the proposed source test date to both the ~~District~~ **South Coast AQMD** and CPM for approval. The project owner shall submit the source test results no later than 60 days following the source test date to both the ~~District~~ **South Coast AQMD** and CPM. The project owner shall notify the ~~District~~ **South Coast AQMD** and CPM no later than 10 days prior to the proposed initial source test of the date and time of the scheduled test.

AQ-D12 The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be Tested	Required Test Method(s)	Averaging Time	Test Location
NH_3 emissions	~~District~~ **South Coast AQMD** Method 207.1	1 hour	Outlet of the SCR serving this equipment

The test shall be conducted and the results submitted to the South Coast AQMD within 60 days after the test date. The South Coast AQMD shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted at least quarterly during the first twelve months of operation **of the catalytic control device** and ~~at least~~ annually thereafter **when four consecutive quarterly source tests demonstrate compliance with the ammonia emission limit. If an annual test is failed, four consecutive quarterly source tests must demonstrate compliance with the ammonia emissions limits prior to resuming annual source tests.**

The NOx concentration, as determined by the certified CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable or not yet certified, a test shall be conducted to determine the NOx emissions using South Coast AQMD Method 100.1 measured over a 60 minute averaging time period.

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration limit.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT]

[Devices subject to this condition: C170, C178 (combined-cycle), C188, C194, C200, C206 (simple-cycle), C183 (auxiliary boiler)]

Verification: The project owner shall test according to the original protocol. If changes to the testing methods or testing conditions are proposed then the project owner shall submit a revised protocol for the source tests no later than 45 days prior to the proposed source test date to both the South Coast AQMD and CPM for approval. The project owner shall submit the source test results no later than 60 days following the source test date to both the South Coast AQMD and CPM. The project owner shall notify the South Coast AQMD and CPM no later than 10 days prior to the proposed initial source test of the date and time of the scheduled test.

AQ-D13 The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be Tested	Required Test Method(s)	Averaging Time	Test Location
NOx emissions	~~District~~ **South Coast AQMD** Method 100.1	1 hour	Outlet of the SCR serving this equipment
CO emissions	~~District~~ **South Coast AQMD** Method 100.1	1 hour	Outlet of the SCR serving this equipment

SOx emissions	AQMD Laboratory Method 307-91	~~District~~ **South Coast AQMD** Approved Averaging Time	Fuel Sample
VOC emissions	~~District~~ **South Coast AQMD** Method 25.3	1 hour	Outlet of the SCR serving this equipment
PM10 emissions	EPA Method 201A / ~~District~~ **South Coast AQMD** Method 5.1	~~District~~ **South Coast AQMD** -Approved Averaging Time	Outlet of the SCR serving this equipment
PM2.5 emissions	EPA Method 201A / 202	~~District~~ **South Coast AQMD** -Approved Averaging Time	Outlet of the SCR serving this equipment
NH_3 emissions	~~District~~ **South Coast AQMD** Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of the SCR serving this equipment

The test shall be conducted after South Coast AQMD approval of the source test protocol, but no later than 180 days after initial start-up. The South Coast AQMD shall be notified of the date and time of the test at least 10 days prior to the test.

For each firing rate, the following operating data shall be included: (1) the exhaust flow rates, in actual cubic feet per minute (acfm), (2) the firing rates in Btu/hour, (3) the exhaust temperature, in degrees Fahrenheit, (4) the oxygen content of the exhaust gases, in percent, and (5) the fuel flow rate.

The test shall be conducted in accordance with a South Coast AQMD approved source test protocol. The protocol shall be submitted to the South Coast AQMD engineer no later than 90 days before the proposed test date and shall be approved by the ~~District~~ **South Coast AQMD** before the test commences.

The test protocol shall include the identity of the testing lab, confirmation that the test lab is approved under the South Coast AQMD Laboratory Approval Program for the required test method for the CO pollutant, a statement from the testing lab certifying that it meets the criteria of Rule 304 (no conflict of interest), and a description of all sampling and analytical procedures.

The sampling facilities shall comply with the South Coast AQMD Guidelines for Construction of Sampling and Testing Facilities, pursuant to Rule 217.

The sampling time for the PM**10** and PM2.5 tests shall be 1 hour or longer as necessary to obtain a measureable amount of sample.

The test shall be conducted when this equipment is operating at maximum, minimum, and normal operating rates.

For purposes of this condition, an alternative test method may be allowed for any of the above pollutants upon concurrence by EPA, ARB, and South Coast AQMD.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall submit the proposed protocol for the initial source tests no later than 90 days prior to the proposed source test date to both the South Coast AQMD and CPM for approval. The project owner shall submit the source test results no later than 60 days following the source test date to both the South Coast AQMD and CPM. The project owner shall notify the South Coast AQMD and CPM no later than 10 days prior to the proposed initial source test of the date and time of the scheduled test.

AQ-D14 The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be Tested	Required Test Method(s)	Averaging Time	Test Location
NH_3 emissions	~~District~~ **South Coast AQMD** Method 207.1	1 hour	Outlet of the SCR serving this equipment

The test shall be conducted and the results submitted to the South Coast AQMD within 60 days after the test date. The South Coast AQMD shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted at least quarterly to demonstrate compliance with the ammonia emission limit during the first twelve months of operation and at least annually thereafter, except that source tests may be conducted annually within 12 months thereafter when four consecutive quarterly source test demonstrate compliance with the ammonia emission limit. If an annual test is failed, four consecutive quarterly source test must demonstrate compliance with the ammonia emissions limits prior to resuming annual source tests.

The NOx concentration, as determined by the certified CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable or not yet certified, a test shall be conducted to determine the NOx emissions using South Coast AQMD Method 100.1 measured over a 60 minute averaging time period.

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration limit.

[RULE 1146, RULE 1303(a)(1)-BACT, RULE 1303(b)(2)-Offset, RULE 1703(a)(2)-PSD-BACT]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall test according to the original protocol. If changes to the testing methods or testing conditions are proposed then the project owner shall submit a revised protocol for the source tests no later than 45 days prior to the proposed source test date to both the South Coast AQMD and CPM for approval. The project owner shall submit the source test results no later than 60 days following

the source test date to both the South Coast AQMD and CPM. The project owner shall notify the South Coast AQMD and CPM no later than 10 days prior to the proposed initial source test of the date and time of the scheduled test.

AQ-D15 The project owner shall install and maintain a CEMS to measure the following parameters:

CO concentration in ppmv.

Concentrations shall be corrected to 15 percent oxygen on a dry basis.

The CEMS shall be installed and operated to measure CO concentrations over a 15 minute averaging time period.

The CEMS shall be installed and operating no later than 90 days after initial start-up of the turbine, and in accordance with an approved ~~SCAQMD~~ **South Coast AQMD** Rule 218 CEMS plan application. The project owner shall not install the CEMS prior to receiving initial approval from ~~SCAQMD~~ **South Coast AQMD**.

The CEMS will convert the actual CO concentrations to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis.

CO Emission Rate, lbs/hr = K*Cco*Fd[20.9/(20.9% - $\%O_2$ d)][(Qg * HHV)/10E+06], where:

1. K = 7.267 *10E-08 (lb/scf)/ppm
2. Cco = Average of four consecutive 15 min. average CO concentrations, ppm
3. Fd = 8710 dscf/MMBTU natural gas
4. $\%O_2$ d = Hourly average % by volume O_2 dry, corresponding to Cco
5. Qg = Fuel gas usage during the hour, scf/hr
6. HHV = Gross high heating value of fuel gas, BTU/scf

[RULE 1303(a)(1)-BACT; RULE 1703(a)(2) – PSD-BACT]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit the ~~SCAQMD~~ **South Coast AQMD** approved CEMS plan to the CPM within 90 days of ~~SCAQMD~~ **South Coast AQMD** approval. The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D16 The project owner shall install and maintain a CEMS to measure the following parameters:

NOx concentration in ppmv.

Concentrations shall be corrected to 15 percent oxygen on a dry basis.

The CEMS shall be installed and operating no later than 90 days after initial start-up of the turbine, and in accordance with an approved ~~SCAQMD~~ **South Coast AQMD** REG XX CEMS plan application. The project owner shall not install the CEMS prior to receiving initial approval from ~~SCAQMD~~ **South Coast AQMD**.

Rule 2012 provisional RATA testing shall be completed and submitted to the ~~SCAQMD~~ **South Coast AQMD** within 90 days of the conclusion of the turbine commissioning period. During the interim period between the initial start-up and the provisional certification date of the CEMS, the project owner shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3).

[RULE 1703(a)(2) – PSD-BACT, RULE 2005, RULE 2012]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit the ~~SCAQMD~~ **South Coast AQMD** approved CEMS plan to the CPM within 90 days of ~~SCAQMD~~ **South Coast AQMD** approval. The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D17 The project owner shall install and maintain a CEMS to measure the following parameters:

NOx concentration in ppmv.

Concentrations shall be corrected to 3 percent oxygen on a dry basis.

The CEMS shall be installed and operating no later than 90 days after initial start-up of the auxiliary boiler, and in accordance with an approved ~~SCAQMD~~ **South Coast AQMD** REG XX CEMS plan application. The project owner shall not install the CEMS prior to receiving initial approval from ~~SCAQMD~~ **South Coast AQMD**.

Rule 2012 provisional RATA testing shall be completed and submitted to the ~~SCAQMD~~ **South Coast AQMD** within 90 days of the conclusion of the boiler commissioning period. During the interim period between the initial start-up and the provisional certification date of the CEMS, the project owner shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3).

[RULE 1703(a)(2) – PSD-BACT, RULE 2005, RULE 2012]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall submit the ~~SCAQMD~~ **South Coast AQMD** approved CEMS plan to the CPM within 90 days of ~~SCAQMD~~ **South Coast AQMD** approval. The project owner shall make the site available for inspection of records by representatives of the ~~District~~ **South Coast AQMD**, ARB, and the Energy Commission.

AQ-D18 The project owner shall install and maintain a CEMS to measure the following parameters:

CO concentration in ppmv.

Concentrations shall be corrected to 3 percent oxygen on a dry basis.

The CEMS shall be installed and operated to measure CO concentrations over a 15-minute averaging time period.

The CEMS shall be installed and operating no later than 90 days after initial start-up of the turbine, and in accordance with an approved South Coast AQMD Rule 218 CEMS plan application. The project owner shall not install the CEMS prior to receiving initial approval from ~~SCAQMD~~ **South Coast AQMD**.

The CEMS shall convert the actual CO concentration to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis.

[RULE 1303(a)(1) – BACT, RULE 1703(a)(1) – PSD-BACT]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall submit the ~~SCAQMD~~ **South Coast AQMD** approved CEMS plan and any subsequent revisions to the CPM within 90 days of South Coast AQMD approval. The project owner shall make the site available for inspection of records by representatives of the South Coast AQMD, ARB, and the Energy Commission.

Equipment Operation/Construction Requirements

AQ-E1 The project owner shall upon completion of construction, operate and maintain this equipment according to the following requirements:

In accordance with all air quality mitigation measures stipulated in the final California Energy Commission decision for the 13-AFC-01 project.

[CA PRC CEQA]

[Devices subject to this condition: D163, D164, D165, C170, D173, C178, D181, C183, D185, C188, D191, C194, D197, C200, D203, C206, D209, D210]

Verification: The project owner shall make the site available for inspection by representatives of the ~~District~~ **South Coast AQMD**, ARB, U.S. EPA and the Energy Commission.

AQ-E2 The project owner shall install this equipment according to the following requirements:

The Permit to Construct shall expire one year from the issuance date, unless an extension has been granted by the Executive Officer or unless the equipment has been constructed and the operator has notified the Executive Officer prior to the operation of the equipment.

Construction of Phase 1 of the project (defined as the combined-cycle turbines and associated control equipment, the auxiliary boiler and associated control equipment, storage tank D163, and oil water separator D209), shall commence within 18 months from the date of the Permit to Construct, unless an extension is granted by the Permitting Authority (~~SCAQMD~~ **South Coast AQMD**).

Construction of Phase 2 of the project (defined as the simple cycle turbines and associated control equipment, storage tank D164, and oil water separator D210) shall commence within 18 months of ~~May 31, 2020~~ **June 30, 2022** unless an extension is granted by the Permitting Authority (~~SCAQMD~~ **South Coast AQMD**).

Construction shall not be discontinued for a period of 18 months or more at any time during Phase 1 or Phase 2.

[RULE 205, 40 CFR 52.21 - PSD]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle), D181 (auxiliary boiler), C170, C178 (combined-cycle control), C188, C194, C200, C206 (simple-cycle control), C183 (auxiliary boiler control), D163, D164 (ammonia tanks), D209, D210 (oil-water separators)]

Verification: The project owner shall make the site available for inspection by representatives of the ~~District~~ **South Coast AQMD**, ARB, U.S. EPA and the Energy Commission.

AQ-E3 The project owner shall operate and maintain this equipment according to the following requirements:

Total commissioning hours shall not exceed 996 hours of fired operation for each turbine from the date of initial turbine start-up. Of the 996 hours, commissioning hours without control shall not exceed 216 hours.

Two turbines may be commissioned at the same time.

The project owner shall vent this equipment to the CO oxidation catalyst and SCR control system whenever the turbine is in operation after commissioning is completed.

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**. The records shall include, but not be limited to, the total number of commissioning hours, number of commissioning hours without control, and natural gas fuel usage.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall submit all records including the total number of commissioning hours, number of commissioning hours without control, and fuel usage per turbine to demonstrate compliance with this condition as part of the Quarterly Operational Report required in **AQ-SC7**. The project owner shall make the site available for inspection by representatives of the ~~District~~ **South Coast AQMD**, ARB, U.S. EPA and the Energy Commission.

AQ-E4 The project owner shall operate and maintain this equipment according to the following requirements:

Total commissioning hours shall not exceed 280 hours of fired operation for each turbine from the date of initial turbine start-up. Of the 280 hours, commissioning hours without control shall not exceed 4 hours.

Four turbines may be commissioned at the same time.

The project owner shall vent this equipment to the CO oxidation catalyst and SCR control system whenever the turbine is in operation after commissioning is completed.

The project owner shall provide the ~~SCAQMD~~ **South Coast AQMD** with written notification of the initial startup date. The project owner shall maintain records in a manner approved by the ~~SCAQMD~~ **South Coast AQMD** to demonstrate compliance with this condition and the records shall be made available to ~~SCAQMD~~ **South Coast AQMD** personnel upon request. The records shall include, but not be limited to, the total number of commissioning hours, number of commissioning hours without control, and natural gas fuel usage.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit all records including the total number of commissioning hours, number of commissioning hours without control, and fuel usage per turbine to demonstrate compliance with this condition as part of the Quarterly Operational Report required in **AQ-SC7**. The project owner shall make the site available for inspection by representatives of the ~~District~~ **South Coast AQMD**, ARB, U.S. EPA and the Energy Commission.

AQ-E5 The project owner shall operate and maintain this equipment according to the following requirements

The total commissioning period shall not exceed 100 hours of fired operation for the auxiliary boiler from the date of initial boiler start-up.

The project owner shall vent this equipment to the SCR control system whenever the auxiliary boiler is in operation after commissioning is completed.

The project owner shall provide the South Coast AQMD with written notification of the initial startup date. The project owner shall maintain records in a manner approved by the South Coast AQMD to demonstrate compliance with this condition and the records shall be made available to South Coast AQMD personnel upon request. The records shall include, but not be limited to, the number of commissioning hours and natural gas fuel usage.

[RULE 1303(a)(1)-BACT, RULE 1703(a)(2)-PSD-BACT, RULE 2005]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall submit all records including the total number of commissioning hours and fuel usage to demonstrate compliance with this condition as part of the Quarterly Operational Report required in **AQ-SC7**. The project owner shall make the site available for inspection by representatives of the South Coast AQMD, ARB, U.S. EPA and the Energy Commission.

AQ-E6 The project owner shall upon completion of the construction, operate and maintain this equipment according to the following requirements:

The 1,000 lbs per gross megawatt-hours CO_2 emission limit (inclusive of degradation) shall only apply if this turbine supplies greater than 1,481,141 MWh-net electrical output to a utility power distribution system on both a 12-operating-month and a 3-year rolling average basis.

Compliance with the 1,000 lbs per gross megawatt-hours CO_2 emission limit (inclusive of degradation) shall be determined on a 12-operating-month rolling average basis.

This turbine shall be operated in compliance with all applicable requirements of 40 CFR 60 Subpart TTTT.

[40 CFR 60 Subpart TTTT]

[Devices subject to this condition: D165, D173]

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations to demonstrate compliance with this condition as part of the 4th quarter Quarterly Operational Report required in **AQ-SC7**.

AQ-E7 The project owner shall upon completion of the construction, operate and maintain this equipment according to the following requirements:

The 120 lbs/MMBtu CO_2 emission limit shall only apply if this turbine supplies no more than 1,481,141 MWh-net electrical output to a utility power distribution system on either a 12-operating-month or a 3-year rolling average basis.

Compliance with the 120 lbs/MMBtu CO_2 emission limit shall be determined on a 12-operating-month rolling average basis.

This turbine shall be operated in compliance with all applicable requirements of 40 CFR 60 Subpart TTTT.

[40 CFR 60 Subpart TTTT]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations to demonstrate compliance with this condition as part of the 4th quarter Quarterly Operational Report required in **AQ-SC7**.

AQ-E8 The project owner shall upon completion of the construction, operate and maintain this equipment according to the following requirements:

The 120 lbs/MMBtu CO_2 emission limit for non-base load turbines shall apply.

Compliance with the 120 lbs/MMBtu CO_2 emission limit shall be determined on a 12-operating-month rolling average basis.

This turbine shall be operated in compliance with all applicable requirements of 40 CFR 60 Subpart TTTT, including applicable requirements for recordkeeping and reporting.

[40 CFR 60 Subpart TTTT]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations to demonstrate compliance with this condition as part of the 4th quarter Quarterly Operational Report required in **AQ-SC7**.

AQ-E9 The project owner shall upon completion of the construction, operate and maintain this equipment according to the following requirements:

The project owner shall record the total net power generated in a calendar month in megawatt-hours.

The project owner shall calculate and record greenhouse gas emissions for each calendar month using the following formula:

GHG = 61.41 * FF

Where GHG is the greenhouse gas emissions in tons of CO_2 and FF is the monthly fuel usage in millions standard cubic feet.

The project owner shall calculate and record the CO_2 emissions in pounds per net megawatt-hour based on a 12-month rolling average. The CO_2 emissions from this equipment shall not exceed ~~610,480~~ **861,119** tons per year per turbine on a 12-month rolling average basis. The calendar annual average CO_2 emissions shall not exceed ~~937.88~~ **916.01** lbs per gross megawatt-hours (inclusive of equipment degradation).

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**.

[RULE 1714]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations to demonstrate compliance with this condition as part of the 4th quarter Quarterly Operational Report required in **AQ-SC7**.

AQ-E10 The project owner shall upon completion of the construction, operate and maintain this equipment according to the following requirements:

The project owner shall record the total net power generated in a calendar month in megawatt-hours.

The project owner shall calculate and record greenhouse gas emissions for each calendar month using the following formula:

GHG = 61.41 * FF

Where GHG is the greenhouse gas emissions in tons of CO_2 and FF is the monthly fuel usage in millions standard cubic feet.

The project owner shall calculate and record the CO_2 emissions in pounds per net megawatt-hour based on a 12-month rolling average. The CO_2 emissions from this equipment shall not exceed ~~120,765~~ **54,185** tons per year per turbine on a 12-month rolling average basis. The calendar annual average CO_2 emissions shall not exceed ~~1,356.03~~ **1,506.98** lbs per gross megawatt-hours (inclusive of equipment degradation).

The project owner shall maintain records to demonstrate compliance with this condition and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**.

[RULE 1714]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations to demonstrate compliance with this condition as part of the 4th quarter Quarterly Operational Report required in **AQ-SC7**.

AQ-E11 The project owner shall comply with the following requirements:

The total electrical output on a gross basis from Combined-Cycle Turbines Nos. CCGT-1 and CCGT-2 **(**Devices D165 and D173, respectively), common Steam Turbine Generator, and Simple-Cycle Turbines Nos. SCGT-1, SCGT-2, SCGT-3, and SCGT-4 (Device D185, D191, D197, and D203, respectively) shall not exceed 1094.7 MW-gross at 59 degree Fahrenheit.

The gross electrical output shall be measured at the single generator serving each of the combined-cycle turbines, the single generator serving the common steam turbine, and the single generator servicing each of the simple-cycle turbines. The monitoring equipment shall meet ANSI Standard No. C12 or equivalent, and have an accuracy of +/- 0.2 percent. The gross electrical output from the generators shall be recorded at the CEMS DAS over a 15-minute averaging time period.

The project owner shall record and maintain written records of the maximum amount of electricity produced from this equipment and shall make such records available to the Executive Officer upon request. The records shall be maintained for a minimum of 5 years in a manner approved by ~~SCAQMD~~ **South Coast AQMD**.

[RULE 1303(b)(2)-Offset, RULE 2005]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations to demonstrate compliance with this condition as part of the 4th quarter Quarterly Operational Report required in **AQ-SC7**.

AQ-E12 The project owner shall vent this equipment, during filling, only to the vessel from which it is being filled.

[RULE 1303(a)(1)-BACT]

[Devices subject to this condition: D163, D164 (ammonia tank)]

Verification: The project owner shall make the site available for inspection by representatives of the ~~District~~ **South Coast AQMD**, ARB, U.S. EPA and the Energy Commission.

AQ-E13 The project owner shall construct, operate, and main this equipment according to the following requirements:

The equipment shall be equipped with a fixed cover to minimize VOC emissions.

[Devices subject to this condition: D209, D210 (oil water separator)]

Verification: The project owner shall make the site available for inspection by representatives of the ~~District~~ **South Coast AQMD**, ARB, U.S. EPA and the Energy Commission.

AQ-E14 Notwithstanding the requirements of Section E conditions, the project owner may commence the construction of Phase II of this project if all the following condition(s) are met:

The BACT/LAER determination for Phase II of this project shall be reviewed and modified (by South Coast AQMD) as appropriate at the latest reasonable time which occurs no later than 18 months prior to the commencement of construction of Phase II of the project. [40 CFR 52.21 - PSD]

[Devices subject to this condition: ~~D165, D173 (combined cycle)~~, D185, D191, D197, D203 (simple-cycle), ~~D181 (auxiliary boiler), C170, C178 (combined cycle control),~~ C188, C194, C200, C206 (simple-cycle control), ~~C183 (auxiliary boiler control),~~ ~~D163~~, D164 (ammonia tanks), ~~D209,~~ D210 (oil water separator)]

Verification: The project owner shall submit to the CPM documentation that the BACT/LAER determination was reviewed by the ~~SCAQMD~~ **South Coast AQMD** prior to the commencement of construction of Phase II. The documentation shall include any modifications to the BACT/LAER determination made by the ~~SCAQMD~~ **South Coast AQMD**. Any modification to the BACT/LAER determination shall be submitted to the Energy Commission compliance project manager as an amendment request.

AQ-E15 Notwithstanding the requirements of Section E conditions, the project owner may commence the construction of Phase II of this project if all the following condition(s) are met:

Rule 1325 compliance for the Phase II of this project shall be reviewed and required by South Coast AQMD as appropriate prior to the commencement of construction of Phase II of the project. [Rule 1325]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle), C187, C188, C193, C194, C200, C205, C206 (simple-cycle control), C183 (auxiliary boiler control) D164 (ammonia tank), D209, D210 (oil water separator)]

Verification: The project owner shall submit to the CPM documentation that compliance with South Coast AQMD Rule 1325 Federal New Source Review for PM2.5 was reviewed and approved by the South Coast AQMD prior to the commencement of construction of Phase II.

Applicable Rules

AQ-H1 This equipment is subject to the applicable requirements of the following Rules or Regulations:

Contaminant	Rule	Rule/Subpart
CO	South Coast AQMD Rule	1146
NOx	South Coast AQMD Rule	1146
NOx	South Coast AQMD Rule	1100

RULE 1100, 1146]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall make the site available for inspection by representatives of the South Coast AQMD, ARB, U.S. EPA and the Energy Commission.

Administrative

AQ-I1 This equipment shall not be operated unless the facility holds ~~108,377~~ **112,607** pounds of NOx RTCs in its allocation account to offset the annual emissions increase for the first year of operation. RTCs held to satisfy this condition may be transferred only after one year from the initial start of operation. If the hold amount is partially satisfied by holding RTCs that expire midway through the hold period, those RTCs may be transferred upon their respective expiration dates. This hold amount is in addition to any other amount of RTCs required to be held under other condition(s) stated in this permit.

[RULE 2005]

[Devices subject to this condition: D165, D173 (combined-cycle)]

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations to demonstrate compliance with this condition as part of the 4th quarter Quarterly Operational Report required in **AQ-SC7**.

AQ-I2 This equipment shall not be operated unless the facility holds ~~68,575~~ **21,322** pounds of NOx RTCs in its allocation account to offset the annual emissions increase for the first year of operation. RTCs held to satisfy this condition may be transferred only after one year from the initial start of operation. If the hold amount is partially satisfied by holding RTCs that expire midway through the hold period, those RTCs may be transferred upon their respective expiration dates. This hold amount is in addition to any other amount of RTCs required to be held under other condition(s) stated in this permit.

[RULE 2005]

[Devices subject to this condition: D185, D191, D197, D203 (simple-cycle)]

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations to demonstrate compliance with this condition as part of the 4th quarter Quarterly Operational Report required in **AQ-SC7**.

AQ-I3 This equipment shall not be operated unless the facility holds 1,351 pounds of NOx RTCs in its allocation account to offset the annual emissions increase for the first year of operation. RTCs held to satisfy this condition may be transferred only after one year from the initial start of operation. If the hold amount is partially satisfied by holding RTCs that expire midway through the hold period, those RTCs may be transferred upon their respective expiration dates. This hold amount is in addition to any other amount of RTCs required to be held under other condition(s) stated in this permit.

[RULE 2005]

[Devices subject to this condition: D181 (auxiliary boiler)]

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations to demonstrate compliance with this condition as part of the 4th quarter Quarterly Operational Report required in **AQ-SC7**.

Record Keeping Reporting

AQ-K1 The project owner shall provide to the South Coast AQMD a source test report in accordance with the following requirements:

Source test results shall be submitted to the South Coast AQMD no later than 90 days after the source tests required by conditions D29.5 (AQ-D13) and D29.5 (**AQ-D12**), are conducted.

Emission data shall be expressed in terms of concentration (ppmv), corrected to 15 percent oxygen (dry basis), mass rate (lbs/hr), lbs/MM cubic feet, and lbs/MMBtu. In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains per DSCF.

All exhaust flow rates shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute (DACFM).

All moisture concentration shall be expressed in terms of percent corrected to 15 percent oxygen.

Source test results shall also include the oxygen levels in the exhaust, the fuel flow rate (CFH), the flue gas temperature, and the generator power output (MW) under which the test was conducted.

[RULE 1303(a)(1)-BACT, RULE 1303(b)(2)-Offset, RULE 1703(a)(2) – PSD-BACT, RULE 2005]

[Devices subject to this condition: D165, D173 (combined-cycle), D185, D191, D197, D203 (simple-cycle)

Verification: The project owner shall submit the source test results no later than 90 days following the source test date to both the South Coast AQMD and CPM.

AQ-K2 The project owner shall provide to the ~~District~~ **South Coast AQMD** a source test report in accordance with the following requirements:

Source test results shall be submitted to the ~~District~~ **South Coast AQMD** no later than 90 days after the source tests required by conditions D29.5 (**AQ-D13**), D29.6 (**AQ-D14**), and D29.4 (**AQ-D12**), are conducted.

Emission data shall be expressed in terms of concentration (ppmv), corrected to 3 percent oxygen (dry basis), mass rate (lbs/hr), lbs/MM cubic feet, and lbs/MMBtu. In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains per DSCF.

All moisture concentration shall be expressed in terms of percent corrected to 3 percent oxygen.

Source test results shall also include, for each firing rate, the following operating data: (1) the exhaust flow rates, in actual cubic feet per minute (acfm), (2) the firing rates in Btu/hour, (3) the exhaust temperature, in degrees Fahrenheit, (4) the oxygen content of the exhaust gases, in percent, and (5) the fuel flow rate.

[RULE 1146, RULE 1303(a)(1)-BACT, RULE 1303(b)(2)-Offset, RULE 1703(a)(2) – PSD-BACT, RULE 2005]

[Devices subject to this condition: D181]]

Verification: The project owner shall submit the source test results no later than 90 days following the source test date to both the ~~District~~ **South Coast AQMD** and CPM.

REFERENCES

AES 2019 – Alamitos Energy Center –AR+EC Petition to Amend Operational Changes (TN 227497), Docket Date: April 18, 2019

AES 2020 – Alamitos Energy Center –AEC Petition to Amend Operational Changes (TN 232860), Docket Date: April 24, 2020

AES 2019c – Alamitos Energy Center –Alamitos Energy Center Response to Data Request 1 (TN 229155), Docket Date: July 31, 2019

ARB 2019a – California Air Resources Board. Air Designation Maps available on ARB website. http://www.arb.ca.gov/desig/adm/adm.htm. Accessed December 3, 2019

ARB 2019b – California Air Resources Board. California Ambient Air Quality Data Standards available on ARB website. http://www.arb.ca.gov/research/aaqs/aaqs.htm. Accessed December 3, 2019

CEC 2017 – California Energy Commission – Final Commission Decision (TN 217416), Docket Date: May 4, 2017

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SCAQMD 2019 – South Coast Air Quality Management District – Application Processing and Calculations Auxiliary Boilr & Auxiliary Boiler SCR—Condition Changes to Permits to Construct (TN 229156) Docket Date: July 31, 2019

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SCAQMD 2020a – South Coast Air Quality Management District – Application Processing and Calculations Combined-Cycle Turbines Non-Cold Start Emissions Increase (Included in AES 2020 TN 232860) Issue Date: April 7, 2020

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U.S. EPA 2019b – United States Environmental Protection Agency. National Ambient Air Quality Data Standards available on U.S. EPA website. https://www.epa.gov/criteria-air-pollutants/naaqs-table. Accessed December 2019