

**Bay Area Air Quality Management District**

939 Ellis Street  
San Francisco, CA 94109  
(415) 771-6000

**Permit Evaluation  
and  
Statement of Basis  
for  
RENEWAL and SIGNIFICANT REVISION of  
MAJOR FACILITY REVIEW PERMIT**

**for  
City of Santa Clara, Electric Department  
Facility #A0621**

**Facility Address:**  
524 Robert Avenue  
Santa Clara, CA 95050

**Mailing Address:**  
1500 Warburton Avenue  
Santa Clara, CA 95050

Application Engineer: Brenda Cabral  
Site Engineer: Madhav Patel

Applications: 21654, 23709

January 2012

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## **Title V Statement of Basis**

### **A. Background**

The City of Santa Clara, Electric Department is a major facility subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Part 70 of Title 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, "Major Facility Review". It is a major facility because it has the "potential to emit," (PTE) of more than 100 tons per year of a regulated air pollutant, carbon monoxide. It is not a major source of greenhouse gases. PTE is defined in BAAQMD Rule 2-6-218.

Major Facility Operating permits (Title V permits) must meet federal specifications, which are set forth in 40 CFR Part 70 and incorporated in BAAQMD Regulation 2, Rule 6. The permits must contain all applicable requirements (as defined in BAAQMD Regulation 2-6-202), monitoring requirements, recordkeeping requirements, and reporting requirements for that facility. The permit holders must submit reports of all monitoring at least every six months and compliance certifications at least every year.

In the Bay Area, state and District requirements are also applicable requirements and are included in the permit. Some of these requirements are federally enforceable and others are not federally enforceable. All applicable requirements are contained in Sections I through VI of the permit.

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit. The identifier for this facility is A0621.

Pursuant to Regulation 2, Rule 6, section 416, the District has reviewed the terms and conditions of this Major Facility Review permit and determined that they are still valid and correct. This review included an analysis of applicability determinations for all sources, including those that have been modified or permitted since the issuance of the initial Major Facility Review Permit. The review also included an assessment of all monitoring in the permit for sufficiency to determine compliance.

This facility received its initial Title V permit on March 22, 2000. The permit was renewed on August 30, 2005. This application for permit renewal was submitted by the City of Santa Clara on February 25, 2010. The current permit expired on August 30, 2010, but all of its provisions will remain in effect until the District takes final action on the permit renewal. The facility has not added any equipment since the original issuance.

The facility did apply to relax a monitoring requirement through Applications 23708 and 23709 on August 31, 2011. The facility has been obligated to perform annual source tests on the turbines and duct burners. For the past seven years, the facility has not been firing the duct burners due to a low demand for steam. Therefore, the facility has fired the duct burners for the sole purpose of testing them every year. The facility requested an amendment to the condition such that source tests would be required only if the duct burners had been fired since the last

source test on the turbines. This amendment to the District permit was issued on November 10, 2011 pursuant to Application 23708. Annual emissions will be reduced slightly because the duct burners will not be fired solely for source testing. The permit evaluation for Application 23708 is attached in Appendix C.

The facility also requested the same change to the Title V permit through Application 23709. This amendment is considered a significant revision as defined by BAAQMD Regulation 2-6-226.3 because it is a relaxation of monitoring. Therefore, the permit must be revised before the facility can reduce the frequency of source testing of the duct burners. The District is proposing the significant revision together with the proposal for the renewal of the Title V permit.

The District has also updated the permit to incorporate current BAAQMD regulations, requirements and standards and if applicable, has corrected errors in the previous permit. Deletions in the permit are clearly shown in strikeout format and new language is underlined.

## **B. Facility Description**

The primary business of the City of Santa Clara, Electric Department is the production of steam and electricity at the Cogeneration Plant Facility. The facility consists of two Allison 501-KB Combustion Turbines (S-1, S-2) used to drive two 3-phase 3.5 MW electric generators. Waste heat from the turbines is supplied to two Heat Recovery Steam Generators, the steam from which is sold to an adjoining industrial customer, California Paperboard. The Supplemental Duct Burners (S-3, S-4) provide additional steam when needed.

In 2004, the facility declared that the emissions for the previous year were as follows:

<u>Pollutant</u>	<u>Emissions</u>
Particulate	5.75 tpy
Precursor Organics	17.3 tpy
NOx	61.7 tpy
SO2	0.234 tpy
CO	47.3 tpy
Benzene	0.019 tpy
Formaldehyde	4.02 tpy

In 2010, the facility declared that the emissions for the previous year were as follows:

<u>Pollutant</u>	<u>Emissions</u>
Particulate	5.34 tpy
Precursor Organics	19.7 tpy
NOx	57.2 tpy
SO2	0.218 tpy
CO	43.8 tpy
Benzene	0.0183 tpy
Formaldehyde	3.72 tpy

These variations between 2004 and 2010 are indicative of normal variations in throughput. The District considers that the facility has not had a significant increase or decrease in its emissions since the renewal of the Title V permit in 2005.

Greenhouse gases (GHG) became regulated air pollutants for the purposes of the Title V permit on January 2, 2011. While the facility is a source of GHG, it is not a major source of GHG, which is a source that has a potential to emit of 100,000 CO<sub>2</sub>e (carbon dioxide equivalents) per year.

The potential to emit GHG is calculated as follows. The GHG emissions in this case are based on the combustion emissions. The emission factors for natural gas are found in 40 CFR 98, Tables C-1 and C-2. They are:

CO <sub>2</sub> :	117 lb/MMbtu
CH <sub>4</sub> :	0.0022 lb/MMbtu
N <sub>2</sub> O:	0.00022 lb/MMbtu

The facility capacity is 150.2 MMbtu/hr. The potential to emit for each GHG pollutant if the plant were to operate at full capacity for 8,760 hr/yr is:

CO <sub>2</sub> :	76,972 tpy
CH <sub>4</sub> :	1.45 tpy
N <sub>2</sub> O:	0.145 tpy

The CH<sub>4</sub> and N<sub>2</sub>O masses are multiplied by the following factors found in 40 CFR 98, Table A-1 because their effect on global warming is higher than the effect of CO<sub>2</sub> on global warming. The resulting number is the CO<sub>2</sub>e (carbon dioxide equivalents) number.

	Global Warming Potential Factor	CO <sub>2</sub> e
CH <sub>4</sub> :	21	30.45
N <sub>2</sub> O:	310	44.95

The total CO<sub>2</sub>e, adding CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O is 76,687 tons per year.

#### Relationship with California Paperboard

The owner/operator for the facility has stated that it exists to produce steam for California Paperboard. Plant 621 is located adjacent to California Paperboard. Steam lines run from Plant 621 to Plant 9010. Because Plant 621 appeared to be a support facility for Plant 9010, the District investigated the relationship between the two plants.

Support facilities can be considered part of a primary facility under certain circumstances. If California Paperboard was part of the facility, or vice versa, it would be considered part of a major facility and would be required to apply for a Major Facility Review permit. It could be subject to more onerous offset requirements and it could be subject to the Federal Prevention of Significant Deterioration program.

Following is an analysis of the issue.

In brief, the facts here are as follows. Pursuant to a contract, California Paperboard purchases steam from the facility. The steam is delivered via a steam pipe that connects the two operations.

California Paperboard purchases its power from the grid, which is operated by the City of Santa Clara - Silicon Valley Power and which receives power from numerous sources, including this facility. There is no direct access to power for California Paperboard from this facility. California Paperboard has the capability produce steam on its own, but chooses to purchase it from City of Santa Clara.

At present, California Paperboard purchases approximately 65-70% of the steam produced by the facility; the remaining 30% of steam is wasted. Also, at present, the facility uses approximately 59% of the natural gas it purchases to create electricity, and 41% of the gas to produce steam.

California Paperboard and the facility share no employees, directors, shareholders or other ownership. They share no administrative functions. City of Santa Clara-Electric Department is a department of the City of Santa Clara. California Paperboard and the facility each are responsible for their own air pollution control equipment and liabilities. City of Santa Clara's employees have made statements to the effect that it would not be located in its present location "but for" the fact that California Paperboard is located next door and that if California Paperboard ceased to exist so would this cogeneration facility.

The PSD, Title V, and District 2-6 regulations define "major source" as all sources:

- 1) located on contiguous or adjacent property;
- 2) under common control; and
- 3) belonging to the same "industrial grouping."

Each factor must be met for California Paperboard and this facility to be considered the same facility or major source. EPA guidance has expanded on the third factor, whether the sources belong to the same industrial grouping, providing that a "support facility," one that typically conveys, stores, or otherwise assists in the production of the principle product should be considered part of the same source classification as the primary facility and thus satisfy the belonging to the same industrial grouping factor.

Here, the first factor is clearly met. California Paperboard and City of Santa Clara are located on adjacent properties, though they are not co-located. The third factor is also probably met, under the support facility test. This City of Santa Clara facility is likely a support facility for California Paperboard. It is not necessary to thoroughly analyze the third factor, however, because the second factor is not met.

California Paperboard and the facility are not under common control. Common control most typically exists when there is some form of corporate relationship between the two sources at issue. Here, California Paperboard is privately owned and City of Santa Clara is publicly owned; there is no corporate relationship. Absent a corporate relationship, EPA guidance states that there is a presumption of common control when one company locates on another's land. *See* Letter to Peter R. Hamlin from William A. Spratlin, September 18, 1995. Although City of Santa Clara is not located on California Paperboard's land, the analysis one would undertake on the presumption is instructive here. To overcome the presumption, one must examine how the companion facilities interact with one another, considering factors such as (1) do the facilities share a common workforce, security force, officers, board members; (2) do the facilities share equipment, other property, or pollution control equipment and what does the contract specify

with regard to pollution control responsibilities of the contractee; (3) do the facilities share payroll, benefits, or other administrative functions; (4) do the facilities share intermediates, products, byproducts or other manufacturing equipment and can the new facility purchase raw materials and sell products or byproducts to other customers; (5) who accepts responsibility for compliance with air quality control requirements; (6) what is the dependency of one facility on the other, if one shuts down: what are the limitations on the other to pursue outside business interests; and (7) does one operation support the other? These are screening questions; if the facilities respond in positive to one of the major indicators of control (management structures, plant managers, payroll, and other administrative functions), then there is most likely common control.

Here, not only are the facilities not located on the same land, but also none of the major indicators of control are present. The facilities do not share a common workforce, administrative functions, management or equipment (beyond the steam distribution equipment). While the facilities support one another, there is no dependency. If one shuts down, the other can still function and is free to pursue outside business interests. California Paperboard and City of Santa Clara are each responsible separately for compliance with air regulations. Thus the Spratlin letter factors support a conclusion that there is no common control here.

A number of additional EPA letters on common control were reviewed, and in those that are most similar to the fact pattern here no common control was found. Without common control, the 3-part test to establish that two facilities should be treated as one is not met and thus the District has determined that the two plants are considered to be two separate facilities.

### **C. Permit Content**

The permit includes a section entitled Permit Content, which contains eleven sections, listed by roman numeral, that set forth the permit's conditions, requirements and standards. A summary of the legal and factual basis for the permit's contents follows. The summary discusses each of the permit's sections in the same order as they are presented in the permit. Changes to the standard permit text have been made since the last renewal of the Title V Permit for this site was issued. These changes are reflected in the new proposed permit in strikeout/underline format.

#### **I. Standard Conditions**

This section contains administrative requirements and conditions that apply to all permitted facilities. If the Facility must also comply with Title IV (Acid Rain) requirements for certain fossil-fuel fired electrical generating facilities or with the accidental release (40 CFR § 68) programs, this Section will include a standard condition pertaining to these programs also. Many of the standards conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

The standard conditions also contain references to BAAQMD Regulation 1, "General Provisions", and Regulation 2, "Permits".

Changes to permit:

- The dates of adoption and approval of rules in Standard Condition 1.A have been updated.
- The following language was added as Standard Condition I.B.12: “The permit holder is responsible for compliance, and certification of compliance, with all conditions of the permit, regardless whether it acts through employees, agents, contractors, or subcontractors. (Regulation 2-6-307).” The purpose is to reiterate that the Permit Holder is responsible for ensuring that all activities at the facility comply with all applicable requirements.

## **II. Equipment**

This section of the permit lists all of the Facility’s permitted and significant sources. Each source is identified by an S and a number (e.g., S-24).

Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302. The Facility has four permitted sources.

BAAQMD Rule 2-6-239 defines “significant sources” as those sources that have a PTE more than 2 tons per year of a “regulated air pollutant,” as defined in BAAQMD Rule 2-6-222, or 400 pounds per year of a “hazardous air pollutant,” as defined in BAAQMD Rule 2-6-210. This facility has no significant sources that are not otherwise permitted.

The Equipment Section is part of the facility description. This Section contains information necessary for applicability determinations, such as fuel types and contents or sizes of tanks. This information is part of the factual basis of the permit.

Each of the permitted sources has previously been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with State law and the District’s regulations. The capacities in the permitted sources table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and BAAQMD Regulation 2-1-403. An exceedance of any of these capacities is a violation of BAAQMD Regulations.

The facility consists of two Allison 501-KB Combustion Turbines (S-1, S-2) used to drive two 3-phase 3.5 MW electric generators. Waste heat from the turbines is supplied to two Heat Recovery Steam Generators, the steam from which is sold to an adjoining industrial customer, California Paperboard. The Supplemental Duct Burners (S-3, S-4) provide additional steam when needed.

### Changes to permit:

None.

## **III. Generally Applicable Requirements**

This section of the permit lists requirements that generally apply to all sources at a facility, including insignificant sources and portable equipment that may not require a District permit. If a generally applicable requirement applies specifically to a source that is permitted or significant, the standard will also appear in Section IV and the monitoring for that requirement will appear in Sections IV and VII of the permit. Parts of this section apply to



all facilities (e.g., particulate, architectural coating, odorous substance, and sandblasting standards). In addition, this Section includes standards that apply to sources that are insignificant or that do not require a permit to operate at a facility (e.g., refrigeration units that use more than 50 pounds of an ozone-depleting compound) are placed in this section.

Changes to permit:

Table III has been updated to add rules and requirements to conform to the current District standard. Generally applicable requirements that were excluded inadvertently in the initial Title V permit were added. In addition, SIP (State Implementation Plan) rules were added. When the District amends a rule that is in the SIP, the SIP rule remains the same until it formally updated by EPA. Therefore, there are two versions of the rule with which facilities must comply.

- SIP 2-1-429, Federal Emissions Statement
- BAAQMD Regulation 2, Rule 5, New Source Review for Toxic Air Contaminants
- BAAQMD Regulation 6, Particulate Matter and Visible Emissions, was renumbered to Regulation 6, Rule 1, and was renamed as “Particulate Matter, General Requirements.
- SIP Regulation 6, Particulate Matter and Visible Emissions, was added because the District’s particulate regulation was renumbered and renamed and is no longer in the SIP (State Implementation Plan).
- SIP Regulation 8, Rule 2, Miscellaneous Operations
- SIP Regulation 8, Rule 3, Architectural Coatings
- BAAQMD Emulsified and Liquid Asphalts
- SIP Regulation 8, Rule 40, Aeration of Contaminated Soil and Removal of Underground Storage Tanks
- SIP Regulation 8, Rule 47, Air Stripping and Soil Vapor Extraction Operations
- BAAQMD Regulation 9, Rule 1, Sulfur Dioxide
- SIP Regulation 9, Rule 1, Sulfur Dioxide
- California Health and Safety Code Section 93116 et seq., Air Toxics Control Measure for Portable Engines Rated at 50 Horsepower or over
- 40 CFR Part 61, Subpart M, National Emission Standards for Hazardous Air Pollutants – National Emission Standard for Asbestos
- 40 CFR Part 82, Protection of Stratospheric Ozone

The dates of adoption or approval of the rules and their "federal enforceability" status in Table III have also been updated.

**IV. Source-Specific Applicable Requirements**

This section of the permit lists the applicable requirements that apply to permitted or significant sources. These applicable requirements are contained in tables that pertain to one or more sources that have the same requirements. The order of the requirements is:

1. District Rules
2. SIP Rules (if any) are listed following the corresponding District rules. SIP rules are District rules that have been approved by EPA for inclusion in the California State Implementation Plan. SIP rules are “federally enforceable” and a “Y” (yes) indication will appear in the “Federally Enforceable” column. If the SIP rule is the current District rule, separate citation of the SIP rule is not necessary and the “Federally Enforceable”

column will have a “Y” for “yes”. If the SIP rule is not the current District rule, the SIP rule or the necessary portion of the SIP rule is cited separately after the District rule. The SIP portion will be federally enforceable; the non-SIP version will not be federally enforceable, unless EPA has approved it through another program.

3. Other District requirements, such as the Manual of Procedures, as appropriate.
4. Federal requirements (other than SIP provisions)
5. BAAQMD permit conditions. The text of BAAQMD permit conditions is found in Section VI of the permit.
6. Federal permit conditions. The text of Federal permit conditions, if any, is found in Section VI of the permit.

Section IV of the permit contains citations to all of the applicable requirements for each source. The text of the requirements is found in the regulations, which are readily available on the District’s or EPA’s websites, or in the permit conditions, which are found in Section VI of the permit. All monitoring requirements are cited in Section IV. Section VII is a cross-reference between the limits and monitoring requirements. A discussion of monitoring is included in Section C.VII of this permit evaluation/statement of basis.

### **Complex Applicability Determinations**

#### Combined Emissions

Exhaust gases from the Gas Turbines S-1 and S-2 are combined with those from the Duct Burners S-3 and S-4 (e.g. S-1/S-3 and S-2/S-4) and cannot be separated for the purpose of determining compliance with individual emissions limits. In accordance with BAAQMD Regulation 1-107, such combined emissions shall be subject to the most stringent applicable limitations and requirements. As a result of this determination, the applicable requirements for the Duct Burners are largely the same as those for the Gas Turbines.

#### NSPS and Determination of NSPS NO<sub>x</sub> Limit

Per Section 60.330, the turbines are subject to 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, because they were built after October 3, 1977 and the capacity of each turbine is larger than 10 MMbtu/hr.

Per Section 60.4305, the turbines are not subject to 40 CFR 60, Subpart KK, Standards of Performance for Stationary Combustion Turbines, because they were built before February 8, 2005.

The NO<sub>x</sub> limit (STD) in Subpart GG is determined by the following equation:

$$\text{STD} = 0.0150 \frac{(14.4)}{Y} \text{ NO}_x \text{ \% by volume @ 15\% excess oxygen (dry)}$$

where:

Y = manufacturer’s rated heat rate at manufacturer’s rated peak load (kilojoules per watt-hour). The value of Y shall not exceed 14.4 kilojoules per watt-hour.

The Gas Turbines S-1 and S-2 each have a rated heat input of 55.1 MMBTU/hr (58,086,420 kilojoules/hr) and a rated peak load of 3,800,000 watts. Therefore, for S-1 and S-2,  $Y = 15.29$  kilojoules per watt-hour. Since the actual value of Y exceeds 14.4, the default value of 14.4 must be used. STD then equals 0.0150 % (equivalent to 150 ppmv) @ 15% O<sub>2</sub> (dry).

The SO<sub>2</sub> limit is the same for all turbines. NSPS Subpart GG only has NO<sub>x</sub> and SO<sub>2</sub> standards.

#### Acid Rain

In accordance with 40 CFR 72.6 (b)(2) the facility is not subject to the requirements of 40 CFR 72 “Acid Rain Program” because the power generation units commenced commercial operation prior to November 15, 1990 and they have nameplate capacities below 25 MWe.

#### NESHAP for Stationary Combustion Turbines

The Gas Turbines S-1 and S-2 are not subject to 40 CFR 63 Subpart YYYYY “National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines” because the facility is not a major source of hazardous air pollutants (HAPs).

#### 40 CFR 64, Compliance Assurance Monitoring (CAM)

The applicability of CAM must be considered because S-1 and S-2, Turbines, have water injection for NO<sub>x</sub> control, which is considered a control device by the regulation, and the turbines also have federally enforceable NO<sub>x</sub> limits. The standard applies for each source that has a pre-control potential to emit that is higher than the major source threshold, which is 100 tons per year for NO<sub>x</sub> in the Bay Area. The potential to emit for each turbine is less than the threshold as shown in the calculation below. The turbines have a capacity of 55.1 MMbtu/hr. The uncontrolled emission factor is 0.32 lb NO<sub>x</sub>/MMbtu, from Table 3.1.1 in AP-42 Chapter 3.1. The turbines are allowed to run 8760 hours per year.

$$55.1 \text{ MMbtu/hr} \times 8760 \text{ hr/yr} \times 0.32 \text{ lb NO}_x/\text{MMbtu} \times 1 \text{ ton}/2000 \text{ lb} = 77.2 \text{ ton/yr}$$

Since the uncontrolled emissions of NO<sub>x</sub> are less than 77.2 tons/yr at each turbine, the turbines are not subject to CAM.

#### Changes to permit:

- BAAQMD Regulation 6, Particulate Matter and Visible Emissions, was renumbered to Regulation 6, Rule 1, and was renamed as “Particulate Matter, General Requirements.
- SIP Regulation 6, Particulate Matter and Visible Emissions, was added because the District’s particulate regulation was renumbered and renamed and is no longer in the SIP (State Implementation Plan).
- BAAQMD Regulation 9, Rule 9, amendments adopted on December 6, 2006, were added.
- SIP Regulation 9, Rule 9, was added because the District’s amendments are not in the SIP.
- As discussed in Section A of this statement of basis, Condition 14194 was revised to waive the annual source test requirement for the duct burners in any year that the duct burners were not fired. This revision was evaluated through Application 23708, which is attached in Appendix C and forms part of this statement of basis.

## **V. Schedule of Compliance**

All major facility review permits must include a schedule of compliance. BAAQMD Rule 2-6-409.10 requires the schedule of compliance to contain the following elements:

- 10.1 A statement that the facility shall continue to comply with all applicable requirements with which it is currently in compliance;
- 10.2 A statement that the facility shall meet all applicable requirements on a timely basis as requirements become effective during the permit term; and
- 10.3 If the facility is out of compliance with an applicable requirement at the time of issuance, revision, or reopening, the schedule of compliance shall contain a plan by which the facility will achieve compliance. The plan shall contain deadlines for each item in the plan. The schedule of compliance shall also contain a requirement for submission of progress reports by the facility at least every six months. The progress reports shall contain the dates by which each item in the plan was achieved and an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.”

Based on available information, the District has determined that the facility is in compliance with all applicable requirements. Therefore, the permit’s schedule of compliance contains the provisions set forth in Regulations 2-6-409.10.1 and 2-6-409.10.2 only.

### Changes to permit:

None.

## **VI. Permit Conditions**

During the Title V permit development, the District has reviewed the existing permit conditions, deleted the obsolete conditions, and, as appropriate, revised the conditions for clarity and enforceability. Each permit condition is identified with a unique numerical identifier, up to five digits.

When necessary to meet Title V requirements, additional monitoring, recordkeeping, or reporting has been added to the permit.

All changes to existing permit conditions are clearly shown in “strike-out/underline” format in the proposed permit. Subject to consideration of comments received, the final permit will include all underlined language. The struck language will have been deleted.

The existing permit conditions are derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). Permit conditions may also be imposed or revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 et seq., an order of abatement pursuant to H&SC § 42450 et seq., or as an administrative revision initiated by District staff. After issuance of the Major Facility Review permit renewal, permit conditions may be revised, in accordance with the procedures set forth in Regulation 2, Rule 6, Major Facility Review.

The regulatory basis is listed following each condition. The regulatory basis may be a rule or regulation. The District is also using the following terms for regulatory basis:

- **BACT:** This term is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.
- **Cumulative Increase:** This term is used for a condition imposed by the APCO that limits a source's operation to the operation described in the permit application pursuant to BAAQMD Regulation 2-1-403.
- **Offsets:** This term is used for a condition imposed by the APCO to ensure compliance with the use of offsets for the permitting of a source or with the banking of emissions from a source pursuant to Regulation 2, Rules 2 and 4.
- **PSD:** This term is used for a condition imposed by the APCO to ensure compliance with a Prevention of Significant Deterioration permit issued pursuant to Regulation 2, Rule 2.
- **TRMP:** This term is used for a condition imposed by the APCO to ensure compliance with limits that arise from the District's Toxic Risk Management Policy.

Changes to permit:

The bases for several conditions have been amended due to rule changes.

As discussed in Section A of this statement of basis, Condition 14194 was revised to waive the annual source test requirement for the duct burners in any year that the duct burners were not fired. This revision was evaluated through Application 23708, which is attached in Appendix C and forms part of this statement of basis. Because the revision is a relaxation in monitoring, the condition states that the relaxation is not applicable until the Title V permit is revised. The revision will be proposed in this action and will be applicable when this renewal is issued.

## **VII. Applicable Limits and Compliance Monitoring Requirements**

This section of the permit is a summary of numerical limits and related monitoring requirements for each source. The summary includes a citation for each monitoring requirement, frequency of monitoring, and type of monitoring. The applicable requirements for monitoring are completely contained in Sections IV, Source-Specific Applicable Requirements, and VI, Permit Conditions, of the permit.

The District imposes monitoring requirements that are necessary to assure the facilities meet their applicable emissions limits. This District establishes the monitoring requirements for facilities' initial permits and renewal permits based on a balancing of several different factors including, but not limited to: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of variability in the operation and in the control device, if there is one, 3) the potential severity of impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

As noted above, evaluation of this permit renewal’s monitoring requirements is based on the same factors that were applied by the District in developing monitoring for applicable requirements. It follows that, although Title V calls for a re-examination of all monitoring, there is a presumption that these factors have been appropriately balanced and incorporated in the District’s prior rule development and/or permit issuance. It is possible that, where a rule or permit requirement has historically had no monitoring associated with it, no monitoring may still be appropriate in the Title V permit if, for instance, there is little likelihood of a violation. Compliance behavior and associated costs of compliance are determined in part by the frequency and nature of associated monitoring requirements. As a result, the District will generally revise the nature or frequency of monitoring only when it can support a conclusion that existing monitoring is inadequate.

**Particulate Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
<b>GAS TURBINES W/WATER INJECTION: S1, S2</b>	BAAQMD Regulation 6-1-301 and SIP Regulation 6-301	Ringelmann 1.0	None
	BAAQMD Regulation 6-1-310 and SIP Regulation 6-310	0.15 gr/dscf	None
	BAAQMD Regulation 6-1-310.3 and SIP Regulation 6-310.3	0.15 gr/dscf @ 6% O2	None
<b>-IDUCT BURNERS: S3, S4</b>	BAAQMD Regulation 6-1-301 and SIP Regulation 6-301	Ringelmann 1.0	None
	BAAQMD Regulation 6-1-310 and SIP Regulation 6-310	0.15 gr/dscf	None
	BAAQMD Regulation 6-1-310.3 and SIP Regulation 6-310.3	0.15 gr/dscf @ 6% O2	None

**PM Discussion:**

**S1, S2: Gas Turbines; 55.1 MMBTU/hr, Natural Gas Fired**

The Gas Turbines S1 and S2 are required by a federally enforceable permit condition to fire only natural gas. Because visible emissions are not normally associated with proper natural gas combustion, periodic monitoring for Ringelmann limits would not be appropriate for the turbines.

BAAQMD Regulation 6-1-310.3 limits PM emissions from “heat transfer operations” to 0.15 gr/dscf @ 6% O2. This compares to a PM10 factor of 0.042 lb/MMBTU from AP-42 Table 3.1-2 “Emission Factors For Large Uncontrolled Gas Turbines”. For a typical

natural gas fuel with a gross heating value of 1000 BTU/scf, 0.15 gr/dscf @ 6% O<sub>2</sub> can be converted to lb/MMscf (natural gas fired) as follows:

From 40 CFR 60, Appendix A, Method 19, the stoichiometric dry natural gas combustion factor of 8.710 dscf (combustion products)/scf (natural gas) can be derived from Table 19-1. At 6% excess O<sub>2</sub>, this factor becomes:

$$8.710 \times [21\% / (21\% - 6\%)] = 12.194 \text{ dscf (combustion.products)/scf (natural gas(n.g.))}$$

Therefore, the conversion of 0.15 gr/dscf @ 6% O<sub>2</sub> to lb/MMscf (n.g.) is:

$$(12.194 \text{ dscf/scf-ng}) \times (0.15 \text{ gr/dscf}) \times (\text{lb}/7000 \text{ gr}) \times (1,000,000 \text{ scf-ng/MMscf-ng})$$

$$= 261.3 \text{ lb/MMscf natural gas (0.261 lb/MMBTU)}$$

Since this factor is so far above the AP-42 factor of 0.042 lb/MMBTU, the addition of periodic monitoring to demonstrate compliance with this limit would not be appropriate.

**S3, S4: Duct Burners; 20 MMBTU/hr, Natural Gas Fired**

The case for not monitoring particulate emissions from the duct burners is the same as discussed for the Gas Turbines; natural gas combustion does not produce visible emissions, and the AP-42 emission factor is far below the Regulation 6-310.3 standard. EPA AP-42 Table 1.4-1 “Emission Factors For Particulate Matter (PM) From Natural Gas Combustion” lists a PM factor of 6.2 lb/MMscf (natural gas) for small industrial boilers (analogous to duct burners). This is well below the converted Regulation 6-310.3 standard of 261.3 lb/MMscf (natural gas).

**SO<sub>2</sub> Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally Enforceable Emission Limit</b>	<b>Monitoring</b>
<b>GAS TURBINES W/WATER INJECTION: S1, S2</b>	BAAQMD 9-1-301	Ground level concentrations: 0.5 ppm for 3 consecutive minutes, 0.25 ppm averaged over 60 consecutive minutes, 0.05 ppm averaged over 24 hours	None
	BAAQMD 9-1-302	300 ppm (dry) general emission limitation	None
	40 CFR 60 Subpart GG 60.333 (b)	0.8% (wt) fuel sulfur content	None
<b>DUCT BURNERS: S3, S4</b>	BAAQMD Regulation 9-1-301	Ground level concentrations: 0.5 ppm for 3 consecutive minutes, 0.25 ppm averaged over 60 consecutive minutes, 0.05 ppm averaged over 24 hours	None

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
	BAAQMD 9-1-302	300 ppm (dry) general emission limitation	None

**SO2 Discussion:**

**S1, S2: Gas Turbines; 55.1 MMBTU/hr, Natural Gas Fired**

**S3, S4: Duct Burners; 20 MMBTU/hr, Natural Gas Fired**

BAAQMD Condition #14194, part 1 requires PUC grade natural gas to be used at all combustion sources at the facility. PUC standard natural gas can have no more than 5 grains total sulfur per 100 standard cubic feet (170 ppm, 0.017% by weight). In accordance with 40 CFR 60.334(h)(3)(i), gaseous fuel sulfur monitoring is not required if the gas quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the gaseous fuel show that the fuel has a sulfur content equal to or less than 20 grains total sulfur per 100 standard cubic feet. Therefore, the exclusive use of PUC standard gas will eliminate the need to monitor fuel sulfur content for 40 CFR 60 Subpart GG.

**BAAQMD Regulation 9-1-301**

Area monitoring to demonstrate compliance with the ground level SO2 concentration requirements of Regulation 9-1-301 is at the discretion of the APCO (per BAAQMD Regulation 9-1-501). This facility does not have equipment that emits large amounts of SO2 and therefore is not required to have ground level monitoring by the APCO.

**BAAQMD Regulation 9-1-302**

All natural gas combustion sources at the facility are subject to the 300 ppm (dry) SO2 emission limit in District Regulation 9-1-302. In EPA's June 24, 1999 agreement with CAPCOA and ARB, "Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", EPA has agreed that natural-gas-fired combustion sources do not need additional monitoring to verify compliance with BAAQMD Regulation 9-1-302, since violations of the regulation are unlikely. Therefore, no monitoring is necessary for this requirement.



### NOx Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
<b>GAS TURBINES W/WATER INJECTION: S1, S2 DUCT BURNERS: S3, S4</b>	BAAQMD 9-9-301.1, 9-1-301.2, and SIP 9-9-301.1	42 ppmv @ 15% O <sub>2</sub> (dry)	Annual source test, water-to-fuel monitoring
	NSPS Subpart GG 60.332 (a)(2)	150 ppmv @ 15% O <sub>2</sub> (dry)	water-to-fuel monitoring
	Condition #14194, parts 4, 5	42 ppmv @ 15% O <sub>2</sub> (dry)	Annual source test, water-to-fuel monitoring

The turbines are subject to continuous water-to-fuel monitoring, which is appropriate monitoring for this size of turbine.

Compliance with the NOx limit is also verified with annual source testing. A survey of the results since 2005 shows compliance with the NOx limits during testing.

#### Changes to permit:

- A note has been added at the beginning of the section to clarify that this section is a summary of the limits and monitoring, and that in the case of a conflict between Sections I-VI and Section VII, the preceding sections take precedence.
- BAAQMD Regulation 6, Particulate Matter and Visible Emissions, was renumbered to Regulation 6, Rule 1, and was renamed as “Particulate Matter, General Requirements.”
- SIP Regulation 6, Particulate Matter and Visible Emissions, was added because the District’s particulate regulation was renumbered and renamed and is no longer in the SIP (State Implementation Plan).
- BAAQMD Regulation 9, Rule 9, amendments adopted on December 6, 2006, were added.
- SIP Regulation 9, Rule 9, was added because the District’s amendments are not in the SIP.
- The monitoring for the sulfur limit in 40 CFR 60.333(b) was deleted because the standard does not require any monitoring if pipeline quality natural gas is used. The change was discussed in the statement of basis for the permit that was issued on August 30, 2005, but the change to this table was not made.
- As discussed in Section A of this statement of basis, Condition 14194 was revised to waive the annual source test requirement for the duct burners in any year that the duct burners were not fired. This revision was evaluated through Application 23708, which is attached in Appendix C and forms part of this statement of basis. The citation in Table VII-A for the source test requirement has been revised from “BAAQMD Condition #14194, part 9” to “BAAQMD Condition #14194, parts 9 and 10.”

### **VIII. Test Methods**

This section of the permit lists test methods that are associated with standards in District or other rules. It is included only for reference. In most cases, the test methods in the rules are source test methods that can be used to determine compliance but are not required on an ongoing basis. The test methods are not applicable requirements, unless a rule or permit condition requires such ongoing testing, in which case the requirement will also appear in Section IV of the permit.

#### Changes to permit:

The citation for the grain loading standard has been changed from BAAQMD Regulation 6-1-310 to BAAQMD Regulation 6-1-310.3 because the source is always used as a heat exchange source.

SIP Regulation 6-301 and 6-310 were added.

### **IX. Permit Shield**

The District rules allow two types of permit shields. The permit shield types are defined as follows: (1) A provision in a major facility review permit explaining that specific federally enforceable regulations and standards do not apply to a source or group of sources, or (2) A provision in a major facility review permit explaining that specific federally enforceable applicable requirements for monitoring, recordkeeping and/or reporting are subsumed because other applicable requirements for monitoring, recordkeeping, and reporting in the permit will assure compliance with all emission limits.

The second type of permit shield is allowed by EPA's White Paper 2 for Improved Implementation of the Part 70 Operating Permits Program. The District uses the second type of permit shield for all streamlining of monitoring, recordkeeping, and reporting requirements in Title V permits. The District's program does not allow other types of streamlining in Title V permits.

This facility has no permit shields.

The applicant has requested a shield from the following monitoring sections of NSPS, Subpart GG: 40 CFR 60.334(b)(2) and 40 CFR 60.334(c)(2). These were the requirements to monitor the nitrogen and sulfur content of the natural gas, and to report periods of excess SO<sub>2</sub> emissions. The NSPS was revised on July 8, 2004, and these requirements no longer apply to turbines that burn natural gas. Therefore, a permit shield was not considered for this permit.

### **X. Revision History**

The revision history section was updated. Application numbers have been added for each action.

## **XI. Glossary**

There are no changes to this permit.

### **D. Alternate Operating Scenarios:**

No Alternate Operating Scenario was requested for this facility.

### **E. Compliance Status:**

The District's Compliance and Enforcement staff reviewed the compliance status of the facility from August 30, 2005 to January 6, 2012 and has found it to be satisfactory. The compliance report is attached in Appendix A of this Statement of Basis. During this time period:

- Two Notices of Violation were issued.
- There were several monitor excesses and equipment breakdowns reported or documented by District staff. The details are in the compliance report.

The District did not receive any alleged complaints during this time period. The facility is not operating under a Variance or an Order of Abatement from the District Board, and no outstanding compliance issues were identified.

As part of the Title V renewal application, the responsible official for the facility certified that all equipment was operating in compliance with all applicable requirements on August 13, 2004.

### **F. Differences between the Application and the Proposed Permit:**

The City of Santa Clara submitted its Title V permit renewal application on February 25, 2010. That version is the basis for conditions, terms, and requirements of the proposed Major Facility Review permit.

The only differences between the application and the proposed permit are:

- The facility requested a permit shield against the monitoring requirements in 40 CFR 60.334(b)(2) and 40 CFR 60.334(c)(2) and the District did not include the shield in the permit.
- The District is proposing an amendment to Condition 14194 pursuant to Application 23709.

As discussed in Section C.IX of this Statement of Basis, the NSPS, Subpart GG, standard no longer requires monitoring of fuel sulfur and nitrogen for natural gas or reporting of hours with excess SO<sub>2</sub> emissions, so the permit shield is not necessary.

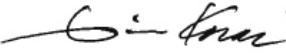
Application 23709 is discussed in Sections A, C.IV, VI, and VII of this statement of basis. The corresponding District Application 23708, is attached in Appendix C and forms part of this statement of basis.

**APPENDIX A**  
**BAAQMD COMPLIANCE REPORT**

**COMPLIANCE & ENFORCEMENT DIVISION**

**Inter-Office Memorandum**

January 6, 2012

TO:  JOHN CHILADAKIS – DIRECTOR OF ENGINEERING

FROM: BRIAN BATEMAN – DIRECTOR OF ENFORCEMENT *BB 1/9/12*

SUBJECT: REVIEW OF COMPLIANCE RECORD OF:

**CITY OF SANTA CLARA ELECTRIC DEPARTMENT SILICON VALLEY POWER;  
SITE # A0621**

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**Background**

This review was initiated as part of the District evaluation of an application by The City of Santa Clara Electric Department. Silicon Valley Power (Santa Clara Electric) for a Title V Permit Renewal. It is standard practice of the Compliance and Enforcement Division to undertake a compliance record review in advance of a renewal of a Title V Permit. The purpose of this review is to assure that any non-compliance problems identified during the prior five-year permit term have been adequately addressed, or, if non-compliance persists, that a schedule of compliance is properly incorporated into the Title V permit compliance schedule. In addition, the review checks for patterns of recurring violation that may be addressed by additional permit terms. Finally, the review is intended to recommend, if necessary, any additional permit conditions and limitations to improve compliance.

Santa Clara Electric is a power generation facility that uses natural-gas to fire two Gas Turbines with Water Injection Systems. A Continuous Monitoring System is in place for monitoring the water-to-fuel ratios necessary for compliance with the permit condition.

**Compliance Review**

Compliance records were reviewed for the time period from August 30, 2005 through January 6, 2012. The results of this review are summarized as follows.

**1. Violation History**

Staff reviewed Santa Clara Electric Annual Compliance Certifications and found no ongoing non-compliance and no recurring pattern of violations.

Staff also reviewed the District compliance records for the review period. During this period, Santa Clara Electric activities known to the District include:

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City of Santa Clara – SITE # A0621

Date

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District-issued two Notice of Violations (NOV's):

NOV#	Regulation	Date Occur	# of Days	Comments	Disposition
A51381	2-6-307	11/26/10	1	Low water to fuel ratio	pending
A51382	2-6-307	11/21/10	1	Low water to fuel ratio	pending
A51382	1-523.3	11/21/10	1	Late reporting	pending

NOV# A51381 was issued for a low water to fuel ratio based on the District permit condition #14194, Part 6: NOx emissions from each turbine shall be controlled at all times by water injection except during startup and shutdown. Water-to-fuel ratio shall be maintained in the range of 57% to 62% (weight basis) during all periods of operation.

NOV#A51382 was issued also for a low water to fuel ratio and for late report on their parametric monitoring for this violation.

## 2. Complaint History

The District received no air pollution complaints alleging Santa Clara Electric as the source.

## 3. Reportable Compliance Activity

Reportable Compliance Activity (RCA), also known as "Episode" reporting, is the reporting of compliance activities involving a facility as outlined in District Regulations and State Law. Reporting covers breakdown requests, indicated monitor excesses, pressure relief device releases, inoperative monitor reports and flare monitoring.

Within the review period, the District received twelve notifications for RCA's. Two NOV's were issued as a result of these RCA's.

The District received 12 notifications for RCA's.

Episode	Date Occur	# of Days	Comments	Disposition
05D39	12/29/07	1	Low resistivity alarm	Granted
05D40	12/29/07	1	Associated to Breakdown (BD) #05D39	Granted
05X11	11/26/10	1	Water injection problem	Denied/NOV#A51381
05X12	11/26/10	1	Assoc. to BD#05X11	Denied/NOV#A51381
05X13	11/21/10	1	Water injection problem	Denied/NOV#A51382
05X14	11/21/10	1	Assoc. to BD#05X13	Denied/NOV#A51382
05X16	12/1/10	1	Water flow meter	Granted
05X17	12/1/10	1	Water flow meter	Granted

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05Y00	1/7/11	1	Water resistivity sensor	Granted
05Y01	1/7/11	1	Assoc. to BD#05Y00	Granted
06B15	8/12/11	1	Lost water injection	Granted
06B16	8/12/11	1	Lost water injection	Granted

**4. Enforcement Agreements, Variances, or Abatement Orders**

There were no enforcement agreements, variances, or abatement orders for Santa Clara Electric review period.

**Conclusion**

Following its review of all available facility and District compliance records from August 30, 2005 through January 6, 2012, the District's Compliance and Enforcement Division has determined that Santa Clara Electric was in intermittent compliance from the initial permit period through the present. However, Santa Clara Electric has demonstrated no evidence of ongoing noncompliance and no recurring pattern of violations that would warrant consideration of a Title V permit compliance schedule for this facility.

Based on this review, the District has concluded that no schedule of compliance or change in permit terms is necessary beyond what is already contained in the facility's current Title V permit.

**APPENDIX B**

**GLOSSARY**



**ACT**

Federal Clean Air Act

**APCO**

Air Pollution Control Officer

**API**

American Petroleum Institute

**AP-42**

EPA publication: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources

**ARB**

Air Resources Board

**BAAQMD**

Bay Area Air Quality Management District

**BACT**

Best Available Control Technology

**BARCT**

Best Available Retrofit Control Technology

**C5**

An Organic chemical compound with five carbon atoms

**C6**

An Organic chemical compound with six carbon atoms

**CAA**

The federal Clean Air Act

**CAAQS**

California Ambient Air Quality Standards

**CAPCOA**

California Air Pollution Control Officers Association

**CEC**

California Energy Commission

**CEQA**

California Environmental Quality Act

**CEM**

A "continuous emission monitor" is a monitoring device that provides a continuous direct measurement of some pollutant (e.g. NOx concentration) in an exhaust stream.

**CFR**

The Code of Federal Regulations. 40 CFR contains the implementing regulations for federal environmental statutes such as the Clean Air Act. Parts 50-99 of 40 CFR contain the requirements for air pollution programs.

**CO**

Carbon Monoxide

**CO2**

Carbon Dioxide

**Cumulative Increase**

The sum of permitted emissions from each new or modified source since a specified date. Used to determine whether threshold-based requirements are triggered.

**District**

The Bay Area Air Quality Management District

**dscf**

Dry Standard Cubic Feet

**dscm**

Dry Standard Cubic Meter

**E 6, E 9, E 12**

Very large or very small number values are commonly expressed in a form called scientific notation, which consists of a decimal part multiplied by 10 raised to some power. For example, 4.53 E 6 equals  $(4.53) \times (10^6) = (4.53) \times (10 \times 10 \times 10 \times 10 \times 10 \times 10) = 4,530,000$ . Scientific notation is used to express large or small numbers without writing out long strings of zeros.

**EGT**

Exhaust Gas Temperature

**EPA**

The federal Environmental Protection Agency.

**Excluded**

Not subject to any District Regulations.

**FE, Federally Enforceable**

All limitations and conditions which are enforceable by the Administrator of the EPA including those requirements developed pursuant to 40 CFR Part 51, subpart I (NSR), Part 52.21 (PSD), Part 60, (NSPS), Part 61, (NESHAPs), Part 63 (HAP), and Part 72 (Permits Regulation, Acid Rain), and also including limitations and conditions contained in operating permits issued under an EPA-approved program that has been incorporated into the SIP.

**FP**

Filterable Particulate as measured by BAAQMD Method ST-15, Particulate.

**FR**

Federal Register

**GDF**

Gasoline Dispensing Facility

**GLC**

Ground level concentration.

**GLM**

Ground Level Monitor

**grains**

1/7000 of a pound

**HAP**

Hazardous Air Pollutant. Any pollutant listed pursuant to Section 112(b) of the Act. Also refers to the program mandated by Title I, Section 112, of the Act and implemented by both 40 CFR Part 63, and District Regulation 2, Rule 5.

**H2S**

Hydrogen Sulfide

**HHV**

Higher Heating Value. The quantity of heat evolved as determined by a calorimeter where the combustion products are cooled to 60F and all water vapor is condensed to liquid.

**LHV**

Lower Heating Value. Similar to the higher heating value (see HHV) except that the water produced by the combustion is not condensed but retained as vapor at 60F.

**Major Facility**

A facility with potential emissions of regulated air pollutants greater than or equal to 100 tons per year, greater than or equal to 10 tons per year of any single hazardous air pollutant, and/or greater than or equal to 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity as determined by the EPA administrator.

**MFR**

Major Facility Review. The District's term for the federal operating permit program mandated by Title V of the Act and implemented by District Regulation 2, Rule 6.

**MOP**

The District's Manual of Procedures.

**MSDS**

Material Safety Data Sheet

**MW**

Megawatts

**NA**

Not Applicable

**NAAQS**

National Ambient Air Quality Standards

**NESHAPs**

National Emission Standards for Hazardous Air Pollutants. Contained in 40 CFR Part 61.

**NMHC**

Non-methane Hydrocarbons

**NMOC**

Non-methane Organic Compounds (Same as NMHC)

**NO<sub>x</sub>**

Oxides of nitrogen.

**NSPS**

Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Act, and implemented by both 40 CFR Part 60 and District Regulation 10.

**NSR**

New Source Review. A federal program for pre-construction review and permitting of new and modified sources of air pollutants for which the District is classified "non-attainment". Mandated by Title I of the Clean Air Act and implemented by 40 CFR Parts 51 and 52 as well as District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

**O<sub>2</sub>**

The chemical name for naturally-occurring oxygen gas.

**Offset Requirement**

A New Source Review requirement to provide federally enforceable emission offsets at a specified ratio for the emissions from a new or modified source and any pre-existing cumulative increase minus any onsite contemporaneous emission reduction credits. Applies to emissions of POC, NO<sub>x</sub>, PM<sub>10</sub>, and SO<sub>2</sub>.

**Phase II Acid Rain Facility**

A facility that generates electricity for sale through fossil-fuel combustion and by virtue of certain other characteristics (defined in Regulation 2, Rule 6) is subject to Titles IV and V of the Clean Air Act.

**POC**

Precursor Organic Compounds

**PM**

Total Particulate Matter

**PM10**

Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns

**PSD**

Prevention of Significant Deterioration. A federal program for permitting new and modified sources of air pollutants for which the District is classified "attainment" of the National Air Ambient Quality Standards. Mandated by Title I of the Act and implemented by both 40 CFR Part 52 and District Regulation 2, Rule 2.

**SCR**

A "selective catalytic reduction" unit is an abatement device that reduces NOx concentrations in the exhaust stream of a combustion device. SCRs utilize a catalyst, which operates at a specific temperature range, and injected ammonia to promote the conversion of NOx compounds to nitrogen gas.

**SIP**

State Implementation Plan. State and District programs and regulations approved by EPA and developed in order to attain the National Air Ambient Quality Standards. Mandated by Title I of the Act.

**SO2**

Sulfur dioxide

**SO2 Bubble**

An SO2 bubble is an overall cap on the SO2 emissions from a defined group of sources, or from an entire facility. SO2 bubbles are sometimes used at refineries because combustion sources are typically fired entirely or in part by "refinery fuel gas" (RFG), a waste gas product from refining operations. Thus, total SO2 emissions may be conveniently quantified by monitoring the total amount of RFG that is consumed, and the concentration of H2S and other sulfur compounds in the RFG.

**SO3**

Sulfur trioxide

**THC**

Total Hydrocarbons (NMHC + Methane)

**therm**

100,000 British Thermal Unit

**Title V**

Title V of the federal Clean Air Act. Requires a federally enforceable operating permit program for major and certain other facilities.

**TOC**

Total Organic Compounds (NMOC + Methane, Same as THC)

**TRMP**

Toxic Risk Management Plan

**TSP**

Total Suspended Particulate

**TVP**

True Vapor Pressure

**VOC**

Volatile Organic Compounds

**Units of Measure:**

bhp	=	brake-horsepower
Btu	=	British Thermal Unit
g	=	grams
gal	=	gallon
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inches
max	=	maximum
m <sup>2</sup>	=	square meter
min	=	minute
MM	=	million
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scfm	=	standard cubic feet per minute
yr	=	year

**Symbols:**

<	=	less than
>	=	greater than
≤	=	less than or equal to
≥	=	greater than or equal to

**APPENDIX C**

Evaluation for Application 23708

**ENGINEERING EVALUATION  
CITY OF SANTA CLARA, SILICON VALLEY POWER  
PLANT #621-APPLICATION #23708  
560 ROBERT AVENUE  
SANTA CLARA, CA 95050**

**BACKGROUND:**

City of Santa Clara (Silicon Valley Power) has applied for a change of conditions for the following sources:

- S-3 Supplemental Duct Burner for source S-1; Make: Cohen; Model: GDB-20; Design Capacity: 20 MMBtu/hr; Permitted Capacity: 13.5 MMBtu/hr
- S-4 Supplemental Duct Burner for source S-2; Make: Cohen; Model: GDB-20; Design Capacity: 20 MMBtu/hr; Permitted Capacity: 13.5 MMBtu/hr

Silicon Valley Power has submitted the application to exempt the duct burners from annual source testing. The above duct burners are operated once a year during the source testing and are idle for rest of the year. Facility wants to keep the duct burners for the future use when they are needed to generate steam. Therefore, facility requested a change in the permit condition #14194 part #9.

The condition change is for source testing and will not affect rest of the requirements at source S-3 and S-4. Therefore, the emissions and the emission limits for both the duct burners will remain unchanged and will stay in effect as stated under condition #14194.

This change is a significant permit revision to the facility's Major Facility Review in accordance with BAAQMD Regulation 2-6-226.3 because the change is a relaxation of an applicable monitoring condition.

Since it is a significant permit revision, the facility will not be able to implement the change until the Major Facility Review permit is revised. This revision will be proposed together with the proposed renewal of the Major Facility Review permit.

**Permit Condition:**

Condition #14194 for the following sources

- S1, Gas Turbine with water injection
- S2, Gas Turbine with water injection
- S3, Supplemental Duct Burner
- S4, Supplemental Duct Burner

1. All combustion sources at this facility shall be fired exclusively with California Public Utilities Commission (PUC) quality natural gas. (Basis: BACT, 40 CFR 60.333)
2. Heat input for each turbine, S1 and S2, is limited to 55.1 MMBTU/hr. (Basis: Cumulative Increase)
3. Heat input for each supplemental duct burner, S3 and S4, is limited to 13.5 MMBTU/hr. (Basis: Cumulative Increase)

4. NOx emissions from each turbine, S1 or S2, shall not exceed 42 ppm, by volume in the exhaust, measured at 15% oxygen (dry basis), except during startup and shutdown. (Basis: Regulation 9-9-301.1)

5. NOx emissions from each turbine-supplemental duct burner combination, S1/S3 or S2/S4, shall not exceed 42 ppm by volume in the exhaust, measured at 15% oxygen (dry basis). The supplemental burners shall not operate during startup or shutdown. (Basis: Regulation 9-9-301.1)

6. NOx emissions from each turbine shall be controlled at all times by water injection except during startup and shutdown. Water-to-fuel ratio shall be maintained in the range of 57% to 62% (weight basis) during all periods of operation. (Basis: BACT)

7. In order to demonstrate compliance with Parts #2 and #3, the owner/operator of the Gas Turbines and Supplemental Duct Burners shall install and operate approved continuous fuel meters to monitor and record the amount of fuel heat input to each turbine and duct burner. (Basis: Cumulative Increase)

8. In order to demonstrate compliance with Part #6, the owner/operator of the Gas Turbines shall install and operate an approved continuous monitoring system to monitor and record the ratio of water-to-fuel being fired in each turbine. (Basis: 40 CFR 60.334)

9. In order to demonstrate compliance with NOx limits of Part #4, the owner/operator of the Gas Turbines S1 and S2 shall conduct annual source testing of each turbine (S1, S2) (Basis: Regulation 9-9-301.1)

All source testing shall be performed in accordance with the District's Manual of Procedures. The facility shall obtain prior approval from the District's Source Test Manager for the location of sampling ports and source testing procedures. All source test results shall be delivered to the District within 30 days of the date of the test. The time interval between source testing shall not exceed 15 months.

10. In order to demonstrate compliance with NOx limits of Part #5, the owner/operator of the Gas Turbines, S1 and S2, and duct burners S3 and S4 shall conduct annual source testing of each turbine-supplemental duct burners combination (S1/S3, S3/S4). This requirement shall be waived if the duct burners have not been fired since the last source test. (Basis: Regulation 2-6-503, 9-9-301.1)

All source testing shall be performed in accordance with the District's Manual of Procedures. The facility shall obtain prior approval from the District's Source Test Manager for the location of sampling ports and source testing procedures. All source test results shall be delivered to the District within 30 days of the date of the test. The time interval between source testing shall not exceed 15 months.

Note: Part 10 is not applicable until a significant revision of the Major Facility Review permit is issued pursuant to Application 23709.

11. The owner/operator of the Gas Turbines S1 and S2 and the Supplemental Duct Burners S3 and S4 shall keep records of the operation of this equipment as follows: (Basis: Cumulative Increase, 40 CFR 60.334)

- a. hours of operation of each turbine and supplemental burner
- b. monthly summary of fuel usage at each turbine and supplemental burner
- c. average fuel to water ratio at each turbine for each 24 hour period that the turbines are in operation

12. The owner/operator of the Gas Turbines S1 and S2 shall submit an excess emissions and monitoring systems performance report to the District and the U.S. Environmental Protection Agency on a semiannual basis. These reports shall be submitted as stipulated in Standard Condition I.F and shall include the following: (Basis: 40 CFR 60.7(c))

- a. the hours of operation of each turbine during the reporting period



- b. each one-hour period during which the average water-to-fuel ratio falls out of the range specified in Condition #6
- c. the date and time identifying each period during which the continuous monitoring system was inoperative and the nature of the system repairs or adjustments
- d. the average fuel consumption and turbine load conditions for each period when the water-to-fuel ratio was out of the specified range or the continuous monitoring system was inoperative Respective reports to the District and the EPA shall be addressed as follows:

Director of Compliance and Enforcement  
Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, CA 94109  
Attn: Title V Reports

Director of the Air Division  
USEPA, Region IX  
75 Hawthorne Street  
San Francisco, CA 94105  
Attn: Air-3

**RECOMMENDATION:**

Issue a change of condition for the following sources.

- S-3 Supplemental Duct Burner for source S-1; Make: Cohen; Model: GDB-20; Design Capacity: 20 MMBtu/hr; Permitted Capacity: 13.5 MMBtu/hr
- S-4 Supplemental Duct Burner for source S-2; Make: Cohen; Model: GDB-20; Design Capacity: 20 MMBtu/hr; Permitted Capacity: 13.5 MMBtu/hr

By: Madhav Patil  
Air Quality Engineering

Date: 11/8/11