Evaluation for
Renewal of the Authority to Construct
for the
Oakley Generating Station
Plant Number 19771

Bay Area Air Quality Management District

Authority to Construct Number 20798

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I. Introduction and Summary

Contra Costa Generating Station, LLC has requested a renewal of the Authority to Construct for the Oakley Generating Station. The Oakley Generating Station is a proposed combined-cycle 624-megawatt natural gas-fired electric power generation facility that will be located at 5950 Bridgehead Road in Oakley, CA. The California Energy Commission (CEC) licensed the facility on May 18, 2011, and the District subsequently issued the Authority to Construct on June 2, 2011,[1] with a two-year term. The two-tear term has expired, and the applicant has requested the Authority to Construct be renewed for another two years.[2]

Renewal of the Authority to Construct is subject to District Regulation 2-1-407.1, which provides that an Authority to Construct may be renewed for an additional two years upon a showing that the project will meet current Best Available Control Technology (BACT) and offset requirements as defined in District Regulations 2-2-301, -302, and -303. This document provides the District's evaluation of the project's compliance with the current BACT and offset requirements in accordance with Regulation 2-1-407.1 as a prerequisite for renewal of the Authority to Construct.

The District's review of current BACT and offsets as described herein has found that the BACT and offset conditions established for the CEC license and Authority to Construct meet current standards. After a description of the project in Section II, the District's BACT review is set forth in detail in Section III. Offsets are discussed in Section IV. Procedural requirements for Authority to Construct renewal and related issues are discussed in Section V. Section VI states the District's conclusion that based on all of this analysis it is renewing the Authority to Construct for this facility. (For ease of reference, the permit conditions contained in the Authority to Construct are listed in Appendix A.)

[1] BAAQMD Application No. 20798.

[2] *See* Letter dated April 4, 2013, from J. McLucas to K. Truesdell regarding Oakley Generating Station – Plant No. 19771, Application No. 20798; Compliance with Regulation 2-1-407.

II. Project Description

The Oakley Generating Station will be a combined-cycle intermediate-to-baseload power plant that uses a state-of-the-art "Rapid Response" design for fast startups. This design means that the facility will be able to operate efficiently both to meet contractual load and spot-sale demand for shaping or load-following generation, and on a full-time, base-loaded basis. As a combined-cycle facility, the project will use Heat Recovery Steam Generators (HRSGs) to recover waste heat in the exhaust gases to make steam to generate additional power, increasing the plant's overall efficiency. This highly efficient design will allow the facility to operate efficiently when needed full-time in a base-loaded mode. In addition, the project's "Rapid Response" design will allow fast startups, so that it can provide power to the grid quickly. The facility will thus provide energy-efficient electric generation capacity using new conventional generation technology, with operational flexibility to efficiently address grid fluctuations due to the intermittent nature of renewable generation such as wind and solar.

The Oakley Generating Station will consist of the following permitted equipment:

S-1 Gas Turbine Generator #1, GE Frame 7FA, Natural Gas-Fired, 213 MW, 2150 MMBtu/hr (HHV) maximum rated capacity with high-efficiency inlet air filter; abated by A-1 Selective Catalytic Reduction System (SCR) and A-2 Oxidation Catalyst

S-2 Gas Turbine Generator #2, GE Frame 7FA, Natural Gas-Fired, 213 MW, 2150 MMBtu/hr (HHV) maximum rated capacity with high-efficiency inlet air filter; abated by A-3 Selective Catalytic Reduction System (SCR) and A-4 Oxidation Catalyst

S-3 Auxiliary Boiler, Natural Gas-Fired, 50.6 MMBtu/hr maximum rated capacity (abated by A-5 Oxidation Catalyst if required)

S-4 Fire Pump Diesel Engine, Clarke JW6H-UFAD80 (or equivalent), 400 hp, 2.78 MMBtu/hr maximum rated heat input

The facility will also have the following exempt equipment:

S-5 Evaporative Fluid Cooler, 3-Cell, 5,880 gallons per minute (Exempt from District Permit requirements per Regulation 2, Rule 1, Section 128.4)

S-6 Oil-Water Separator, 120 gallons per hour (Exempt from District Permit requirements per Regulation 2, Rule 1, Section 103 and Regulation 8, Rule 8, Section 113)

The CEC issued its license for the project on May 18, 2011,[3] and the District issued its Authority to Construct for the project on June 2, 2011. Further information regarding this project, including a more detailed project description, is presented in the Determination of Compliance that the District prepared for the project,[4] as well as in additional documentation prepared in connection with the CEC's licensing proceeding.[5]

[3] *See* Oakley Generating Station Commission Decision, CEC-800-2011-002-CMF, May 2011 (available at: www.energy.ca.gov/2011publications/CEC-800-2011-002/CEC-800-2011-002-CMF.pdf) .

[4] Final Determination of Compliance, Oakley Generating Station, Bay Area Air Quality Management District Application 20798, January 2011 at pp. 30-32. (available at: www.baaqmd.gov/~/media/Files/Engineering/Public%20Notices/2011/20798/Oakley%20FDOC%20January%202011.ashx?la=en), referred to hereinafter as "FDOC".

[5] The CEC's docket for its licensing proceeding for this project, Docket No. 09-AFC-4, is available electronically at www.energy.ca.gov/sitingcases/oakley/index.html.

III. Best Available Control Technology (BACT) Review

The first requirement for renewal of an Authority to Construct under District Regulation 2-1-407.1.2 is that the facility must meet current Best Available Control Technology (BACT) requirements under District Regulation 2-2-301. District Regulation 2-2-301 requires that the Oakley Generating Station use the Best Available Control Technology to control NO_x, CO, POC, PM_{10}, and SO_x emissions from the gas turbines and to control NO_x and CO from the fire pump diesel engine, because these sources will have the potential to emit over 10 pounds per day of each of those pollutants. Pursuant to Regulation 2-2-206, BACT is defined as the more stringent of:

(a) The most effective control device or technique which has been successfully utilized for the type of equipment comprising such a source; or

(b) The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source; or

(c) Any emission control device or technique determined to be technologically feasible and cost-effective by the APCO; or

(d) The most effective emission control limitation for the type of equipment comprising such a source which the EPA states, prior to or during the public comment period, is contained in an approved implementation plan of any state, unless the applicant demonstrates to the satisfaction of the APCO that such limitations are not achievable. Under no circumstances shall the emission control required be less stringent than the emission control required by any applicable provision of federal, state or District laws, rules or regulations.

The type of BACT described in definitions (a) and (b) must have been demonstrated in practice and is referred to as "BACT 2". This type of BACT is termed "achieved in practice". The BACT category described in definition (c) is referred to as "technologically feasible/cost-effective" and it must be commercially available, demonstrated to be effective and reliable on a full-scale unit, and shown to be cost-effective on the basis of dollars per ton of pollutant abated. This is referred to as "BACT 1". BACT specifications (for both the "achieved in practice" and "technologically feasible/cost-effective" categories) for various source categories have been compiled in the BAAQMD BACT Workbook.

The District conducted a thorough BACT review for the Oakley Generating Station in its Determination of Compliance for the project, which is a regulatory evaluation that the District prepares pursuant to District Regulation 2, Rule 3, for the CEC to use in its licensing process for new power plants. Based on this review, the District recommended BACT permit conditions to the CEC for inclusion in the facility's CEC license. The CEC included these BACT conditions in its license, and the District subsequently included the BACT conditions in the Authority to

Construct it issued based on the CEC's license. In connection with the Applicant's request to renew the Authority to Construct, the District has reviewed the project under Regulation 2-1-407.1.2 to determine whether it meets current BACT standards. The results of the District's BACT review are described in the following subsections. The following analyses incorporate by reference the prior BACT review set forth in the January 2011 Final Determination of Compliance (FDOC),[6] as augmented and updated by the further review and analysis the District has conducted in connection with the renewal request.

III.A. BACT for the Gas Turbines

The following section provides the District's review of current BACT standards applicable to the project's gas turbines.

III.A.1 Nitrogen Oxides (NO_x)

In the 2011 FDOC, the District determined that the Best Available Control Technology for controlling NOx emissions from the Oakley Generating Station gas turbines is the use of dry-low NO_x combustors to help minimize the formation of NO_x during combustion, along with a Selective Catalytic Reduction (SCR) system to control NOx in the exhaust stream. The District determined that the appropriate corresponding BACT emission limit for NO_x for turbines using these technologies was a limit of 2.0 ppmvd @ 15% O_2, averaged over one hour.[7] This BACT determination for NOx was incorporated into the CEC's license conditions and the conditions of the District's Authority to Construct. The District has reviewed this BACT determination and found that it continues to meet current BACT standards.

- ***Consideration of NO_x Control Technologies:***

As detailed in the 2011 FDOC, the District evaluated a number of different control technologies that could be used to control NOx, including combustion controls (steam/water injection, dry low-NOx combustors, and catalytic combustors) and post-combustion controls (SCR, selective non-catalytic reduction (SNCR), and EMx™). The District determined that dry low-NOx combustors and SCR are the most effective control technologies that are available for this type of facility. The District has reviewed the available control technologies and has determined that these technologies continue to be the most effective control technologies available. There are no new or more-effective technologies that have been developed to control NOx that could be applied at this facility.

In particular, the District reviewed the status of EMx™, an add-on control technology (formerly known as SCONOx™) that could potentially provide certain benefits over SCR because it does

[6] *See* FDOC, *supra* note 4, Section 5, pp. 27-64.

[7] *See* FDOC, *supra* note 4, pp. 28-37.

not use ammonia. The District concluded in the FDOC that EMx™ was not an available technology for use at this facility for several reasons, including the fact that EMx™ had never been demonstrated on a large utility-scale turbine of the size that will be used at the Oakley Generating Station, and the fact that there were significant concerns that EMx would not be able to perform well on such larger turbines. As explained in the FDOC, the largest gas turbine on which EMx™ had been installed was a 45 MW aeroderivative turbine, a Siemens Model SGT 800 Gas Turbine (508 MMBtu/hr) located at Unit 6 at the Redding Power Plant. That turbine was permitted at with a "demonstration" emissions limit of 2.0 ppm, similar to what SCR can consistently achieve. But data from actual operation of the Redding Power Plant showed that the unit was not able to reliably and continuously meet this limit. These concerns about the difficultly EMx™ was having in achieving emissions as low as SCR can achieve, coupled with concerns that doing so could be even more difficult if EMx™ were to be scaled up for use in the larger turbines at the Oakley Generating Station, led the District to conclude that EMx™ was not an appropriate BACT technology for use on this project.[8]

The District has evaluated the development of this technology further to determine whether it has become an available technology that the District should require as BACT. As of 2013, EMx™ still has not been used on a utility-scale turbine, and the concerns about the ability of the system to be scaled up remain the same. Moreover, according to recent reports, the EMx™ unit installed at Redding Unit 6 has experienced performance problems, including some issues with dampeners ceasing operation in freezing temperatures;[9] and some issues meeting steam temperature and pressure requirements for startup, which required the facility to increase startup time from 2 hours to 4 hours.[10] Furthermore, even if the unit could consistently achieve its permitted 2.0 ppmvd NO_x limit, it is permitted with a CO limit of 4.0 ppmvd (1-hr).[11] Thus even if EMx™ could equal SCR in terms of NOx control, it has not been shown to match an SCR/CO catalyst combination's superior CO performance, which in this application will be able to achieve a CO permit limit of 2.0 ppmvd (1-hr).[12] For all of these reasons, the District continues to find that EMx™ is not appropriate to require as a BACT control technology for NOx because it has not been demonstrated to reliably and consistently achieve the high level of emissions control that

[8] *See* FDOC, *supra* note 4, at pp. 30-32. Note that the Redding Power Plant has two turbines equipped with EMx™, Unit 5 and Unit 6. The District's analysis has focused on the newer turbine, Unit 6, because it is the turbine permitted with the demonstration limit of 2.0 ppm NOx (1 hr. average), the same limit that the Oakley Generating Station will be able to achieve with SCR. Redding Unit 5 has a permitted limit of 2.5 ppm NOx (1 hr. average) for its EMx™ system, along with a 6.0 ppm CO limit (1 hr. average). Unit 5 therefore does not demonstrate that EMx™ has achieved in practice an emission reduction level as stringent as SCR.

[9] *See* Redding Electric Utility 40 CFR 60.7(d)(2) Compliance Certification dated April 24, 2013 at pp. 3-4.

[10] *See* Redding Electric Utility 40 CFR 60.7(d)(2) Compliance Certification dated July 12, 2012 at pp. 4-5, and Evaluation Report and Statement of the Legal and Factual Basis Regarding Proposed Modification of a Title V Operating Permit to City of Redding Redding Power Plant dated December 2012 at p. 5.

[11] *See* City of Redding, Redding Power Plant Title V Operating Permit, issued February 4, 2013 at p. 23.

[12] *See* CO discussion below, Section III.A.2.

SCR is capable of. The District has therefore concluded that SCR continues to be the current BACT technology for this project.

- ***Consideration of NO_x Emissions Limit:***

In the 2011 FDOC, the District determined that the most stringent BACT emission limit that could be achieved by the Oakley Generating Station turbines using the BACT control technologies outlined above was 2.0 ppmvd, averaged over one hour. This evaluation was based on (i) a review of other similar facilities[13] to determine the most stringent emissions limitation that has been achieved in practice and (ii) a review of whether an even more stringent emissions limitation could be technologically feasible and cost-effective.

To determine the most stringent emissions limitation that has been achieved in practice, the District reviewed NOx emissions limits from permits that have been issued for similar facilities. Table 9 in the FDOC identified 52 such permits. The most stringent NOx emissions limitation contained in any of those permits was 2.0 ppmvd averaged over one hour.[14] The District updated this research in evaluating the request for renewal of this Authority to Construct and found an additional 8 permits that were not identified in Table 9 of the FDOC, as listed in Table 1 below. None of these permits contains a NOx limit more stringent than 2.0 ppmvd, averaged over one hour. The District has therefore concluded that a NOx limit of 2.0 ppmvd, averaged over one hour, continues to be the most stringent emissions limitation that has been achieved in practice for any facility using turbines of this type.

[13] The District's review of other facilities is based on searches of EPA's RACT/BACT/LAER Clearinghouse (RBLC), ARB's BACT Clearinghouse, and the CEC's power plant project lists, as well as the District's own experience with permitting such projects.

[14] Note that the District's review identified one facility, the IDC Bellingham facility in Massachusetts, which was permitted with a two-tiered NOx emissions limit. The ultimate emissions limitation was an absolute not-to-exceed limit of 2.0 ppm, but the permit also contained a requirement that the facility maintain emissions below 1.5 ppm during normal operations. This two-tiered limit recognized that emissions can be highly variable depending on operating circumstances, and will have relatively lower emissions at some times and relatively higher emissions at other times. (Indeed, the Oakley Generating Station is expected to exhibit the same type of variation in emissions under the various operating scenarios it will face, and it is expected to have emissions below 2.0 ppm at times but will have emissions as high as 2.0 ppm under some circumstances.) Based on this analysis (as well as the fact that the facility was never actually built), the District concluded that the existence of this 1.5 ppm number in the IDC Bellingham permit did not establish that a 1.5 ppm NOx limit was achieved in practice or achievable consistently under all circumstances. *See* FDOC, *supra* note 4, at p. 34, note a to Table 9. There have been no changes in the situation with the IDC Bellingham permit since the District reviewed the situation in the FDOC.

TABLE 1: NO_x EMISSION LIMITS FOR LARGE GAS TURBINES IN COMBINED-CYCLE POWER PLANT PERMITS IDENTIFIED SINCE 2011 FDOC

Facility Name	RBLC ID or CEC Docket #	NOx ppmvd @ 15% O2 (averaging period)
Athens Generating Plant	NY-0098	2.0 (3-hr)
Sacramento Municipal Utility District	CA-0997	2.0 (1-hr) with excursion language
Carlsbad - NRG	2007-AFC-6	2.0 (1-hr); 2.0 (3-hr) transient load +/- 50 MW/min
Gateway - PG&E	2000-AFC-01	2.0 (1-hr)
City of Palmdale – Hybrid Gas-Solar	2008-AFC-9C/ EPA-R09-OAR-2011-0560-0055	2.0 (1-hr)
Warren County Power Plant[a]	VA-0315	2.0 (1-hr)
Mountainview Power Company, LLC	CA-1213/ 2000-AFC-02	2.0 (1-hr)
LADWP – Scattergood	SCAQMD permit	2.0 (1-hr)

Notes:

[a] The Warren County Power Plant permit (VA-0315) replaced two of the permits that were listed in Table 9 of the FDOC, CPV Warren (VA-0291) and Warren County Facility (VA-0308). The project was revised after those permits were issued and a new permit was issued. The new permit is therefore being included in this table. The NOx emissions limit in the Warren County Power Plant permit is the same as the NOx limit in the CPV Warren and Warren County Facility permits – 2.0 ppm NOx. Some of the other limits were changed slightly, however, as reflected in subsequent tables in this document.

In the 2011 FDOC, the District also considered whether it would be technologically feasible and cost-effective to implement a NO_x permit limit below the 2.0 ppm limit that has been achieved in practice at other facilities. The District concluded that requiring the facility to meet a limit below 2.0 ppm would not be feasible for multiple reasons, including (i) the fact that it becomes increasingly difficult to effectively reduce NOx as concentrations get very low and approach zero; (ii) the fact that equipment vendors who supply SCR systems cannot guarantee that such systems can continuously achieve NOx emissions performance below 2.0 ppm; (iii) the fact that there could be offsetting adverse environmental impacts from trying to force the BACT emissions limit below 2.0 ppm, including increased ammonia slip emissions, increased hazardous waste disposal from more frequent catalyst change-outs, decreased energy efficiency (and therefore more emissions per MW of power generated) because of increased backpressure from the SCR system, and impacts associated with additional maintenance downtime; and (iv) the fact that the concerns about achieving a lower emissions limit will be heightened for this facility, which will be required to respond to transient load conditions (i.e., sudden sharp

increases or decreases in demand) in order to support California's increasing renewable power infrastructure.[15]

The District reviewed this analysis to evaluate whether these conditions have changed and whether it would now be feasible to require a lower NOx limit. Based on this review, the District has determined that its conclusion that imposing a BACT NO_x limit below 2.0 ppm is not warranted is still valid. It remains difficult from an engineering perspective to design a system to remove more and more NOx as concentrations become very small. For these reasons, equipment vendors who supply SCR control systems are still unable to guarantee that SCR will be able to continuously achieve a lower limit.[16] Moreover, attempting to design a system to achieve a lower NO_x limit still raises the same concerns about other potential adverse environmental impacts such as higher ammonia slip emissions, decreased efficiency with a larger catalyst bed, more frequent catalyst replacements, and increased maintenance outages. And the concerns about maintaining a lower NO_x limit and a low ammonia slip while ramping quickly to support integration with renewable energy sources have not diminished since 2011, as California continues to move forward in implementing its aggressive renewable power generation goals.[17]

- ***Conclusion:***

Based on the foregoing review, the District has concluded that the NO_x limit of 2.0 ppmvd, averaged over one hour, in the CEC license and District's Authority to Construct meets current BACT.

III.A.2. Carbon Monoxide (CO)

In the 2011 FDOC, the District determined that the Best Available Control Technology for CO for the Oakley Generating Station gas turbines is the use of good combustion practice to reduce the formation of carbon monoxide during combustion and an oxidation catalyst to remove carbon monoxide from the turbines' exhaust. The District determined that the appropriate corresponding BACT emission limit for CO for turbines using these technologies was a CO emission concentration limit of 2.0 ppmvd @ 15% O_2, averaged over one hour.[18] This BACT determination for CO was incorporated into the CEC's license conditions and the conditions of the District's Authority to Construct. The District has reviewed this BACT determination and found that it continues to meet current BACT standards.

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[15] *See* FDOC, *supra* note 4, at pp. 34-37.

[16] *See* letter from Steve Brewer (Vice President Kiewit Power Group, Kiewit Power Engineers Co.) to K. Truesdell BAAQMD regarding Oakley Generating Station NOx Emission Concentration Limit dated May 22, 2013.

[17] *See* 2012 Integrated Energy Policy Report Update (IEPR), California Energy Commission CEC-100-2012-001-CMF at p. 64 (available at: http://energy.ca.gov/2012publications/CEC-100-2012-001/CEC-100-2012-001-CMF.pdf).

[18] *See* FDOC, *supra* note 4, at pp. 37-42.

- ***Consideration of CO Control Technologies:***

The 2011 FDOC found that good combustion practice was the only combustion control available to address CO formation during combustion. For post-combustion controls, the FDOC considered the use of an oxidation catalyst and also specifically considered EMx technology, which also works as an oxidation catalyst, but which is a multi-pollutant control technology that is also effective to control NOx (see further discussion above in the NOx analysis). Given that EMx had been ruled out as a BACT technology for reducing NOx, however, the FDOC rejected it as a potential BACT technology for CO. The FDOC therefore recommended good combustion practice and an oxidation catalyst as the appropriate BACT control technologies. The District has not found any new or more effective control devices or techniques that could appropriately be required as BACT for this project. The District has concluded that EMx continues to be less effective than SCR as a NOx control technology as described above in the NOx discussion. The District therefore continues to believe that it would not be appropriate to require it as BACT, leaving good combustion practice and an oxidation catalyst as the appropriate BACT technologies.

- ***Consideration of CO Emissions Limit:***

In the 2011 FDOC, the District determined that the most stringent BACT CO emission limit that could be achieved by the Oakley Generating Station turbines using the BACT control technologies outlined above was 2.0 ppmvd, averaged over one hour. This evaluation was based on (i) a review of other similar facilities to determine the most stringent emissions limitation that has been achieved in practice and (ii) a review of whether an even more stringent emissions limitation could be technologically feasible and cost-effective.

To determine the most stringent emissions limitation that has been achieved in practice, the District reviewed CO emissions limits from permits that have been issued for similar facilities. Table 10 in the FDOC identified 51 such permits. Based on a review of these facilities, the District determined that the most stringent CO emissions limitation that any facility had actually achieved in practice was 2.0 ppmvd averaged over one hour. The District noted that there were two permits that had been issued with CO limits of less than 2.0 ppm – the Warren County facility and the Kleen Energy Systems facility – but that these facilities had not yet been built and so there was no data available to determine whether the facilities were actually able to achieve their permit limits in practice.[19]

In evaluating the request for renewal of this Authority to Construct, the District reviewed the status of the Warren County and the Kleen Energy Systems permits to see whether the situation has changed and whether those facilities now demonstrate that a CO emissions limit below 2.0 ppm has been achieved in practice. The Warren County Power Plant is under construction, so

[19] *See* FDOC, *supra* note 4, at p. 40.

there is still no operating data available on which to assess whether this facility will be able to meet its limit in practice. With respect to the Kleen Energy Systems facility, the facility began operation in May 2011. However, the facility's CO permit limit of 0.9 ppmvd, averaged over one hour, is applicable only during steady-state operation, which the permit defines as "operation of the turbine when the rate of change in load, with respect to time, is zero."[20] This limit specifically excludes any shifts between loads, and there is no additional limit that applies to CO during load changes. The exclusion of transient load operation from the low CO limit highlights the concern that facilities may not be able to meet a limit lower than 2.0 ppm during transient load, and therefore that such a limit should not be imposed as a not-to-exceed limit applicable during all periods of operation. These concerns are particularly strong for the gas turbines at the Oakley Generating Station, which will be required to operate frequently under transient load conditions with fast ramp rates that are expected as California continues to integrate renewable sources of electrical power such as wind and solar. The gas turbines to be installed at Oakley Generating Station will have a ramp rate up to 40 MW/min, according to GE, and will therefore have to comply with CO emissions limits under highly transient operating conditions.[21] The lower CO limit in the Kleen Energy Systems permit is limited to steady-state operating conditions only, and thus does not demonstrate that a not-to-exceed emissions limitation below 2.0 ppmvd, averaged over one hour, has been achieved in practice as a limit that must be continually complied with under all such operating conditions.

The District also updated its earlier research into CO emissions limitations that have been achieved in practice at other facilities as shown in Table 10 of the FDOC, and found an additional 5 permits that were not identified in the FDOC, as listed in Table 2 below.

TABLE 2: CO EMISSION LIMITS FOR LARGE GAS TURBINES IN COMBINED-CYCLE POWER PLANTS IDENTIFIED SINCE 2011 FDOC

Facility Name	RBLC ID or CEC Docket #	CO ppmvd @ 15% O2 (averaging period)
Carlsbad - NRG	2007-AFC-6	2.0 (1-hr); 2.0 (3-hr) transient load +/- 50 MW/min
Avenal Energy -Avenal Power Center, LLC	2008-AFC-1/ EPA-R09-OAR-2011-0559-0002	2.0 (3-hr)/ 2.0 (1-hr) changes to 1.5 (1-hr) after 3 year demonstration period
City of Palmdale – Hybrid Gas-Solar	2008-AFC-9C/ EPA-R09-OAR-2011-0560-0055	2.0 (3-hr)/ 2.0 (1-hr) changes to 1.5 (1-hr) after 3 year demonstration period

[20] *See* New Source Review Permit to Construct and Operate a Stationary Source, Connecticut Department of Energy & Environmental Protection, issued to Kleen Energy Systems, LLC, Town-Permit Numbers 104-0131 dated June 18, 2012 at pp. 5, 8-9.

[21] *See* Email from J. McLucas to K. Truesdell, subject RE: Oakley Generating Station – BACT Update, dated 5/8/13 and GE fact sheet for 7F 5-Series Gas Turbine, Product of GE's FlexEfficiency Portfolio 2012 (available at: www.ge-flexibility.com/static/global-multimedia/flexibility/documents/7F_5-series_Gas_Turbine_Fact_Sheet_FINAL.pdf).

Facility Name	RBLC ID or CEC Docket #	CO ppmvd @ 15% O2 (averaging period)
LADWP – Scattergood	SCAQMD permit	2.0 (1-hr)
Warren County Power Plant[a]	VA-0315	1.5 (1-hr) without duct firing; 2.4 (1-hr) with duct firing

Notes:

[a] As discussed above in the notes to Table 1, the Warren County Power Plant permit (VA-0315) replaced two of the permits that were listed in Table 10 of the FDOC, CPV Warren (VA-0291) and Warren County Facility (VA-0308), and it is therefore being included in this table. The permits listed previously had CO limits of 1.3 ppm and 1.8 ppm without duct firing, and 1.2-2.5 ppm with duct firing. As shown in Table 2, the new permit has CO limits of 1.5 ppm without duct firing and 2.4 with duct firing. The Warren County Power Plant is currently under construction and there are no operating data to determine whether it will be able to meet these limits.

None of these facilities has an achieved-in-practice CO emissions limitation below 2.0 ppm. In particular, the District reviewed the permits for the Avenal Energy and City of Palmdale power plants, which have initial CO limits of 2.0 ppm, which will subsequently be lowered to 1.5 ppmvd, averaged over one hour, after a 3-year demonstration period unless the facility demonstrates that this lower level is not feasible.[22] Neither of these facilities has begun construction, and therefore they have no operating data from which to determine whether they can actually achieve emissions below 2.0 ppm. Moreover, the permit conditions' phased approach recognizes that a limit lower than the achieved-in-practice limit of 2.0 ppmvd, averaged over one hour, may not actually be achievable in practice. In addition, where a limit has simply been included in a permit, but the facility had not been built and emissions have not been verified as being in compliance with the limits, the limits are not "achieved in practice" for purposes of the District BACT requirement. As for the Warren County Power Plant, as discussed above that facility is still under construction, so there is no is still operating data available on which to assess whether this facility will be able to meet its limit. The District has therefore concluded that the most stringent CO emissions limitation that has been achieved in practice for this type of facility continues to be 2.0 ppmvd, averaged over one hour.

The District also considered whether it would be technically feasible and cost-effective to require the gas turbines at the Oakley Generating Station to meet an emissions limit below the 2.0 ppm achieved for similar combined-cycle facilities. The District conducted this "BACT 1" analysis in the FDOC, and found that using a larger oxidation catalyst could potentially be capable of meeting a CO permit limit below 2 ppm (although it found that doing so could have additional implementation problems such as high back-pressure, which could adversely impact turbine

[22] *See* Amended Prevention of Significant Deterioration Permit Issued Pursuant to the Requirements at 40 CFR 52.21, U.S. Environmental Protection Agency, Region IX, PSD Permit Number SJ 08-01, Avenal Energy Project dated 6/21/11 at pp. 7-8. (available at: www.regulations.gov/#!documentDetail;D=EPA-R09-OAR-2011-0559-0001) and Prevention of Significant Deterioration Permit Issued Pursuant to the Requirements at 40 CFR 52.21, U.S. Environmental Protection Agency, Region IX, PSD Permit Number SE 09-01, Palmdale Hybrid Power Project dated 10/18/11 at pp. 8-10. www.regulations.gov/#!documentDetail;D=EPA-R09-OAR-2011-0560-0055

operating performance and efficiency). But the District also found that even if achieving a limit below 2.0 would be technically feasible, it would not be cost-effective to do so under the District's BACT cost-effectiveness guidelines given the large costs involved.[23] In evaluating the request for renewal of the Authority to Construct, the District reviewed updated information on the costs and emissions reduction benefits of installing a larger oxidation catalyst capable of consistently maintaining CO emissions below a permit limit of 0.9 ppm. Based on these analyses, the cost of achieving a 0.9 ppm permit limit would be an additional $184,961 per year (above what it would cost to achieve a 2.0 ppm limit), and the additional reduction in CO emissions would be approximately 22.04 tons per year, making an incremental cost-effectiveness value of over $8,394 per ton of additional CO reduced.[24] Moreover, the total cost of achieving a 0.9 ppm CO limit (as opposed to the incremental costs of going from 2.0 ppm to 0.9 ppm) would be over $548,081 per year, and the total emission reductions from 9.0 ppm from the turbine to a 0.9 ppm limit would be 122.94 tons per year, resulting in a total (or "average") cost effectiveness value of $4,458. Based on these costs (on a per-ton basis) and the relatively little additional CO emissions benefit to be achieved (on a per-dollar basis), requiring a 0.9 ppm CO permit limit cannot reasonably be justified as a BACT limit. Requiring controls to meet a 0.9 ppm limit would be more expensive, on a per-ton basis, than what other similar facilities are required to achieve. The District has not adopted its own cost-effectiveness guidelines for CO,[25] but a review of guidelines adopted by other districts in California and of BACT determinations made by agencies around the country found that additional CO controls are not normally required where the cost per ton exceeds a few hundred to a few thousand dollars per ton.[26] Additional CO reductions here would not be justified as BACT given these costs.

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[23] *See* FDOC, *supra* note 4, pp. 40-41.

[24] *See* OGS Cost effectiveness spreadsheet 2013-05, prepared by K. Truesdell BAAQMD, and Radback-Energy-Oakley-BASF-042213-CO-R2.pdf, prepared by BASF, and BACT-CO-Control-Cost Case 1 051713.xlsx, BACT-CO-Control-Cost Case 2 051713.xlsx, BACT-CO-Control-Cost Case 1 and 2 051713.xlsx, prepared by J. McLucas, Radback Energy.

[25] Bay Area Air Quality Management District Best Available Control Technology (BACT) Guideline, § 1, Policy and Implementation Procedure, available at: http://hank.baaqmd.gov/pmt/bactworkbook/default.htm.

[26] *See* South Coast Air Quality Management District, Best Available Control Technology Guidelines, August 17, 2000, revised July 14, 2006, at 29; available at: www.aqmd.gov/bact/BACTGuidelines2006-7-14.pdf; Memorandum, David Warner, Director of Permit Services, to Permit Services Staff, Subject: "Revised BACT Cost Effectiveness Thresholds", May 14, 2008; available at: www.valleyair.org/busind/pto/bact/May%202008%20updates%20to%20BACT%20cost%20effectiveness%20thresholds.pdf; U.S. EPA RACT/BACT/LAER Clearinghouse Identification No. GA-0127, for permit issued to Southern Company/Georgia Power, Plant McDonough Combined Cycle, Permit No. 4911-067-0003-V-02-2, issued January 7, 2008; U.S. EPA RACT/BACT/LAER Clearinghouse Identification No. NV-0035, for permit issued to Sierra Pacific Power Company Tracey Substation Expansion Project, Permit No. AP4911-1504, issued August 16, 2005; U.S. EPA RACT/BACT/LAER Clearinghouse Identification No. OR-0041, Wanapa Energy Center, Permit No. R10PSD-OR-05-01, August 8, 2005; BAAQMD Application No. 15487, Russell City Energy Center, Responses to Public Comments (Feb. 3, 2010), pp. 69-74; EPA Region 4, "National Combustion Turbine List," available at: www.epa.gov/region4/air/permits/national_ct_list.xls.

Based on the foregoing analysis, the District has concluded that the CO limit of 2.0 ppmvd, averaged over one hour, in the CEC license and District's Authority to Construct meets current BACT.

III.A.3. Precursor Organic Compounds (POC)

In the 2011 FDOC, the District determined that the Best Available Control Technology for POC for the Oakley Generating Station gas turbines is the use of good combustion practice to reduce the formation of POC during combustion and an oxidation catalyst to remove POC from the turbines' exhaust (i.e., the same control technologies that constitute BACT for CO). The District determined that the most stringent level of POC emissions control that could be achieved by turbines using these technologies was a POC emissions concentration of 1.0 ppmvd @ 15% O_2. The District therefore determined that the appropriate BACT permit limit for the turbines was 2.71 lb/hr, the mass emissions limit corresponding to the BACT emissions concentration of 1.0 ppmvd.[27] This BACT determination for POC was incorporated into the CEC's license conditions and the conditions of the District's Authority to Construct. The District has reviewed this BACT determination and found that this limit meets current BACT.

- ***Consideration of POC Control Technologies:***

The 2011 FDOC determined that the same control technologies that are applicable for controlling CO emissions are the available control technologies for controlling POC emissions. Based on the analysis discussed above in relation to CO emissions, the FDOC determined that good combustion practice and an oxidation catalyst are the appropriate BACT control technologies for this facility. The District reviewed this analysis in response to the request for renewal of the Authority to Construct and has not found any new or more effective control devices or techniques for POC. As with CO, good combustion practice and an oxidation catalyst continue to be the appropriate BACT technologies for controlling POC.

- ***Consideration of POC Emissions Limit:***

In the 2011 FDOC, the District determined that the most stringent level of POC emissions that could be achieved by the Oakley Generating Station turbines using the BACT control technologies outlined above was 1.0 ppmvd, averaged over one hour. This evaluation was based on (i) a review of other similar facilities to determine the most stringent emissions limitation that has been achieved in practice, and (ii) a review of whether an even more stringent emissions limitation could be technologically feasible and cost-effective.

To determine the most stringent emissions limitation that has been achieved in practice, the District reviewed POC emissions limits from permits that have been issued for similar facilities. Table 11 in the FDOC identified 36 such permits. Based on a review of these facilities, the

[27] *See* FDOC, *supra* note 4, pp. 42-44.

District determined that the most stringent POC emissions limitation that any facility had actually achieved in practice was 1.0 ppmvd averaged over one hour. The District did note that there were two permits that had been issued with POC limits that were (nominally, at least) less than 2.0 ppm: (i) the Warren County facility in Virginia, discussed above in connection with the CO BACT analysis, which was permitted with a POC emissions rate of 0.7 ppm when operating without duct firing (and 1.0/1.4 ppm with duct firing); and (ii) the La Paloma facility near McKittrick in Kern County, which was permitted with a POC emissions rate of 0.7 ppm averaged over 3 hours and measured as propane. But with respect to the Warren County facility, the plant had not yet been built (as noted above) and so there was no data available to determine whether it was actually able to achieve this permit limit in practice. And with respect to the La Paloma facility, although the permit limit included a headline emissions limitation number of 0.7 ppm, the limit was measured as propane and using a 3-hour averaging period, both of which make it less stringent than the District's BACT determination of 1.0 ppm averaged over one hour and measured as methane. The District therefore concluded that these permits did not establish that a POC emissions limitation less than 1.0 ppm had been achieved in practice.[28]

In evaluating the request for renewal of this Authority to Construct, the District reviewed the current status of the Warren County facility.[29] As noted above, the Warren County Power Plant is under construction, so there is still no operating data available on which to assess whether this facility will be able to meet its limit. The District also updated its earlier research into POC emissions limitations at other facilities as shown in Table 11 of the FDOC, and found an additional 5 facilities that were not identified in the FDOC, as listed in Table 3 below.

TABLE 3: POC EMISSION LIMITS FOR LARGE GAS TURBINES IN COMBINED-CYCLE POWER PLANTS IDENTIFIED SINCE 2011 FDOC

Facility Name	RBLC ID or CEC Docket #	VOC ppmvd @ 15% O2 (averaging period)
Athens Generating Plant	NY-0098	4.0 (3-hr)
El Segundo Repower – NRG	2000-AFC-14	2.0 (1-hr)
LADWP – Scattergood	SCAQMD permit	2.0 (1-hr)
Carlsbad - NRG	2007-AFC-6	1.5 (1-hr); 1.5 (3-hr) transient load +/- 50 MW/min
Warren County Power Plant[a]	VA-0315	0.7 (3-hr) without duct firing; 1.6 (3-hr) with duct firing

Notes:

[a] As discussed above in the notes to Table 1, the Warren County Power Plant permit (VA-0315) replaced two of the permits that were listed in Table 11 of the FDOC, CPV Warren (VA-0291) and Warren County Facility (VA-0308), and it is therefore being included in this table. The permits listed previously had POC

[28] *See* FDOC, *supra* note 4, at pp. 42-44.

[29] The reasons why the La Paloma permit limit is actually less stringent than the Authority to Construct's 1.0 ppm limit, averaged over 1 hour and measured as methane, remain the same.

limits of 0.7 ppm without duct firing, 1.0 ppm with duct firing, and 1.4 ppm with duct firing and power augmentation. As shown in Table 3, the new permit has POC limits of 0.7 ppm without duct firing and 1.6 ppm with duct firing. The Warren County Power Plant is currently under construction and there are no operating data to determine whether it will be able to meet these revised limits.

As Table 3 shows, there have been no other facilities that have been identified since the 2011 FDOC with POC emissions limitations lower than 1.0 ppm (with the exception of the Warren County Power Plant, which as discussed above is still under construction and has not established that it can achieve a lower limit in practice). Indeed, most of the permits listed in Table 3 actually have POC emissions limitations well above 1.0 ppm. The District has therefore concluded that 1.0 ppm continues to be the most stringent emissions limitation that has actually been achieved in practice.

The District also considered in the 2011 FDOC whether it would be technologically feasible and cost-effective to impose a POC limit below 1.0 ppm. The District considered whether, assuming it would be technologically feasible to achieve a limit of 0.7 ppm (the number used in the Warren County permit), it would be cost-effective to do. Based on a detailed cost analysis, the District concluded that it would not be cost-effective. In evaluating the request for renewal of this Authority to Construct, the District reviewed this analysis using current cost estimates. The District calculated the cost-effectiveness of installing a larger oxidation catalyst designed to maintain POC emissions below 0.7 ppm (1 hour average).[30] Based on the costs and emissions-reduction benefits of these analyses, the cost of achieving a 0.7 ppm permit limit would be an additional $184,961 per year (above what it would cost to achieve a 1.0 ppm limit), and the additional reduction in POC emissions would be approximately 3.29 tons per year, making an incremental cost-effectiveness value of $56,299 per ton of additional POC reduction. Moreover, the total cost of achieving a 0.7 ppm POC limit (as opposed to the incremental costs of going from 1.0 ppm to 0.7 ppm) would be over $548,081 per year, and the total emission reductions from 1.4 ppm from the turbine to a 0.7 ppm limit would be 6.16 tons per year, resulting in a total (or "average") cost-effectiveness value of $88,992 per ton. The District has adopted guidelines that establish that the maximum cost that the District will require a facility to reduce POC emissions under the BACT 1 requirement is $17,500 per ton.[31] Based on the high costs (on a per-ton basis) and the relatively little additional POC emissions benefit to be achieved (on a per-dollar basis), requiring a 0.7 ppm POC permit limit cannot reasonably be justified as a BACT limit. Requiring controls to meet a 0.7 ppm limit would be substantially more expensive, on a per-ton basis, than what other similar facilities are required to achieve.

[30] *See* OGS Cost effectiveness spreadsheet 2013-05, prepared by K. Truesdell BAAQMD, and Radback-Energy-Oakley-BASF-042213-CO-R2.pdf, prepared by BASF, and BACT-CO-Control-Cost Case 1 051713.xlsx, BACT-CO-Control-Cost Case 2 051713.xlsx, BACT-CO-Control-Cost Case 1and 2 051713.xlsx, prepared by J. McLucas, Radback Energy.

[31] *See* Bay Area Air Quality Management District Best Available Control Technology (BACT) Guideline, § 1, Policy and Implementation Procedure, available at: http://hank.baaqmd.gov/pmt/bactworkbook/default.htm.

Based on the foregoing analysis, the District has determined that BACT for POC for the gas turbines at this facility continues to be the use of good combustion practice with abatement by an oxidation catalyst with a permit limit of 2.71 lb per hour, the mass emissions limit corresponding to 1.0 ppmvd @ 15% O_2. The POC emissions limitation in the CEC license and Authority to Construct therefore satisfies current BACT requirements.

III.A.4. Particulate Matter (PM)

In the 2011 FDOC, the District determined that the Best Available Control Technology for PM[32] for the Oakley Generating Station gas turbines is the use of a high efficiency inlet air filter, low-sulfur natural gas, and Dry Low-NO_x combustors with good combustion practice. This BACT determination for POC was incorporated into the CEC's license conditions and the conditions of the District's Authority to Construct. The District has reviewed this analysis and has determined that it continues to meet current BACT requirements.

The District's analysis in the 2011 FDOC reviewed the available control technologies for PM. It found that there was an available pre-combustion control technology, the use of an inlet air filter; and it found that there were three available combustion control devices/techniques, the use of good combustion practice, the use of low-sulfur clean-burning natural gas fuel, and the use of dry low-NOx combustors. The FDOC determined that all of these pre-combustion and combustion controls should be required as BACT. The FDOC also found that there were two post-combustion control technologies that can potentially be used to control PM emissions, electrostatic precipitators and baghouses, but it concluded that they were not appropriate BACT technologies for this facility because they had not been "achieved in practice" for use on natural-gas-fired turbines and are not technologically feasible/cost-effective for such use. Those technologies are effective primarily on PM emissions streams with a larger particle size and higher grain loading, such as sources that burn solid fuel. Attempting to use them on gas turbines would have little, if any, effect on reducing PM, and it would create significant back-pressure that would degrade the performance of the turbines and reduce their efficiency such that they would actually create more emissions per unit of power generated. These technologies' lack of effectiveness at achieving any significant reduction in PM emissions would also mean

[32] As noted in the FDOC (p. 45, fn. 36), the facility is subject to BACT requirements for PM_{10} only, not $PM_{2.5}$. That continues to be the case. The District adopted amendments to its permitting rules in December of 2012 that will add $PM_{2.5}$ BACT requirements to District Regulation 2, but those amendments have not yet taken effect. (And even when they do take effect, permit applications received before the effective date will continue to be evaluated under the pre-amendment rules.) $PM_{2.5}$ therefore continues to be subject to federal requirements under 40 C.F.R. Part 51, Appendix S, as discussed in the FDOC. This facility is not subject to any $PM_{2.5}$ requirements under Appendix S because its $PM_{2.5}$ emissions will be less than the Appendix S regulatory threshold of 100 tons per year. However, as noted in the FDOC, the facility's PM controls will be effective to control $PM_{2.5}$ emissions as well as PM_{10} emissions, as $PM_{2.5}$ is a subset of PM_{10}.

that they were not cost-effective, to the extent that they could even be feasibly used at all. For all of these reasons, the FDOC concluded that these additional add-on controls were not BACT.[33]

The District has reviewed this analysis and has determined that it has not changed. There are no new or more-effective control technologies that can feasibly be used to remove PM from the emissions stream. Add-on control devices such as electrostatic precipitators and baghouses continue to be inappropriate for use with natural-gas-fired turbines such as those that will be used at the Oakley Generating Station, and the District is not aware of any other facility that has ever used them in this type of application. The District has therefore determined that use of a high-efficiency inlet air filter and low-sulfur natural gas with good combustion practice are the current BACT control technologies for the proposed Oakley Generating Station.[34]

III.A.5. Sulfur Dioxide (SO_2)

In the 2011 FDOC, the District determined that the Best Available Control Technology for SO_2 for the Oakley Generating Station gas turbines is the use of clean-burning natural gas with a sulfur content not to exceed 1 gr/100 scf. The District also considered add-on controls such as flue gas desulfurization using wet scrubbers or dry scrubbers. But these technologies are typically installed on sources burning fuel with much higher sulfur contents, and the District found in the FDOC that they are not feasible for equipment such as the gas turbines here that will have a very low sulfur content it their exhaust. The FDOC therefore recommended that the appropriate BACT limit was the use of clean-burning natural gas with a sulfur content not to exceed 1 gr/100 scf,[35] and this limit was included in the CEC's license conditions and in the District's subsequent Authority to Construct.

The District reviewed this BACT analysis in evaluating the request for renewal of the Authority to Construct and found that it continues to satisfy current BACT standards. The standards for sulfur content in natural gas have not changed, there are no new or more-effective control technologies that can feasibly be used to remove SO_2 from the emissions stream, and the District has not found any other similar facilities that are using any better technologies. The District has therefore determined that current BACT for SO_2 for the gas turbines is the exclusive use of the highest quality commercially available natural gas that meets the PG&E Gas Rule 21, Section C standard of less than 1.0 grains of sulfur per 100 scf.

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[33] *See* FDOC, *supra* note 4, pp. 46-49, for further discussion.

[34] For low-sulfur fuel, the highest quality commercially available natural gas is natural gas that meets the PG&E Gas Rule 21, Section C standard of less than 1 grain of sulfur per 100 scf. The Authority to Construct specifies this fuel-sulfur-content limit as a BACT permit requirement (¶ 10), and it reflects PG&E's current standards. The District did not impose a numerical PM BACT emissions limit corresponding to this BACT technology because there is no add-on control equipment that the operator can use to control PM emissions. See discussion in FDOC, *supra* note 4, pp. 47-48. For the same reasons, the District is not imposing a numerical BACT limit for PM as part of the Authority to Construct renewal.

[35] *See* FDOC, *supra* note 4, pp. 48-49.

III.A.6. Startups and Shutdowns

In the 2011 FDOC, the District determined that the Best Available Control Technology for startups and shutdowns is best work practices with fast-start technology. The FDOC determined that the corresponding emissions limits listed in Table 4 below constituted BACT for startups and shutdowns.[36] These limits were included in the CEC's license conditions and in the District's subsequent Authority to Construct.

TABLE 4: BACT STARTUP AND SHUTDOWN LIMITS FOR OAKLEY GENERATING STATION

	Cold Startup	Hot/Warm Startup	Shutdown
NO_x (as NO_2) (lb/event)	96.3	22.3	39.3
CO (lb/event)	360.2	85.2	140.2
POC (as CH_4) (lb/event)	67.1	31.1	17.1
Duration (minutes/event)	90	30	30

The District's BACT determination was based on a determination that best work practices and fast-start technology were the only technologies available to reduce emissions during startups and shutdowns, along with a determination that the BACT limits for startup and shutdown modes were the most stringent that (i) have been achieved in practice or (ii) are technologically feasible and cost-effective. The District has reviewed this BACT determination in evaluating the request for renewal of the Authority to Construct and found that it continues to meet current BACT standards. There are no new or more effective technologies that have been developed since the 2011 FDOC for reducing emissions from startups and shutdowns, and there are no more stringent emissions limitations below the BACT limits listed in Table 4 that have been achieved in practice by other facilities and/or are feasible here.

With respect to the maximum level of emissions reduction achieved in practice by other facilities, in the 2011 FDOC the District compared these startup and shutdown limits with four other combined-cycle power plants that have been permitted using fast-start technologies, as listed in Table 13 of the FDOC. That review showed that there were no other facilities that had been permitted with startup and shutdown limits that were lower than the limits in Table 4 above, with one exception. That exception was a proposed CO limit in draft CEC license conditions for the Blythe Energy Project II. The Blythe II conditions for NOx for startups and shutdowns were higher than Oakley's, but the CO limits for startups and shutdowns were lower than the Oakley CO startup/shutdown limits.[37] The District concluded that these draft conditions did not mean

[36] *See* FDOC, *supra* note 4, pp. 49-56.

[37] The Blythe II permit conditions allow up to 111.6 pounds of NOx for a hot/warm startup and shutdown, compared with Oakley's 61 pounds; and up to 150.6 pounds of NOx for a cold startup and shutdown, compared with Oakley's 135 pounds. Oakley's limits are therefore more stringent with respect to NOx. For CO, however, the Blythe II permit limits are 83.8 pounds for a hot/warm startup and shutdown and 165.7 pounds for a cold startup and

that a lower CO limit was achieved in practice, however, for several reasons. These reasons included the fact that the facility had not been built and so there were no operating data from which to determine whether the facility could actually meet any such limits in practice; and the fact that there is an inherent trade-off between achieving additional CO reductions and achieving additional NOx reductions, and so even if the Blythe II draft limits were achievable, the District would prioritize achieving the lower NOx emissions under the Oakley limits over achieving the lower CO emissions in the Blythe II draft limits.[38]

The District reviewed the situation with the proposed Blythe Energy Project II in evaluating the application for renewal of the Authority to Construct and has determined that it has not materially changed. The facility has not yet been built, and so there is no operational data to demonstrate that these limits will actually be achievable in practice.[39] In addition, the Lodi Energy Center, another facility using a fast-start technology and the only similar fast-start plant in the country that is actually operating, has recently asked the CEC for an increase in its CO limits for startups and shutdowns.[40] This experience suggests that fast-start plants may in fact experience trouble in achieving their permitted CO emissions limits for startups and shutdowns when they actually begin operation, creating further questions about whether Blythe II will actually be able to achieve these very low CO emissions rates. And third, the District continues to prioritize NOx reductions over CO reductions because the Bay Area is currently in compliance with ambient CO standards but not in compliance with ambient ozone standards (NOx is an ozone precursor). For all of these reasons, the District continues to believe that the Blythe II project does not establish that any lower limits for startups and shutdowns have been achieved in practice.

In addition, the District also updated its research into other combined-cycle facilities using fast-start technology that have been permitted since the 2011 FDOC. In addition to the four plants identified in Table 13 of the FDOC, the District found one additional facility that has been permitted since then, the LADWP-Scattergood facility in Los Angeles.[41] The startup and shutdown emission permit limits are listed in Table 5 below. As shown in Table 5, there are no

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shutdown, compared with the Oakley limits of 225 pounds and 500 pounds, respectively. The Blythe II limits are therefore more stringent for CO.

[38] *See* FDOC, *supra* note 4, pp. 55-56.

[39] The CEC approved the revision to the Blythe II license that added these CO startup/shutdown limits in April of 2012, but the project is currently "on hold" according to the CEC's website. *See* http://www.energy.ca.gov/sitingcases/all_projects.html.

[40] *See* Petition to Amend Air Quality Conditions of Certification for the Lodi Energy Center Project (08-AFC-10C) prepared by Sierra Research, Inc. dated February 2, 2013. (available at: http://energy.ca.gov/sitingcases/lodi/compliance/2013-02-01_PTAmend_Air_Quality_Conditions.pdf).

[41] LADWP–Scattergood has an Authority to Construct from South Coast Air Quality Management District to install a 1x1 combined-cycle power block with a GE 7FA gas turbine (among other equipment and modifications). *See* Facility Permit to Operate LA city, DWP Scattergood Generating Stn, Facility ID 800075, Revision # 43, dated April 4, 2013 issued by South Coast Air Quality Management District.

permit limits for startups and shutdowns for that facility that are more stringent than the corresponding limits for the Oakley facility.

TABLE 5: COMPARISON OF STARTUP AND SHUTDOWN PERMIT LIMITS FOR OAKLEY GENERATING STATION AND LADWP–SCATTERGOOD

	Hot/Warm Startup + Shutdown				Cold Startup + Shutdown			
	NOx (lb/event)	CO (lb/event)	POC (lb/event)	Duration (mins)	NOx (lb/event)	CO (lb/event)	POC (lb/event)	Duration (mins)
Oakley	61	225	48	60	135	500	84	120
LADWP - Scattergood	75	no limit	no limit	113	136	no limit	no limit	191

With respect to reducing emissions from startups and shutdowns to the maximum extent feasible, the District conducted a thorough review in the FDOC of the various steps necessary to start up and shut down this equipment, and of the emissions that will be involved, in order to determine the lowest possible permit limits that were technologically feasible.[42] That analysis has not changed, as the equipment involved and the steps necessary to start it up and shut it down have not changed.

Based on all of this information, the District has determined that current BACT for startup and shutdown at Oakley Generating Station is the same as was determined in the 2011 FDOC, and that the startup and shutdown conditions in the CEC license and the Authority to Construct meet current BACT standards. The District has determined that these are the most stringent emission limits that can be achieved by this facility based on all of the information available at this time regarding the performance of this newly developed technology.

III.A.7. Combustor Tuning

The District also evaluated BACT for combustor tuning in the 2011 FDOC. As discussed in the FDOC, a separate provision for this routine maintenance activity is appropriate and necessary for keeping the gas turbines in optimal operating condition and to ensure that they will be able to meet their very stringent BACT emissions limits. The District found that up to 8 hours of combustor tuning activity twice per year would be needed, based on an evaluation of the types of activities the facility will need to undertake during tuning. The District further concluded that the appropriate BACT emissions limitations that should apply during tuning activities were the hourly emission limits applicable during cold startups (96 lb/hour of NO_x, 260 lb/hour of CO, and 67 lb/hour of POC), since traditionally tuning has been done during cold startups at facilities without fast-start technology.[43] The facility may be able to lower those limits once it is built and actual operating data becomes available, and so the FDOC also recommended a provision for

[42] *See* FDOC, *supra* note 4, pp. 51-54.

[43] *See* FDOC, *supra* note 4, at p. 56-57.

adjusting these limits downwards based on test results from the facility's first tuning event. The FDOC recommended these limits for tuning activities, and they were included in the CEC's license conditions and in the District's subsequent Authority to Construct.

The District has reviewed this BACT determination in evaluating the request for renewal of the Authority to Construct and found that it continues to meet current BACT standards. The technical analysis of how long it will take to conduct the necessary tuning activities remains the same, and there is no new data or information on which to base emissions limits during tuning activities other than the cold startup limits that the District relied on in the FDOC. Thus, the rationales on which the FDOC's BACT analysis was based remain unchanged.[44] The District therefore concludes that its BACT determination of 8 hours per tuning event, two tuning events per turbine per year, and hourly emissions limits based on cold starts (96 lb/hour of NO_x, 260 lb/hour of CO, and 67 lb/hour of POC) with a provision to reassess the limits based on actual operating data, meets current BACT.

III.A.8. Commissioning

In the 2011 FDOC, the District determined that the Best Available Control Technology for commissioning is the use of best work practices to minimize emissions as much as possible during commissioning, and expediting the commissioning process so that compliance with the stringent BACT limits for normal operations can be achieved as quickly as possible. To determine what numerical BACT permit limits could be imposed, the District reviewed commissioning limits imposed in permits for other facilities; manufacturer's estimates of equipment emissions when operating under commissioning conditions; and a summary of the activities that will need to be completed for commissioning and the amount of time and emissions that will be involved in doing so. Based on this information, the District determined that the appropriate BACT permit conditions were a requirement to tune the gas turbines to minimize emissions at the earliest feasible opportunity; a requirement to install, adjust and operate the SCR systems and oxidation catalysts at the earliest feasible opportunity; a limit on the total amount of time the turbines can be operated without abatement or with partial abatement of 831 hours in total for both turbines; NOx emissions limits of 148.7 lb/hr and 2380.8

[44] There were no other permits that had been issued for similar facilities at the time of the FDOC that imposed limits for tuning activities, and so the District was unable to compare the Oakley limits with any other "achieved in practice" permit limits in the FDOC's BACT analysis for tuning. More recently, one facility, the Lodi Energy Center, has applied to the CEC for permit limits for tuning activities. The bulk of the proposed tuning limits for the Lodi facility are higher than the Oakley limits, and the proposed overall annual tuning limit is higher than the Oakley limit, although the proposed hourly POC limit is somewhat lower than the Oakley limit. *See* Petition to Amend Air Quality Conditions of Certification for the Lodi Energy Center Project (08-AFC-10C) prepared by Sierra Research, Inc. dated February 2, 2013 at p. 3. (available at: http://energy.ca.gov/sitingcases/lodi/compliance/2013-02-01_PTAmend_Air_Quality_Conditions.pdf). However, these are only proposed conditions and have not yet been finalized. Accordingly, the proposed Lodi POC limit does not establish that a lower limit has been achieved in practice. In addition, the high CO limits at Lodi, which the facility is seeking to increase further, indicates that POC emissions are likely higher than anticipated as well.

lb/day; and CO emissions limits of 700 lb/hr and 13,303 lb/day.[45] These limits were included in the CEC's license conditions and in the District's subsequent Authority to Construct.

The District has reviewed this BACT determination in evaluating the request for renewal of the Authority to Construct and found that it continues to meet current BACT standards. The turbine specifications for the facility have not changed, and so the equipment manufacturer's estimates of the extent of the necessary commissioning activities, and the emissions from the equipment during those commissioning activities, have not changed. The District also researched whether any other permits with more stringent limits have been issued since the 2011 FDOC, and found that the only permit for a similar facility that was not evaluated in the FDOC is the LADWP-Scattergood permit referred to above. That permit allows up to 460 hours for commissioning of the single gas turbine and steam turbine that will be installed at that facility under the permit.[46] Since the Oakley Generating Station has two gas turbines and one steam turbine, and its commissioning period is limited to 831 hours, the limit for LADWP Scattergood is not more stringent.

Based on the information above, the District has concluded that the BACT determination for commissioning made in the FDOC, and the BACT permit conditions for commissioning included in the CEC license and Authority to Construct, continue to meet current BACT requirements.

III.B. BACT for Diesel Fire Pump Engine

The Oakley Generating Station diesel fire pump engine is subject to BACT for NO_x and CO because it has a potential to emit those pollutants in amounts over 10 pounds per day. In the 2011 FDOC, the District determined that the Best Available Control Technology for the diesel fire pump engine is the use of an engine meeting EPA "Tier 3" emission standards and ultra-low-sulfur diesel fuel. The District has reviewed this BACT determination and found that these limits meet current BACT.

The District's BACT determination was based on a finding that the facility could use ultra-low sulfur diesel fuel and could use a diesel engine incorporating the latest in clean-combustion technologies. The District found that the cleanest such engines are those meeting EPA's Tier 3 diesel engine emissions standards, which are the most stringent standards applicable to new engines that are available for use at this facility. The District also considered whether an additional post-combustion control device, such as an SCR, lean-NOx catalyst, or NOx trap system, should be required. The District found that such post-construction control devices are not feasible for direct-drive fire pump engines of the type needed for fire suppression purposes at

[45] *See* FDOC, *supra* note 4, pp. 57-61.

[46] *See* Facility Permit to Operate LA city, DWP Scattergood Generating Stn, Facility ID 800075, Revision # 43, dated April 4, 2013 issued by South Coast Air Quality Management District, condition E193.3 at pp. 39-40..

the Oakley Generating Station, however, and would in fact be incompatible with the National Fire Protection Association's standards for such purposes. The District therefore concluded that such add-on control technologies are not BACT for this equipment.

The District reviewed this BACT determination and found that none of the bases for it have changed. Ultra-low sulfur fuel continues to be available as a clean-fuel technique for reducing emissions. EPA's Tier 3 engine standards continue to be the most stringent standards applicable for emergency diesel engines, and engines meeting this standard continue to be the cleanest engines available for this type of application.[47] Post-combustion control devices continue to be inappropriate for use in an emergency fire suppression application such as the Oakley fire pump here. The BACT determination in the FDOC and the BACT requirements applicable to the emergency diesel fire pump engine in the CEC license and the Authority to Construct continue to meet current BACT requirements.

[47] Tier 4 standards have come into effect for prime engines, but EPA and the California Air Resources Board have not applied these more stringent standards to emergency diesel engines, for a variety of reasons. *See* Staff Report: Initial Statement of Reasons for Proposed Rulemaking; Proposed Amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines, California Air Resources Board dated September 2010 at pp. 4-14 (available at: www.arb.ca.gov/regact/2010/atcm2010/atcmisor.pdf).

IV. Offsets

The second requirement for a renewal of an Authority to Construct under District Regulation 2-1-407.1.2 is that the facility must meet current emission offset requirements under District Regulations 2-2-302 and 2-2-303. Neither the District's effective offset requirements nor Oakley Generating Station's annual emissions have changed since the initial Authority to Construct. The offsets provided for the Authority to Construct issuance are therefore still valid and meet current emission offset requirements.

V. Procedural Requirements and Related Issues

The District has reviewed applicable procedural requirements for renewing the Authority to Construct to ensure that the District's renewal action will comply with them. These procedural issues, and other related regulatory issues, are addressed below.

V.A. Warren-Alquist Act Consistency with CEC License

Under the Warren-Alquist State Energy Resources Conservation and Development Act (Warren-Alquist Act),[48] any issuance or renewal of an Authority to Construct for a CEC-regulated power plant must be consistent with the license issued for the facility by the CEC. Since the District has determined that the BACT and offset conditions in the CEC license meet current BACT and offset requirements, the District will be renewing the Authority to Construct with the same conditions as included in the CEC license. There will be no inconsistency.

V.B. California Environmental Quality Act

To the extent that this renewal is a discretionary approval subject to the requirements of the California Environmental Quality Act (CEQA), the CEC conducted a thorough environmental analysis of the potential impacts of this project, which is equivalent to an Environmental Impact Report (EIR) for CEQA purposes and satisfies all CEQA requirements for this project. The District's renewal of the Authority to Construct complies with any applicable CEQA requirements based on this CEC environmental analysis. The District has reviewed the CEC's analysis and found that there have been no changes to the project since the CEC's approval, changes in the circumstances under which the project is being undertaken, or new information that was not available at the time of that approval, that would give rise to a need for any subsequent or supplemental environmental analysis.[49]

V.C. Federal "Prevention of Significant Deterioration" Applicability

In addition to the District's state-law permitting program under District Regulation 2, Rule 2, which requires an Authority to Construct for this project, EPA also administers a federal permitting program called the "Prevention of Significant Deterioration" (PSD) program under Section 165 of the Clean Air Act and 40 CFR Section 52.21. The District implements this federal PSD program on EPA's behalf for sources within the San Francisco Bay Area pursuant to a Delegation Agreement between EPA and the District. These federal requirements are separate and apart from the District's Authority to Construct issued under District Regulation 2, Rule 2, and the applicability of any PSD requirements is not related to whether the project satisfies the

[48] *See* Public Resources Code section 25500.

[49] Bay Area Air Quality Management District, Analysis of Compliance with Requirements of California Environmental Quality Act in connection with Renewal of Authority to Construct, Oakley Generating Station, Plant No. 19971, Authority to Construct No. 20798 (August 2013).

requirements for renewal of the Authority of Construct under District Regulation 2-1-407. Nevertheless, the following discussion addresses the issue of federal PSD applicability in the interests of providing full information on the project, because the issue was addressed in the FDOC when this project was originally permitted, and because as a general matter construction should not continue if it will violate federal law, notwithstanding compliance District Regulation 2-1-407.

In 2011 when the project was initially permitted, the project applicant did not apply for a federal PSD permit, and the District did not issue one, based on an understanding that the project is not subject to the requirements of federal PSD program under 40 CFR Section 52.21 and EPA guidance.[50] In particular, with respect to greenhouse gases, the project was not subject to PSD requirements because EPA did not impose PSD permitting requirements for projects based on their greenhouse gas emissions where the project commenced construction before July 1, 2011, and the project applicant began construction activities before this date. The District understands that this continues to be the case, as there does not appear to be anything in CAA Section 165, 40 CFR Section 52.21, or EPA guidance that requires a project to obtain a permit based on its greenhouse gases where it commenced construction before the July 1, 2011 deadline. In the event that this understanding is not correct, and Section 52.21 and/or applicable EPA guidance do now require a PSD permit for this project, the District has asked EPA for guidance under Section VII.1 of the Delegation Agreement on this point. To the extent that the project now requires a PSD permit under federal law, the District will follow EPA guidance and will prohibit construction unless and until the project applies for and receives a PSD permit under 40 CFR Section 52.21. The District has no indication that this is the case, however, as noted above, and therefore does not intend to impose any PSD requirements absent EPA guidance to the contrary.

V.D. District Regulation 2 Permitting Procedures

District Regulation 2-1-407 provides that the District shall renew an Authority to Construct in writing if it determines that the renewal complies with applicable BACT and offset requirements and the holder of the Authority to Construct is not violating any provision or condition of the Authority. The District has evaluated the project's compliance with current BACT and offset requirements in Sections III and IV, and the District is not aware of any non-compliance with any provisions or conditions of the Authority to Construct, and so the applicant satisfies the requirements for renewal under Regulation 2-1-407.

Regulation 2-1-407 also requires that the applicant submit a request for renewal in writing, along with the required fees, prior to the expiration of the Authority to Construct. The applicant submitted a written request for renewal of the Oakley Generating Station Authority to Construct

[50] *See* FDOC, *supra* note 4, Section 7.1. & fn. 62.

on April 4, 2013,[51] and the required fees were processed on May 17, 2013,[52] both of which were before the expiration of the Authority to Construct on June 2, 2013. Per Regulation 2-1-407, the Authority to Construct remains in effect until the District has acted to approve or deny the renewal request.

Renewal of an Authority to Construct is not subject to the public notice and comment provisions applicable to initial permit issuance under District Regulations 2-2-405 through 2-2-407.

[51] *See* Letter dated April 4, 2013, from J. McLucas to K. Truesdell regarding Oakley Generating Station – Plant No. 19771, Application No. 20798; Compliance with Regulation 2-1-407.

[52] *See* email from Payment Notification to K. Truesdell, et. al, regarding Payment Notification for Permit Application '20798' dated May 17. 2013.

VI. Conclusion

The District has reviewed the Authority to Construct for the Oakley Generating Station (Authority to Construct 20798) and has concluded that the Authority to Construct satisfies the requirements for a two-year extension pursuant to District Regulation 2-1-407.1.2, including meeting current District BACT and offset requirements under District Regulations 2-2-301, 2-2-302, and 2-2-303. Because the facility's California Energy Commission License[53] contains the same conditions attached in Appendix A, the District is granting the applicant's Request for Renewal of this Authority to Construct.

[53] *See* Oakley Generating Station Commission Decision CEC-800-2011-002-CMF Docket number 09-AFC-4 dated May 2011 at Public Health: Air Quality pp. 33-55 (available at: http://energy.ca.gov/2011publications/CEC-800-2011-002/CEC-800-2011-002-CMF.pdf)

Appendix A: Permit Conditions in Authority to Construct

The Permit Conditions in the Authority to Construct are set forth in the following Appendix. As required by the Warren-Alquist Act and District Regulation 2, Rule 3, the District included these permit conditions in the Authority to Construct based on the conditions that the CEC imposed in its License for the facility. Consistent with the analysis provided above, the District has determined pursuant to District Regulation 2-1-407.1 that the permit conditions satisfy current BACT and offset requirements under District Regulations 2-2-301, -302, and -303 for the Oakley Generating Station. The District is therefore renewing the Authority to Construct for an additional 2-year term.

Definitions:

Hour:	Any continuous 60-minute period
Clock Hour:	Any continuous 60-minute period beginning on the hour
Calendar Day:	Any continuous 24-hour period beginning at 12:00 midnight or 0000 hours
Year:	Any consecutive twelve-month period of time
Rolling 3-hour period:	Any consecutive three-clock hour period, not including start-up or shutdown periods
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in hours
MMBtu:	million British thermal units
Gas Turbine Cold Start-up	A gas turbine startup that occurs more than 48 hours after a gas turbine shutdown, and is limited in time to the lesser of (i) the first 90 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or (ii) the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves the first of two consecutive CEM data points in compliance with the emission concentration limits of Parts 15(b) and 15(d)
Gas Turbine Hot/Warm Start-up	A gas turbine startup that occurs within 48 hours of a gas turbine shutdown, and is limited in time to the lesser of (i) the first 30 minutes of continuous fuel flow to the Gas Turbine after

	fuel flow is initiated or (ii) the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves the first of two consecutive CEM data points in compliance with the emission concentration limits of Parts 15(b) and 15(d)
Gas Turbine Shutdown:	The lesser of the 30-minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Parts 15(b) and 15(d) until termination of fuel flow to the Gas Turbine
Gas Turbine Combustor Tuning:	The period of time, not to exceed 8 operating hours per tuning event, in which testing, adjustment, tuning, and calibration operations are performed, as recommended by the gas turbine manufacturer, to ensure safe and reliable steady-state operation, and to minimize NO_X and CO emissions.
Specified PAHs:	The polycyclic aromatic hydrocarbons listed below shall be considered to be Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds: Benzo[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Dibenzo[a,h]anthracene Indeno[1,2,3-cd]pyrene
Corrected Concentration:	The concentration of any pollutant (generally NO_X, CO, or NH_3) corrected to a standard stack gas oxygen concentration. For emission points P-1, the exhaust of Gas Turbine (S-1), and P-2, the exhaust of Gas Turbine (S-2), the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis. For emission point P-3, the exhaust of Auxiliary Boiler (S-3), the standard stack gas oxygen concentration is 3% O_2 by volume on a dry basis.
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the OGS construction contractor to ensure safe and reliable steady-state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems during the commissioning period

Commissioning Period:	The Commissioning Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The Commissioning Period for each gas turbine shall terminate when the activities identified in the Commissioning Plan (submitted under Part 4 below) are complete and the gas turbine has reached safe and reliable steady-state operation as demonstrated by compliance with NO_x and CO normal operating limits using the continuous emissions monitors.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CEC CPM:	California Energy Commission Compliance Program Manager
OGS:	Oakley Generating Station
Owner/operator:	The owner/operator of Oakley Generating Station
Total Particulate Matter:	The sum of all filterable and all condensable particulate matter.

GE 7FA Combined-Cycle Gas Turbines

Applicability:

Parts 1 through 9 of this condition shall only apply during the commissioning period as defined above. Unless otherwise indicated, Parts 10 through 30 of this condition shall apply after the commissioning period has ended.

Conditions for the Commissioning Period for GE 7FA Gas Turbines (S-1 and S-2)

1. The owner/operator shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 and S-2 Gas Turbines to the maximum extent possible during the commissioning period. (Basis: BACT, Regulation 2, Rule 2, Section 409)
2. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune the S-1 and S-2 Gas Turbines combustors to minimize the emissions of carbon monoxide and nitrogen oxides. (Basis: BACT, Regulation 2, Rule 2, Section 409)
3. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall install, adjust, and operate the A-2 and A-4 Oxidation Catalysts and A-1 and A-3 SCR Systems to minimize the emissions of carbon monoxide and nitrogen oxides from S-1 and S-2 Gas Turbines. (Basis: BACT, Regulation 2, Rule 2, Section 409)

4. The owner/operator shall submit a plan to the District Engineering Division and the CEC CPM at least four weeks prior to first firing of S-1 and S-2 Gas Turbines describing the procedures to be followed during the commissioning of the gas turbines. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO_X combustors, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NO_X continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1 and S-2) without abatement or with partial abatement by their respective oxidation catalysts and/or SCR Systems. The owner/operator shall not fire any of the Gas Turbines (S-1 or S-2) sooner than 28 days after the District receives the commissioning plan. (Basis: Regulation 2, Rule 2, Section 419)

5. During the commissioning period, the owner/operator shall demonstrate compliance with Parts 7, 8, and 9 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters and emission concentrations:

   -firing hours

   -fuel flow rates

   -stack gas nitrogen oxide emission concentrations

   -stack gas carbon monoxide emission concentrations

   -stack gas oxygen concentrations

   The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines (S-1 and S-2). The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO_X and CO emission concentrations, summarized for each clock hour and each calendar day. The owner/operator shall retain records on site for at least 5 years from the date of entry and make such records available to District personnel upon request. (Basis: Regulation 2, Rule 2, Section 419)

6. The owner/operator shall install, calibrate, and operate the District-approved continuous monitors specified in Part 5 prior to first firing of the Gas Turbines (S-1 and S-2). After first firing of the turbines, the owner/operator shall adjust the detection range of these continuous emission monitors as necessary to accurately measure the resulting range of CO and NO_X emission concentrations. The instruments shall operate at all times of operation of S-1 and S-2 including start-up, shutdown, upset, and malfunction, except as allowed by BAAQMD Regulation 1-522, BAAQMD Manual of Procedures, Volume V. If necessary to comply with this requirement, the owner/operator shall install dual-span monitors. The type, specifications, and location of these monitors shall be subject to District review and approval. (Basis: Regulation 2, Rule 2, Section 419)

7. The owner/operator shall not fire S-1 and S-2 Gas Turbine without abatement of nitrogen oxide emissions by the corresponding SCR System A-1 and A-3 and/or abatement of carbon monoxide emissions by the corresponding Oxidation Catalyst A-2 and A-4 for more than a combined total of 831 hours during the commissioning period. Such operation of any Gas

Turbine (S-1, S-2) without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and/or oxidation catalyst in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Engineering Division and Compliance and Enforcement Division and the unused balance of the 831 firing hours without abatement shall expire. (Basis: BACT, Regulation 2, Rule 2, Section 409)

8. The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM_{10}, and sulfur dioxide that are emitted by the Gas Turbines (S-1, and S-2) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in Part 43. (Basis: Regulation 2, Rule 2, Section 409)

9. The owner/ operator shall not operate the Gas Turbines (S-1 and S-2) in a manner such that the pollutant emissions from each gas turbine will exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1, S-2). (Basis: BACT, Regulation 2, Rule 2, Section 409)

NO_X (as NO_2)	2,380.8 pounds per calendar day	148.7 pounds per hour
CO	13,303 pounds per calendar day	700 pounds per hour

Conditions for the GE 7FA Combined-Cycle Gas Turbines (S-1 and S-2)

10. The owner/operator shall fire the Gas Turbines (S-1 and S-2) exclusively on PUC regulated natural gas with a maximum sulfur content of 1 grain per 100 standard cubic feet. To demonstrate compliance with this limit, the operator of S-1 and S-2 shall sample and analyze the gas from each supply source at least monthly to determine the sulfur content of the gas. PG&E monthly sulfur data may be used provided that such data can be demonstrated to be representative of the gas delivered to the OGS. (Basis: BACT for SO_2 and PM_{10})

11. The owner/operator shall not operate the units such that the heat input rate to each Gas Turbine (S-1 and S-2) exceeds 2,150 MMBtu (HHV) per hour. (Basis: BACT for NO_X)

12. The owner/operator shall not operate the units such that the heat input rate to each Gas Turbine (S-1 and S-2) exceeds 51,600 MMBtu (HHV) per day. (Basis: Cumulative Increase for PM_{10})

13. The owner/operator shall not operate the units such that the combined cumulative heat input rate for the Gas Turbines (S-1 and S-2) exceeds 35,397,277 MMBtu (HHV) per year. (Basis: Offsets)

14. The owner/operator shall ensure that each Gas Turbine (S-1, S-2) is abated by the properly operated and properly maintained Selective Catalytic Reduction (SCR) System A-1 or A-3 and Oxidation Catalyst System A-2 or A-4 whenever fuel is combusted at those sources and the corresponding SCR catalyst bed (A-1 or A-3) has reached minimum operating temperature. (Basis: BACT for NO_X, POC and CO)

15. The owner/operator shall ensure that the Gas Turbines (S-1, S-2) comply with the following limits. The limits in this part do not apply during a gas turbine start-up, combustor tuning operation or shutdown. (Basis: BACT and Regulation 2, Rule 5)

    a) Nitrogen oxide mass emissions (calculated as NO_2) at each exhaust point P-1 and P-2 (exhaust point for S-1 and S-2 Gas Turbine after abatement by A-1 and A-3 SCR System) shall not exceed 15.52 pounds per hour, averaged over any 1-hour period. (Basis: Cumulative Increase for NO_X)

    b) The nitrogen oxide emission concentration at each exhaust point P-1 and P-2 shall not exceed 2.0 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 1-hour period. (Basis: BACT for NO_X)

    c) Carbon monoxide mass emissions at each exhaust point P-1 and P-2 shall not exceed 9.45 pounds per hour, averaged over any 1-hour period. (Basis: Cumulative Increase for CO)

    d) The carbon monoxide emission concentration at each exhaust point P-1 and P-2 shall not exceed 2.0 ppmv, on a dry basis, corrected to 15% O_2 averaged over any 1-hour period. (Basis: BACT for CO)

    e) Ammonia (NH_3) emission concentrations at each exhaust point P-1 and P-2 shall not exceed 5 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate to each SCR System A-1 and A-3. The correlation between the gas turbine heat input rates, A-1 and A-3 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2 shall be determined in accordance with Part 24 or a District approved alternative method. The APCO may require the installation on one exhaust point (P-1 or P-2 at the owner/operator's discretion) of a CEM designed to monitor ammonia concentrations if the APCO determines that a commercially available CEM has been proven to be accurate and reliable and that an adequate Quality Assurance/Quality Control protocol for the CEM has been established. The District or another agency must establish a District-approved Quality Assurance/Quality Control protocol prior to the ammonia CEM being a requirement of this part. The APCO shall use the first year of ammonia CEM data to establish the appropriate ammonia emission concentration limit and averaging time for compliance demonstration by CEM. After the APCO has established the ammonia limit, the ammonia CEM shall be used to demonstrate compliance for the gas turbine being monitored by CEM. The gas turbine with the ammonia CEM shall still be subject to the emission testing requirements in Part 24. For the gas turbine with the ammonia CEM, calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate shall be submitted to the District for informational purposes only. (Basis: Regulation 2, Rule 5)

f) Precursor organic compound (POC) mass emissions (as CH_4) at each exhaust point P-1 and P-2 shall not exceed 2.71 pounds per hour. (Basis: Cumulative Increase for POC)

16. The owner/operator shall ensure that the regulated air pollutant mass emission rates from each of the Gas Turbines (S-1, and S-2) during a start-up or shutdown does not exceed the limits established below. (Basis: BACT Limit for Non-Steady-State Operation)

Pollutant	**Hot/Warm Startup (lb/startup)**	**Maximum Emissions During an Hour Containing a Hot/Warm Startup (lb/hr)**	**Maximum Emissions Per Cold Startup (lb/startup)**	**Maximum Emissions During an Hour Containing a Cold Startup (lb/hr)**	**Maximum Emissions Per Shutdown (lb/shutdown)**	**Maximum Emissions During an Hour Containing a Shutdown (lb/hr)**
NO_X (as NO_2)	22.3	33.9	96.3	99.9	39.3	46.8
CO	85.2	92.2	360.2	362.4	140.2	144.7
POC (as CH_4)	31.1	33.1	67.1	67.7	17.1	18.4

17. The owner/operator shall not perform combustor tuning on each Gas Turbine (S-1 or S-2) more than twice in any consecutive 12 month period. Each tuning event shall not exceed 8 hours. Combustor tuning shall only be performed on one gas turbine per day. The owner/operator shall notify the District Engineering Division and Compliance and Enforcement Division no later than 7 days prior to combustor tuning activity, except in exigent circumstances. If exigent circumstances arise, the owner/operator shall notify the District Engineering Division and Compliance and Enforcement Division in writing 24 hours prior to combustor tuning activity detailing the circumstances. The emissions during combustor tuning from each gas turbine shall not exceed the hourly limits established below, and shall not exceed hourly limits established by the District based on emissions data obtained during the first tuning event for each turbine. The owner/operator shall measure and record mass emissions of NO_x and CO using the continuous emission monitors during tuning.

    The owner/operator shall measure POC emissions during the first tuning after the first turbine has been commissioned using a District-approved source test method. The owner/operator shall seek District approval of the test method in accordance with Part 29 below. The owner/operator shall submit the record of the NO_x, CO, and POC emissions during the first tuning event after the first turbine has been commissioned to the District

within 60 days after the first tuning event. The District shall establish mass emissions limits for the future tuning events based on this test data and shall notify the owner/operator of these limits. (Basis: BACT, Offsets, Cumulative Increase)

Pollutant	Emissions Limit (lb/hr)
NO_X (as NO_2)	96
CO	360
POC (as CH_4)	67

18. The owner/operator shall not allow total emissions from each Gas Turbine (S-1 or S-2), including emissions generated during gas turbine start-ups, and shutdowns to exceed the following limits during any calendar day (except for days during which combustor tuning events occur, which are subject to Part 19 below):

    a) 488 pounds of NO_X (as NO_2) per day (Basis: Cumulative Increase)

    b) 715 pounds of CO per day (Basis: Cumulative Increase)

    c) 146 pounds of POC (as CH_4) per day (Basis: Cumulative Increase)

19. The owner/operator shall not allow total emissions from each Gas Turbine (S-1 or S-2), including emissions generated during gas turbine start-ups, shutdowns, and combustor tuning events to exceed the following limits during any calendar day on which a tuning event occurs:

    a) 971 pounds of NO_X (as NO_2) per day (Basis: Cumulative Increase)

    b) 2818 pounds of CO per day (Basis: Cumulative Increase)

    c) 531 pounds of POC (as CH_4) per day (Basis: Cumulative Increase)

20. The owner/operator shall not allow the maximum projected annual toxic air contaminant emissions (per Part 23) from the Gas Turbines (S-1, S-2) combined to exceed the following limits:

Formaldehyde	16,636.1 pounds per year
Benzene	462.9 pounds per year
Specified polycyclic aromatic hydrocarbons (PAHs)	4.54 pounds per year

    unless the following requirement is satisfied:

    The owner/operator shall perform a health risk assessment to determine the total facility risk using the emission rates determined by source testing and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. The owner/operator shall submit the risk analysis to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will not result in a significant cancer risk, the District and the CEC CPM may, at their

discretion, adjust the carcinogenic compound emission limits listed above. (Basis: Regulation 2, Rule 5)

21. The owner/operator shall demonstrate compliance with Parts 11 through 13, 15(a) through 15(d), 16 (NO_X, and CO limits), 17 (NO_X and CO limits), 18(a), 18(b), 19(a), 19(b), 43(a) and 43(b) by using properly operated and maintained continuous monitors (during all hours of operation including gas turbine start-up, combustor tuning, and shutdown periods). If necessary to comply with this requirement, the owner/operator shall install dual-span monitors. The owner/operator shall monitor for all of the following parameters and record each parameter at least every 15 minutes (excluding normal calibration periods):

    a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 and S-2

    b) Oxygen (O_2) concentration, Nitrogen Oxides (NO_X) concentration, and carbon monoxide (CO) concentration at exhaust points P-1 and P-2

    c) Ammonia injection rate at A-1 and A-2 SCR Systems

    The owner/operator shall use the parameters measured above and District approved calculation methods to calculate and record the following parameters for each gas turbine (S-1 and S-2):

    d) Corrected NO_X concentration and corrected CO concentration, averaged for each clock hour

    e) Corrected NO_X concentration and corrected CO concentration, averaged for each calendar day

    The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate and record the following parameters for each gas turbine (S-1 and S-2) and totaled for S-1 and S-2:

    f) For each rolling three hour period, the heat input rate in MMBtu (HHV) per hour

    g) For each calendar day, the average hourly heat input rate in MMBtu (HHV) per hour and total daily heat input rate in MMBtu (HHV) per day

    h) For each consecutive twelve month period, the total heat input rate in MMBtu (HHV) per year

    i) For each clock hour, the NO_X mass emission rate (as NO_2) and CO mass emissions rate in pounds per hour

    j) For each calendar day, the NO_X mass emission rate (as NO_2) and CO mass emissions rate in pounds per day

    k) For each consecutive 12-month period, the monthly NO_X (as NO_2) and CO mass emissions rates in pounds per month and annual NO_X and CO mass emissions rates in pounds per year and tons per year

    (Basis: 1-520.1, 9-9-501, BACT, Offsets, NSPS, Cumulative Increase)

22. To demonstrate compliance with Parts 15(f), 18(c), 19(c), and 43(c) the owner/operator shall calculate and record on a daily basis, the precursor organic compound (POC) mass emissions from each power train. The owner/operator shall use the actual heat input rates measured

pursuant to Part 21, actual Gas Turbine start-up times, actual Gas Turbine shutdown times, and CEC and District-approved emission factors developed pursuant to source testing under Part 25 to calculate these emissions. The owner/operator shall present the calculated emissions in the following format:

a) For each calendar day, POC mass emissions, summarized for each gas turbine and S-1 and S-2 combined

b) For each consecutive 12-month period, the cumulative total POC mass emissions for each gas turbine and S-1 and S-2 combined.

(Basis: Offsets, Cumulative Increase)

23. To demonstrate compliance with Part 20, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions of: Formaldehyde, Benzene, and Specified PAHs. The owner/operator shall calculate the maximum projected annual emissions using the combined maximum annual heat input rate of 35,397,277 MMBtu/year for S-1 and S-2 combined and the highest emission factor (pounds of pollutant per MMBtu of heat input) determined by the most recent of any source test of the S-1 or S-2 Gas Turbines. If the highest emission factor for a given pollutant occurs during minimum-load turbine operation, a reduced annual heat input rate may be utilized to calculate the maximum projected annual emissions to reflect the reduced heat input rates during gas turbine start-up and minimum-load operation. The reduced annual heat input rate shall be subject to District review and approval. (Basis: Regulation 2, Rule 5)

24. Within 90 days of the beginning of the start-up period (as defined in Regulation 2-1-210) of each of the OGS GE 7FA units or as otherwise approved by the APCO, the owner/operator shall conduct a District-approved source test on each corresponding exhaust point P-1 or P-2 to determine the corrected ammonia (NH_3) emission concentration to determine compliance with Part 15(e). The source test shall determine the correlation between the heat input rates of the gas turbine, A-1 or A-3 SCR System ammonia injection rate, and the corresponding NH_3 emission concentration at emission point P-1 or P-2. The source test shall be conducted over the expected operating range of the turbine (including, but not limited to, minimum and full load modes) to establish the range of ammonia injection rates necessary to achieve NO_X emission reductions while maintaining ammonia slip levels. The owner/operator shall repeat the source testing on an annual basis thereafter. Ongoing compliance with Part 15(e) shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of conducting the tests. (Basis: Regulation 2, Rule 5)

25. Within 90 days of the beginning of the start-up period (as defined in Regulation 2-1-210) of each of the OGS GE 7FA units or as otherwise approved by the APCO and, at a minimum, on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each Gas Turbine is operating at maximum load to determine compliance with Parts 15(a), 15(b), 15(c), 15(d), 15(f), and to establish the emissions factors to be used to demonstrate compliance with Parts 43(d) and 43(e); and while each Gas Turbine is operating at minimum load to determine compliance with Parts 15(c) and 15(d); and to verify the accuracy of the continuous emission monitors required in Part 21. The owner/operator shall test for (as a minimum each year): water content, stack gas flow

rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide concentration and mass emissions (as NO_2), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and PM_{10} emissions including condensable particulate matter. The owner/operator may conduct source tests of individual compounds listed in this part separately. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of conducting the tests. The owner/operator may perform up to four tests per year for PM_{10} emissions including condensable particulate matter. (Basis: BACT, Offsets, Cumulative Increase)

26. Within 90 days of the beginning of the start-up period (as defined in Regulation 2-1-210) of each OGS GE 7FA units or as otherwise approved by the APCO, the owner/operator shall conduct District- and CEC-approved source tests for that Gas Turbine to determine compliance with the emission limitations specified in Part 16. The source tests shall determine NO_X, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Thirty working days before the execution of the source tests, the owner/operator shall submit to the District and the CEC Compliance Program Manager (CPM) a detailed source test plan designed to satisfy the requirements of this Part. The District and the CEC CPM will notify the owner/operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The owner/operator shall incorporate the District and CEC CPM comments into the test plan. The owner/operator shall notify the District and the CEC CPM within seven (7) working days prior to the planned source testing date. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of the source testing date. (Basis: Regulation 2, Rule 2, Section 419)

27. Within 90 days of the beginning of the start-up period (as defined in Regulation 2-1-210) of the second of the OGS GE 7FA gas turbines or as otherwise approved by the APCO, and on a biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on one of the following exhaust points P-1 or P-2 while the Gas Turbine is operating at maximum allowable operating rates to demonstrate compliance with Part 20. The owner/operator shall also test the gas turbine while it is operating at minimum load. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to Part 23 for any of the compounds are less than 50% of the levels listed in Part 20, then the owner/operator may discontinue future testing for that pollutant. (Basis: Regulation 2, Rule 5)

28. Within 90 days of the beginning of the start-up period (as defined in Regulation 2-1-210) of each of the OGS GE 7FA gas turbines or as otherwise approved by the APCO and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on one of the two exhaust points P-1 or P-2 while the gas turbine is operating at maximum heat input rate to demonstrate compliance with the total sulfuric acid mist emission rate for S-1 and S-2 of 6.3 tons per year. The owner/operator shall test for (as a minimum) SO_2, SO_3, and H_2SO_4, and the sulfur content of the fuel. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of conducting the tests. (Basis: Regulation 2, Rule 5)

29. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CEC CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CEC CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the owner/operator shall measure the contribution of condensable PM (back half) to any measurement of the total particulate matter or PM_{10} emissions. However, the owner/operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of conducting the tests. (Basis: BACT, Regulation 2, Rule 2, Section 419)

30. The owner/operator shall ensure that the stack height of emission points P-1 and P-2 is each at least 155.5 feet above grade level at the stack base. (Basis: Regulation 2, Rule 5)

Auxiliary Boiler (S-3)

31. The owner/operator shall submit manufacturer's specifications and emissions guarantees for NO_x and CO for the Auxiliary Boiler (S-3) to the District Engineering Division and the CEC CPM at least four weeks prior to first firing of Auxiliary Boiler (S-3). (Basis: Regulation 2, Rule 2, Section 419)

32. If Oxidation Catalyst (A-5) is required, the owner/operator shall install, adjust, and operate the A-5 Oxidation Catalyst at the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, to minimize the emissions of carbon monoxide from S-3 Auxiliary Boiler. (Basis: Regulation 2, Rule 2, Section 419)

33. The heat input rate to the Auxiliary Boiler (S-3) shall not exceed 50.6 MMBtu per hour, averaged over any rolling 3-hour period. (Basis: Cumulative Increase)

34. The heat input rate to the Auxiliary Boiler (S-3) shall not exceed 218,606 MMBtu per year. (Basis: Cumulative Increase)

35. The owner/operator of the Auxiliary Boiler (S-3) shall meet all of the requirements listed in below.

    a) Nitrogen oxide emissions at P-3 (the exhaust point for the Auxiliary Boiler) shall not exceed 9.8 pounds per day, calculated as NO_2. (Basis: Regulation 2-1-403)

    b) Carbon monoxide emissions at P-3 shall not exceed 9.8 pounds per day. (Basis: Regulation 2-1-403)

    c) POC emissions (as CH_4) at P-3 shall not exceed 2.8 pounds per day. (Basis: Regulation 2-1-403)

36. The owner/operator shall demonstrate compliance with Parts 35(a), 35(b) and 43(a) and 43(b) by using properly operated and maintained continuous monitors (during all hours of operation including auxiliary boiler start-up, tuning, and shutdown periods). The owner/operator shall monitor for all of the following parameters and record each parameter at least every 15 minutes (excluding normal calibration periods):

    a) Firing Hours and Fuel Flow Rates

    b) Oxygen (O_2) concentration, Nitrogen Oxides (NO_X) concentration, and carbon monoxide (CO) concentration at exhaust point P-3

    The owner/operator shall use the parameters measured above and District approved calculation methods to calculate and record the following parameters for the Auxiliary Boiler (S-3):

    c) Corrected NO_X concentration and corrected CO concentration, averaged for each clock hour

    d) Corrected NO_X concentration and corrected CO concentration, averaged for each calendar day

    The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate and record the following parameters for Auxiliary Boiler (S-3):

    e) For each rolling three hour period, the heat input rate in MMBtu (HHV) per hour

    f) For each calendar day, the average hourly heat input rate in MMBtu (HHV) per hour and total daily heat input rate in MMBtu (HHV) per day

    g) For each consecutive twelve month period, the total heat input rate in MMBtu (HHV) per year

    h) For each clock hour, the NO_X mass emission rate (as NO_2) and CO mass emissions rate in pounds per hour

    i) For each calendar day, the NO_X mass emission rate (as NO_2) and CO mass emissions rate in pounds per day

    j) For each consecutive 12-month period, the monthly NO_X (as NO_2) and CO mass emissions rates in pounds per month and annual NO_X (as NO_2) and CO mass emissions rates in pounds per year and tons per year

    (Basis: 1-520.1, 9-7-307, BACT, Offsets, Cumulative Increase)

37. To demonstrate compliance with Part 35(c) the owner/operator shall calculate and record on a daily basis, the precursor organic compound (POC) mass emissions from the auxiliary boiler. The owner/operator shall use the actual heat input rates measured pursuant to Part 36, and CEC and District-approved emission factors developed pursuant to source testing under Part 38 to calculate these emissions. The owner/operator shall present the calculated emissions in the following format:

    a) For each calendar day, POC mass emissions, summarized for S-3

b) For each consecutive 12-month period, the cumulative total POC mass emissions for S-3.

(Basis: Offsets, Cumulative Increase)

38. Within 90 days of start-up of Auxiliary Boiler (S-3), the owner/operator shall conduct a District-approved source test on exhaust point P-3 while the auxiliary boiler is operating at maximum load to determine emission factors for POC, PM_{10} and SO_x. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide concentration and mass emissions (as NO_2), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and PM_{10} emissions including condensable particulate matter. Thirty working days before the execution of the source tests, the owner/operator shall submit to the District and the CEC Compliance Program Manager (CPM) a detailed source test plan designed to satisfy the requirements of this Part. The District and the CEC CPM will notify the owner/operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The owner/operator shall incorporate the District and CEC CPM comments into the test plan. The owner/operator shall notify the District and the CEC CPM within seven (7) working days prior to the planned source testing date. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of the source testing date. (Basis: Regulation 2, Rule 2, Section 419)

Conditions for the Fire Pump Diesel Engine (S-4)

39. The owner/operator shall fire the Fire Pump Diesel Engine (S-4) exclusively on diesel fuel having a sulfur content no greater than 0.0015% by weight. (Regulation 2, Rule 5, Cumulative Increase, "Stationary Diesel Engine ATCM", CA Code of Regulations, Title 17, Section 93115.5(a))

40. The owner/operator shall operate the Fire Pump Diesel Engine (S-4) for no more than 49 hours per year for the purpose of reliability testing and non-emergency operation. (Regulation 2, Rule 5, Cumulative Increase, "Stationary Diesel Engine ATCM", CA Code of Regulations, Title 17, Section 93115.6(a)(4)(A))

41. The owner/operator shall operate the Fire Pump Diesel Engine (S-4) only when a non-resettable totalizing hour meter (with a minimum display capability of 9,999 hours) is installed, operated and properly maintained. (Basis: BAAQMD Regulation 9-8-530, "Stationary Diesel Engine ATCM", CA Code of Regulations, Title 17, Section 93115.10(e)(1))

42. The owner/operator shall maintain the following monthly records for Fire Pump Engine (S-4) in a District-approved log for at least 5 years.

    a. Hours of operation for reliability-related activities (maintenance and testing).

    b. Hours of operation for emission testing to show compliance with emission limits.

    c. Hours of operation for emergency use.

    d. For each emergency, the nature of the emergency condition.

e. Fuel usage.

Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request. (Basis: BAAQMD Regulation 9-8-530, "Stationary Diesel Engine ATCM", CA Code of Regulations, Title 17, Section 93115.10(g))

Conditions for the Combined-Cycle Gas Turbines (S-1 and S-2), Auxiliary Boiler (S-3), and Fire Pump Engine (S-4)

43. The owner/operator shall not allow total combined emissions from the Gas Turbines (S-1 and S-2), including emissions generated during gas turbine start-ups, combustor tuning, shutdowns, and malfunctions, the auxiliary boiler (S-3), including emissions generated during auxiliary boiler start-ups, tune-ups, shutdowns, and malfunctions, and the fire pump diesel engine (S-4), including non-emergency and emergency operation, to exceed the following limits during any consecutive twelve-month period:

a) 98.78 tons of NO_x (as NO_2) (Basis: Offsets)

b) 98.82 tons of CO (Basis: Cumulative Increase)

c) 29.49 tons of POC (as CH_4) (Basis: Offsets)

d) 63.78 tons of PM_{10} (Basis: Cumulative Increase)

e) 12.55 tons of SO_2 (Basis: Cumulative Increase)

Compliance with the limits in this part shall be determined using the following procedures:

Emissions of PM_{10} and SO_2 from each gas turbine shall be calculated by multiplying turbine fuel usage times an emission factor determined by source testing of the turbine conducted in accordance with Part 25. The emission factor for each turbine shall be based on the average of the emissions rates observed during the 4 most recent source tests on that turbine (or, prior to the completion of 4 source tests on a turbine, on the average of the emission rates observed during all source tests on the turbine).

Emissions of PM_{10}, SO_2, and POC from the auxiliary boiler shall be calculated by multiplying auxiliary boiler fuel usage times an emission factor determined by source testing of the auxiliary boiler conducted in accordance with Part 38.

The owner/operator shall calculate emissions from the fire pump diesel engine from the hours of operation recorded in Part 42 and the following emission factors:

NO_x: 2.62 g/hp-hr

CO: 0.67 g/hp-hr

POC: 0.14 g/hp-hr

PM: 0.119 g/hp-hr

SO_x: 0.004 g/hp-hr

44. To demonstrate compliance with Part 43, the owner/operator shall record the total emissions for each consecutive 12-month period. The owner/operator shall calculate emissions of each pollutant listed in Part 43(a) through (e) from the gas turbines, auxiliary boiler, and fire pump diesel engine for each calendar month using the calculation procedures established in Part 43,

and shall calculate annual emissions to determine compliance with the limits listed in Part 43(a) through (e) by summing the monthly totals for the previous 12 months. (Basis: Regulation 2, Rule 2, Section 419)

45. The owner/operator shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Compliance and Enforcement Division Policies & Procedures Manual. (Basis: Regulation 2, Rule 1, Section 403)

46. The owner/operator shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Basis: Regulation 2, Rule 1, Section 403, Regulation 2, Rule 6, Section 501)

47. The owner/operator shall notify the District and the CEC CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Compliance and Enforcement Division within 96 hours of the violation of any permit condition. (Basis: Regulation 2, Rule 1, Section 403)

48. The owner/operator shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall comply with the District Manual of Procedures, Volume IV, Source Test Policy and Procedures, and shall be subject to BAAQMD review and approval, except that the facility shall provide four sampling ports that are at least 6 inches in diameter in the same plane of each gas turbine stack (P-1, P-2). (Basis: Regulation 1, Section 501)

49. Within 180 days of the issuance of the Authority to Construct for the OGS, the owner/operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous emission monitors, sampling ports, platforms, and source tests required by Parts 24 through 28, and 38. The owner/operator shall conduct all source testing and monitoring in accordance with the District approved procedures. (Basis: Regulation 1, Section 501)

50. The owner/operator shall ensure that the OGS complies with the continuous emission monitoring requirements of 40 CFR Part 75. (Basis: Regulation 2, Rule 7)