CALPINE

PASTORIA ENERGY FACILITY
39789 EDMONSTON PUMPING PLANT ROAD
P.O. BOX 866
LEBEC, CALIFORNIA 93243

September 14, 2004

T3261

Ms. Nancy Tronaas
Compliance Project Manager
Pastoria Energy Facility, LLC
Docket No. 99-AFC-7C
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814-5512
Phone (916) 654-3864

**VIA: FEDERAL EXPRESS**

**RE: CALPINE CORPORATION PASTORIA ENERGY FACILITY, LLC (99-AFC-7C) PETITION FOR POST CERTIFICATION AMENDMENT FOR PROJECT COMMISSIONING ACTIVITIES**

Dear Ms. Tronaas:

Pursuant to Title 20, CCR Chapter, Section 1769 (a) (1), Pastoria Energy Facility, LLC ("PEF") is filing the attached petition for proposed modifications to the California Energy Commission ("CEC") Decision for the Pastoria Energy Facility Project, Docket 99-AFC-7C. This petition includes two Variance applications submitted to the San Joaquin Valley Unified Air Pollution Control District ("District") for PEF commissioning activities (one Variance application for each Power Block). These Variances are noticed for public hearing on October 13, 2004 with the District Hearing Board at 10:00 am in the Southern Regional District Office.

These Variance petitions, which seek relief from commissioning activities for PEF, are very similar to variances previously granted by the District Hearing Board for the Elk Hills and Sunrise Power Projects, which also commissioned Frame 7FA combustion turbine generators similar to those being commissioned by PEF. Recent discussions with District Staff indicate that they are currently in support of the PEF Variance applications. Therefore, PEF expects these Variances to be granted by the District Hearing Board on October 13, 2004.

Note that Conditions 4, 12, 14, 15, 16, 17, 19, 24, 29, 30, 31 and 38 of Authorities to Construct #S-3636-1-2, #S-3636-2-2 and #S-3636-1-2 from which variance relief is sought, equate to Commission Adoption Order, Docket No. 99-AFC-7C, Conditions of Certification AQ-4, AQ-12, AQ-14, AQ-15, AQ-16, AQ-17, AQ-19, AQ-24, AQ-28, AQ-29, AQ-30 and AQ-37. In this petition PEF proposes the addition of three new Conditions of Certification (AQ-87, AQ-88 and AQ-89), as was done with the previously mentioned Power Projects, which would grant relief from these Conditions of Certification and require PEF to comply with the anticipated Variance Order Granted by the District Hearing Board on October 13, 2004.

As demonstrated in this petition, the addition of new Conditions of Certification AQ-87 through AQ-89 would have no adverse effects on the environment. As such, PEF requests expedited review by CEC Staff and adoption of the amendment by the CEC in accordance with Title 20 CCR, Section 1769 (a). Thank you in advance for your help and effort to expedite this process.

Please note that I have also included two (2) CDs that contain modeling input and output files and meteorological and ozone data files that were utilized for the air quality impact assessment in this petition. In addition to the six (6) hard copies, is another CD which contains the electronic version of this entire petition submittal to CEC.

If you have any questions regarding this submittal, or need additional information, please do not hesitate to contact me at (661) 864-3842 or Gary Fuller at (661) 864-3846.

Respectfully Submitted,

Harry Scarborough
Plant Manager
Pastoria Energy Facility, LLC

GMF:jm

Attachments

Ms. Barbara McBride, Calpine Corporation (w/attachments)
Mr. Andrew Siegelstein, Calpine Corporation (w/attachments)
Mr. Noel Gonzales, Calpine Corporation (w/attachments)

# PETITION FOR POST CERTIFICATION AMENDMENT
# CALPINE CORPORATION
# PASTORIA ENERGY FACILITY, LLC
# MODIFY COMMISSION DECISION, DOCKET 99-AFC-7C
# CONDITIONS OF CERTIFICATION
# TO ALLOW FOR COMMISSIONING ACTIVITIES

**Pursuant to the California Code of Regulations Section 1769 (a)(1)(A), a description of the proposed amendment to Pastoria Energy Facility, LLC's Conditions of Certification is required.**

With this petition, Pastoria Energy Facility, LLC ("PEF") is requesting a post-certification amendment to add new conditions of certification to allow commissioning activities to take place upon completion of construction of Power Block I and Power Block II. Once construction is complete, each natural gas-fired combustion turbine generator ("CTG"), heat recovery steam generator ("HRSG") and electrical generation equipment associated with each Power Block will need to go through initial commissioning. During commissioning, certain emissions will be in excess of the permitted levels for short periods of time. Initial commissioning is a necessary practice for power plants. However, the San Joaquin Valley Unified Air Pollution Control District ("District") permit conditions and subsequent California Energy Commission ("CEC") Conditions of Certification do not clearly provide PEF with language governing initial commissioning. Therefore, PEF has submitted Variance petitions to the District, and is submitting this amendment petition to the CEC to allow for commissioning activities for Power Blocks I & II.

Two Petitions for Regular Variance (one for Power Block I and another for Power Block II) were submitted to the District on August 31, 2004. Copies of these petitions are provided in Attachment A. These variances have been noticed for public hearing before the District's Southern Region Hearing Board on October 13, 2004. A copy of this public notice is provided in Attachment B. This amendment petition proposes to add new CEC Conditions of Certification, AQ-87 through AQ-89, to incorporate the conditions imposed by the Variance Orders anticipated to be issued by the District Hearing Board on October 13, 2004. A complete description of the proposed new conditions is provided in Attachment C.

This petition to amend the Commission Decision approving the project contains all the information that is required pursuant to 20 CCR Section 1769, Post Certification Amendments and Changes, of the California Energy Commission's Siting Regulations.

**Pursuant to Section 1769 (a)(1)(B), a discussion of the necessity for the proposed modifications is required.**

PEF is currently in the process of constructing a power production facility to generate and sell electrical power into California's electrical market. The current facility design includes two (2) Power Blocks (Power Block I and Power Block II), combined-cycle electrical power generating units. Power Block I consists of two (2), nominally rated, 168 MW General Electric 7FA CTG units, that exhaust into separate HRSG's of which each is capable of powering (separately or combined) a 185 MW steam turbine generator ("STG"). Power Block II consists of one (1) 168 MW General Electric 7FA CTG unit exhausting into a HRSG which drives a separate 90 MW STG. Upon completion of construction and commissioning activities of both Power Blocks, PEF will supply approximately 779 MW to the California electrical grid.

The current schedule for PEF is for Power Block II to complete construction between the 4$^{th}$ Qtr. of 2004 and the 1$^{st}$ Qtr. of 2005. Construction of Power Block I is scheduled for completion between the 2$^{nd}$ and 3$^{rd}$ Qtr. of 2005. Upon completion of each Power Block they will each go into a commissioning phase consisting of cleanup, steam blows, tuning and testing prior to being available to supply electricity to the California electrical grid.

Commissioning each Power Block is essential to meeting performance guarantees and permit requirements, which are required for contractual agreements. Upon completion of each Power Block, PEF must commission them by performing a series of reduced load firings and system-tuning operations under various operating conditions. These testing activities are normal and necessary procedures to identify and resolve any problems with the construction of the equipment. Commissioning also includes clearing debris from the HRSG's and ducting before emission control catalysts are installed, cleaning the mill scale from the steam lines, tuning the CTG combustors, tuning control systems, and providing for controlled initial operation of the STG.

There will be two phases of commissioning for each Power Block during which emissions of NOx and CO and ammonia slip from each CTG/HRSG stack will at times exceed some limits specified in certain District permit conditions and CEC conditions of certification. District permit and CEC conditions of certification limits for opacity, along with opacity limits set by regulations, will also be exceeded at initial firing of the CTGs. The emission control catalysts will be installed after the end of the first phase of testing. This will prevent the catalyst bed from being damaged and fouled by debris not cleaned out of the HRSG after construction. By the end of commissioning, each Power Block is expected to be in full compliance with all existing conditions of certification.

Along with the District Variances, a petition to the CEC is sought to amend the Commission Decision (Docket 99-AFC-7C) to allow temporary relief of certain conditions of certification for NOx, CO, and ammonia slip emissions to allow for commissioning of these Power Blocks. This petition is similar to petitions filed and granted by the Commission for the La Paloma Project (98-AFC-2), Elk Hills Power Project (99-AFC-1) and Sunrise Power Project (99-AFC-4).

**Pursuant to Section 1769 (a)(1)(C) and (D), a discussion of whether the modification is based on information that was known by the petitioner during the certification proceeding, why it was not raised at that time and whether the proposed modification is based upon new information that changes or undermines the assumptions, rationale, findings, other bases of the Final Decision and explanation why it should be permitted is required.**

Prior to, and at the time the licensing of PEF was approved by the CEC and the District, conditions of certification and permit conditions did not account for the necessary commissioning activities required for Power Plants. Initially, PEF submitted a permit application to the District and a petition to amend Commission Decision (Docket 99-AFC-7C) on March 19, 2004, requesting that an allowance for commissioning activities be added to its permit conditions and conditions of certification. Although early power projects in the District had sought variance relief for commissioning activities, PEF believed that a modification of its Authorities to Construct and Conditions of Certification would be more consistent with recent District and CEC practices. However, after preparing and filing the permit application, and performing additional requested dispersion modeling analyses, PEF was informed by the District that it either had to modify the project to meet current BACT requirements or seek a variance to address the commissioning issue. PEF has also hired a consultant, Sierra Research, to assist in seeking variance relief, preparing this petition amendment for commissioning activities, and to provide expertise and advice towards achieving compliance.

Commissioning activities are necessary, and there is no alternative to conducting commissioning activities. If the variance is not granted, or this proposed petition amendment for commissioning is not approved, Petitioner would have no alternative other than to abandon this project before completion of construction, which would amount to the closing or taking of the Petitioner's business. Millions of dollars in sunk costs for site acquisition, engineering, design, permitting, site preparation, and construction would be lost, and several dozens of prospective jobs at the facility would be lost. Petitioner could also become subject to claims amounting to millions of dollars for breach of contracts entered into as part of the project. The likelihood

of future interruptions in power supply, especially in the Southern California area, would be increased.

**Pursuant to Section 1769 (a)(1)(E), an analysis of the impacts to the modifications may have on the environment and proposed measures to mitigate any significant adverse impacts is required.**

The estimated maximum daily excess NOx and CO emissions proposed for commissioning Power Block I & II were derived from a similar facility in Kern County (Sunrise Power Project), which is also equipped with 168 MW General Electric 7FA natural gas-fired turbine generating units. Attachment D includes a summary of the actual daily emissions emitted from the facility from each of the Sunrise CTG's during their commissioning phases. The estimated excess daily emission rates expected from the PEF commissioning activities for Power Block I & II were conservatively based upon the highest daily CTG emission rate experienced by the Sunrise facility during its commission phase. Actual excess daily emissions are not expected to reach maximum levels everyday during the commissioning periods of Power Block I & II. However, due to the complexity of commissioning and unforeseen conditions that may been encountered, PEF is unable to predict which days may reach these maximum levels and is seeking relief from daily and hourly limits throughout the commissioning period.

The PEF and Sunrise 168 MW General Electric 7FA natural gas-fired turbine generating units are very similar; however, they are not the same exact Model and Serial number. Other equipment, such as the control equipment, HRSG, steam generator, auxiliary and support equipment are also not the same. Additionally, commissioning activities are unique to each piece of equipment. Therefore, PEF has increased the estimated excess daily emission rates from the actual emission rates measured at the Sunrise facility by approximately 20% to account for any potential differences in emission rates. Estimated excess daily emissions are calculated as follows:

- 10,314.11 lbs/day CO (from Sunrise data) x 1.20 ≈ 12,500 lbs/day CO
- 3723.13 lbs/day NOx (from Sunrise data) x 1.20 ≈ 4,500 lbs/day NOx

The proposed maximum hourly emission rates for NOx (308 lbs/hour) and CO (2,527 lbs/hour), during commissioning of each CTG, were also derived from a similar facility during commissioning activities. Proposed maximum hourly emission rates are based on commissioning one turbine, at these rates, while all other turbines are at or below current permit limits. Therefore, PEF proposes that during the commissioning periods

of both Power Block I and Power Block II, emission rates from each CTG shall not exceed 308 lbs/hour of NOx and 2,527 lbs/hour of CO, and the combined emission rates from all three (3) CTG's shall not exceed 342 lbs/hour or 4,500 lbs/day of NOx and 2,576 lbs/hour or 12,500 lbs/day of CO. This is consistent with the proposed Condition of Certification AQ-89 in Attachment C.

PEF has assessed the facility's ambient air quality impacts during commissioning periods and confirmed that excess emissions from commissioning activities will not cause or contribute to a modeled violation of ambient air quality standards. Conservative air quality impact assessment techniques were used to estimate maximum impacts from worst-case facility-wide emissions. The results of the modeling are provided in Attachment E. Also, Modeling input and output files and meteorological and ozone data files are provided on the attached CD-ROM. The resulting maximum project NOx ambient impact (259 $\mu g/m^3$), when added to the maximum background NOx level measured in the Arvin area (165 $\mu g/m^3$) is below the state 1-hour NOx standard of 470 $\mu g/m^3$. Maximum CO impacts during commissioning will also be less than the State/Federal standards.

Consistent with District New Source review policy, no mitigation is necessary for CO because the region is in attainment for CO and ambient impacts during commissioning will not be significant.

PEF understands that the District requires mitigation when cumulative excess emissions during a variance period exceed 1 ton per pollutant from an emissions unit. PEF also understands that 20% of excess emissions, above 1 ton, has been a typical level of mitigation required for past variance proceedings in the District. Since this commissioning period is a one-time event, PEF believes that the 20% level of offsets is a reasonable mitigation.

The project will exceed the daily NOx emission rates for each unit during the commissioning period of Power Block I & II. PEF proposes to mitigate these excess emissions by surrendering NOx ERC's to the District after commissioning of each Power Block is complete and actual excess NOx emission have been determined for each unit. ERC's equal to 20% of the excess emissions over one ton will be provided upon District concurrence of this amount. The excess emissions will be determined within 30 days after completion of the commissioning period and submitted to the District for review.

Expected maximum opacity during this period for the CTG's, CTGs' lube oil vents and CTGs' generator lube oil vents is 80%. In addition, no daily emission limit (in lbs/day) is set for ammonia slip and, therefore, is not included.

Based upon this information, the proposed modification to conditions related to commissioning activities does not result in any significant adverse environmental impacts.

**Pursuant to Section 1769 (a)(1)(F), a discussion of the impact on the facility's ability to comply with applicable laws, ordinances, regulations, and standards (LORS) is required.**

The proposed modifications to the CEC Conditions in the Air Quality category do not result in significant new environmental impacts or changes to design elements subject to location requirements. Therefore, the proposed modifications are not anticipated to impact the facility's ability to comply with the applicable LORS.

**Pursuant to Section 1769 (a)(1)(G), a discussion of how the modification affects the public is required.**

The proposed modifications to the CEC Conditions in the Air Quality category are not anticipated to affect equipment on the project site or to have impacts on the surrounding community. Therefore, the proposed modifications are not anticipated to adversely affect the public.

**Pursuant to Section 1769 (a)(1)(H), a list of property owners potentially affected by the modification is required.**

PEF further asserts the proposed modifications contained in this Post-Certification Amendment Petition will not cause any additional impact, will not adversely affect the public; therefore, no property owners will be affected by the modification proposed.

**Pursuant to Section 1769 (a)(1)(H), a discussion of the potential effect on nearby property owners, the public, and the parties in the applicable proceedings is required.**

It is PEF's belief the proposed amendment will not result in any changes that would affect nearby property owners, the public, or any parties in the application proceedings.

Consistent with the requirements of Section 1769 (a)(1)(A), PEF is requesting approval of this Post-Certification Amendment Petition and to the Conditions of Certification proposed in Attachment C.

**Attachment A**

**Copy of District Variance Applications**
**(Dockets #S-04-48R and #S-04-49R)**

CALPINE

PASTORIA ENERGY FACILITY
39789 EDMONSTON PUMPING PLANT ROAD
P.O. BOX 866
LEBEC, CALIFORNIA 93243

August 31, 2004

T3197

Mr. Creighton Smith
Supervisor of Compliance, Southern Region
San Joaquin Valley Unified APCD
Southern Region Office
2700 'M' Street, Suite 275
Bakersfield, CA 93301

VIA: FEDERAL EXPRESS

**RE: APPLICATIONS FOR TWO (2) REGULAR VARIANCES FOR COMMISSIONING OF PASTORIA ENERGY FACILITY, LLC**

Dear Mr. Smith:

Enclosed are two (2) applications for Regular Variances and a check for $1,500.00 to cover the filing fees. Pastoria Energy Facility, LLC ("Pastoria") is currently in the process of constructing a power production facility to generate and sell electrical power into California's electrical market. The current facility design includes two (2) Power Blocks (Power Block I and Power Block II), combined-cycle electrical power generating units. A Regular Variance petition has been prepared and is being submitted to the San Joaquin Valley Air Pollution Control District ("District") for each Power Block.

Power Block I consists of two (2), nominally rated, 168 MW General Electric 7FA natural gas-fired turbine generating ("CTG") units, that exhaust into separate heat recovery steam generators ("HRSGs") of which each is capable of powering (separately or combined) a 185 MW steam turbine generator ("STG"). Power Block II consists of one (1) 168 MW General Electric 7FA natural gas-fired CTG unit exhausting into a HRSG which drives a separate 90 MW STG. Upon completion of construction and commissioning activities of both Power Blocks, Pastoria will supply approximately 779 MW to the California electrical grid.

The current schedule for Pastoria is for Power Block II to complete construction between the 4$^{th}$ Qtr. of 2004 and the 1$^{st}$ Qtr. of 2005. Construction of Power Block I is scheduled for completion between the 2$^{nd}$ and 3$^{rd}$ Qtr. of 2005. Upon completion of each Power Block they will each go into a commissioning phase consisting of cleanup, steam blows, tuning and testing prior to being available to supply electricity to the California Electrical Grid.

Commissioning each Power Block is essential to meeting performance guarantees and permit requirements, which are required for contractual agreements. Upon completion of each Power Block, Pastoria must commission them by performing a series of reduced load firings and system-tuning operations under various operating conditions. These testing activities are normal and necessary procedures to identify and resolve any problems with the construction of the equipment. Commissioning also includes clearing debris from the HRSGs and ducting before emission control catalysts are installed, cleaning the mill scale from the steam lines, tuning the CTG combustors, tuning control systems, and providing for controlled initial operation of the STG.

There will be two (2) phases of commissioning for each Power Block during which emissions of NOx and CO and ammonia slip from each CTG/HRSG stack will at times exceed some limits specified in the ATC permit conditions. Permit condition limits, along with limits set by regulations, for opacity will also be exceeded at initial firing of the CTGs. A variance is sought for NOx and CO emissions, ammonia slip, and selected permit conditions and District Rules. The emission control catalysts will be installed after the end of the first phase of testing. This will prevent the catalyst bed from being damaged and fouled by debris not cleaned out of the HRSG after construction. By the end of commissioning, each Power Block is expected to be in full compliance with all permit conditions and District Rules and Regulations.

Pastoria requests the District support and the District Hearing Board approve a 120-day (accumulative) variance period that can occur within an 11-month "time window" for Power Block I, and a 90-day (accumulative) variance period that can occur within the same 11-month time window for Power Block II. The 11-month time window is expected to begin on December 1, 2004 and end on October 31, 2005. The 11-month time window is intended to reflect uncertainties in the construction schedule for this complex project of two (2) Power Blocks and problems that may arise during the commissioning period. Construction of Pastroia is proceeding vigorously on an ambitious schedule but is subject to delays and schedule uncertainties, as is the case with any similarly complex project.

Pastoria's goal is to begin commissioning of Power Block II at the beginning of the 11-month window and be in compliance within 90 days thereafter, followed by commissioning of Power Block I and in compliance 120 days thereafter. However, delays in the start of commissioning and completion of testing/tuning may occur for each Power Block within the 11-month window.

If you have any questions, or need additional information, please do not hesitate to contact me at (661) 864-3842 or Gary Fuller at (661) 864-3846.

Respectfully Submitted,

Harry Scarborough
Plant Manager
Pastoria Energy Facility, LLC

GMF:jm

Attachments

Mr. Richard Kard, SJVUAPCD, Fresno (w/attachments)
Mr. Michael Carrera, SJVUAPCD, Fresno (w/attachments)
Ms. Nancy Tronaas, CEC, Docket 99-AFC-7C (w/attachments)
Ms. Barbara McBride, Calpine Corporation(w/attachments)
Mr. Andrew Siegelstein, Calpine Corporation(w/attachments)
Mr. Noel Gonzales, Calpine Corporation (w/attachments)
Mr. Wayne Luton, Calpine Corporation (w/attachments)
Mr. Gary Rubenstein, Sierra Research (w/attachments)

# PETITION FOR A HEARING
# BEFORE THE HEARING BOARD OF THE
# SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

[ ] Northern Region Office
4230 Kiernan Ave., Ste.130
Modesto, CA 95356
(209) 557-6400

[ ] Central Region Office
1990 E. Gettysburg Ave.
Fresno, CA 93726
(559) 230-5950

[ X ] Southern Region Office
2700 "M" St., Ste. 275
Bakersfield, CA 93301
(661) 326-6900

| TYPE OF HEARING | | FEES (Non-Refundable) | |
|---|---|---|---|
| ( X ) A. | Regular Variance | ( X ) A. | $ 750.00 |
| ( ) B. | Interim & Regular Variance | ( ) B. | $1050.00 |
| ( ) C. | Short Variance (90 Days or Less) | ( ) C. | $ 650.00 |
| ( ) D. | Interim & Short Variance | ( ) D. | $ 950.00 |
| ( ) E. | Emergency Variance | ( ) E. | $ 225.00 |
| ( ) F. | Appeal Hearing | ( ) F. | $ 750.00 |
| ( ) G. | Extension of Variance | ( ) G. | $ 300.00 |
| ( ) H. | Modification of Variance | ( ) H. | $ 300.00 |
| ( ) I. | Modification of Variance Schedule of Progress | ( ) I. | $ 300.00 |
| ( ) J. | Product Variance | ( ) J. | $1000.00 |
| ( ) K. | Rehearing | ( ) K. | $ 750.00 |
| ( ) L. | Revocation of Variance | ( ) L. | $ 300.00 |
| ( ) M. | Special Hearing | ( ) M. | $ 750.00 |
| | | **Total:** | |

## PETITION INFORMATION

**A.** **NAME OF FACILITY:** Pastoria Energy Facility, LLC

**FACILITY LOCATION:** 39789 Edmonston Pumping Plant Road

**CITY:** Lebec **STATE:** California **ZIP CODE:** 93243

**TELEPHONE:** (661) 864-3842 **FAX:** (661) 864-3862

**NAME OF PERSON AUTHORIZED TO RECEIVE NOTICES:** Harry Scarborough

**MAILING ADDRESS:** P.O. Box 866

**CITY:** Lebec **STATE:** California **ZIP CODE:** 93243-9998

**TELEPHONE:** (661) 864-3842 **FAX:** (661) 864-3862

**B.** **TYPE OF ENTITY (Check One)**

( ) Individual
( ) Co-Partnership
( X ) Corporation
( ) Other Entity

Please include the name, title, and address of officers, if a corporation; partners, if a co-partnership; or the person(s) in control if other entity. (Attach additional sheets, if needed)

**NAME** **TITLE** **ADDRESS**

Bryan Bertacchi, VP, Regional Power Executive, 4160 Dublin Blvd., Dublin, CA 94568-3139

| **DISTRICT USE ONLY** | | |
|---|---|---|
| **CHECK NUMBER:** | **RECEIPT NUMBER:** | **DATE RECEIVED:** |

1. **Briefly describe the type of business conducted at your facility.**

Pastoria Energy Facility, LLC is currently in the process of constructing a power production facility to generate and sell electrical power into California's electrical market.

2. **Describe in detail the equipment or activity that is the subject of this petition, what the equipment is used for, and why it is necessary to the operation of your business. Please include all pertinent information necessary to describe the activity including: fuels burned, raw materials processed, product produced, true vapor pressure(s) of all volatile organic compounds, site diagrams, material flow charts, fuel systems, and diagrams of air pollution control systems if necessary. Include copies of all District Permits to Operate and/or Authorities to Construct for each piece of equipment or activity relevant to this variance request.**

Pastoria Energy Facility, LLC (PEF) is located approximately 30 miles south of Bakersfield and 6 miles east of the Grapevine exit off of Intestate Highway 5. The current facility design includes two Power Blocks (Power Block I and Power Block II), combined-cycle electrical power generating units. Power Block I consists of two, nominally rated, 168 MW General Electric 7FA natural gas-fired turbine generating units, equipped with dry low-NOx combustors, that each exhaust into a separate heat recovery steam generator (HRSG) equipped with selective catalytic reduction (SCR), which drive a 185 MW steam generating turbine. Power Block II consists of one 168 MW General Electric 7FA natural gas-fired turbine generating unit, also equipped with dry low-NOx combustion, exhausting into a HRSG equipped with SCR, which drives a separate 90 MW steam turbine. A Power Plant System Schematic for PEF (Power Blocks I & II) is provided in Appendix 1. Upon completion of construction and commissioning activities of both Power Blocks, PEF will supply approximately 779 MW to the California electrical grid.

The current plan for PEF is that Power Block II is scheduled to complete construction the 4$^{th}$ Qtr., 2004/1$^{st}$ Qtr., 2005, and construction of Power Block is scheduled for completion the 2$^{nd}$ Qtr./3$^{rd}$ Qtr. of 2005. Upon completion of construction, each Power Block will go into a commissioning phase consisting of cleanup, steam blows, tuning and testing prior to being available to supply electricity to the California Electrical Grid.

Commissioning the units is essential to meeting performance guarantees and permit requirements (required for contractual agreements). However, guaranteeing compliance with all applicable permit and regulatory requirements during commissioning activities is not possible, as discussed in detail further in the variance petition. Consequently, PEF has prepared and submitted two (2) variance petitions to be heard by the San Joaquin Valley Air Pollution Control District Hearing Board (Hearing Board), one for Power Block I and the other for Power Block II. This variance petition is for Power Block I, which will be the second phase of construction to be completed, commissioned and put into commercial operation, after the completion of Power Block II.

Upon Completion of construction of Power Block I, PEF's Commissioning Group must commission this equipment by performing a series of reduced load firing and system-tuning operations under various operating conditions. These testing activities are normal and necessary procedures to identify and resolve any problems with the construction of Power Block I. These procedures include clearing debris from the two HRSGs and ducting before emission control catalysts are installed, cleaning the mill scale from the steam line, tuning both combustion turbine generators (CTGs) combustors, tuning control systems, providing for controlled initial operation of the steam generator and synchronizing to the electrical grid.

During the commissioning of Power Block I, emissions from the CTGs/HRSGs stack will exceed some limits specified in the conditions of Authorities to Construct, ATC #S-3636-1-2 and ATC #S-3636-1-2 (Appendix 2). Emissions of NOx, CO and ammonia slip will exceed permit limits, and regulatory limits set for opacity will also be exceeded at various times during the commissioning period. Emissions of $PM_{10}$, VOCs and SOx, however, are expected to meet permit limits during the entire commissioning period. Therefore, a variance is sought from NOx, CO, and ammonia slip emissions limits, and from selected permit conditions and District rules. Power Block I is expected to be in full compliance with all permit conditions within 120 days of commissioning activities.

PEF requests that the Hearing Board of the San Joaquin Valley Air Pollution Control District (District Hearing Board), approve a 120-day variance period that can occur within an 11-month "time window" for commissioning Power Block I. PEF proposes the 120-day variance period to begin upon telephone notification to the District. The 11-month time

window is expected to begin December 1, 2004 and end on October 31, 2005. All schedules presented in this petition are estimates based on experience with similar installations, but subject to uncertainty. The 11-month window is intended to reflect uncertainties in the construction schedule that exist for this complex project and problems that may arise during the commissioning period. Construction of Power Block I and Power Block II is proceeding vigorously on an ambitious schedule but is subject to delays and uncertainties. PEF's goal is to begin commissioning Power Block I near the middle of the 11-month window and be in full compliance within 120 days thereafter. However, delays in the start of commissioning and completion of testing/tuning may occur within the 11-month window.

If significant equipment or testing problems are encountered, the 120-day commissioning period might be divided into two or more periods that could span more than 120 consecutive calendar days, but elevated emissions during testing/tuning efforts would not exceed 120 days cumulatively. Commissioning may also be accomplished in less than 120 days if no problems are encountered during testing. In recognition of the uncertainty of encountering lengthy delays during commissioning of Power Block I, PEF requests that the District Hearing Board consider allowing the 120-day variance period for Power Block I to be segmented. That is, the duration of the variance relief might exceed 120 consecutive calendar days, but commissioning activities at Power Block I would not exceed 120-cumulative days.

PEF proposes to notify the District upon the start of commissioning (i.e., first fire of either CTG) to commence the 120-day variance period and will notify the District of any problems during commissioning that would extend the duration beyond 120 consecutive calendar days.

The commissioning period for Power Block II will consist of two phases: Phase 1 being a cleanup period when both the CTGs and HRSGs will be operated without the SCR being installed, and Phase 2 being a startup, tuning and synchronization period when the catalysts will be installed.

Phase 1 – Facility Cleanup: This phase will begin immediately after the first fire of the CTGs. The SCR will not be in place to prevent contamination, damage and fouling of the catalyst beds from the first, initial firing of the CTGs and by residues and debris left in the HRSG as a

result of the construction process. Also, during the first several hours (not expected to exceed 24 hours) of first firing the CTGs, the opacity of the exhaust stack and lube oil vents are expected to exceed 20% opacity due to burning off preservative coatings on the new equipment.

The CTGs will be slowly brought up to approximately 20 to 40% load and held at that point, generating steam in the HRSGs. The steam will be sent through the steam piping of Power Block I and discharged to atmosphere. The CTGs will be started and stopped several times during this process in order to move the temporary piping used to clean various systems. These steam blows will be conducted 24 hours per day and are scheduled for ten to fifteen days, but could extend longer if required to completely clean the CTGs, HRSGs and other related systems.

Phase 2 – Startup and tuning: After completion of the steam blows, the final piping connections will be made and both the SCR catalysts will be installed. The SCR ammonia system will be functional on both CTGs/HRSGs. Thus, emissions will be reduced by the emission control systems during this stage of the commissioning.

The initial work conducted in this phase will consist of CTGs and ammonia systems tuning, all of which are scheduled to last for 10 to 15 days. The CTGs will be slowly brought to full load and subsequently varied to lower loads for tuning purposes. These varied loads will include loads below 60% (the load at which the combustors achieves dry low NOx operation) where the permit emission limits will not be met. During this period, there will be several startups and shutdowns with most startups extending beyond permitted time limits. Also, during the early stage of this phase, the SCR ammonia system will be tuned, and the ammonia slip permit limits may not be met.

Following the tuning process of the CTGs, the initial synchronizing and loading process of the steam turbine generator will begin and is scheduled to last for 10 to 15 days. The SCR would be operational as designed. The CTGs would be slowly brought up in load as required to slowly heat the steam turbine generator (STG), then the STG will be brought up in speed. Once the STG's synchronous speed is achieved, operation in this mode would occur for several hours. Then the STG would be synchronized to the electric grid and again maintained for a period of time. The STG would then be slowly loaded at various hold points until the CTGs' full load is

achieved. The CTGs would then be backed down to lower loads and then raised back up to full load, with STG also being introduced to various loads. This process would be repeated several times and could include several attempts involving unit trips, controlled shutdowns and slow startups (mostly hot and warm startups of the STG). Permit limited startup times will be exceeded and emissions limits will be exceeded at various times during this phase of commissioning.

Following STG loading, Power Block I's optimization, performance testing, and reliability run will occur and is expected to take approximately 30 days. The SCR catalyst would be operational as designed. This will involve mostly operation within the permit limits. Several starts and stops will be made. This will include some starts not meeting the time and emission limits and potentially some low load operation, which will not meet permit emission limits.

The estimated excess emission rates for NOx and CO are provided in item 12 of this Variance application. These estimated emission rates were derived from a similar facility in Kern County, equipped with two similar 168 MW General Electric 7FA natural gas-fired turbine generating units. The Hearing Board granted this facility a Regular Variance to complete commission activities. A summary of the actual daily emissions emitted from each of the two CTGs during their commissioning phases is attached in Appendix 3. The estimated excess daily emission rates expected from the PEF commissioning activities for Power Block II, were conservatively based upon the highest daily emission rate experienced by this facility during their commission phase.

The PEF 168 MW General Electric 7FA natural gas-fired turbine generating units are very similar to the units producing the emission results in Appendix 3; however, they are not exactly the same Model and Serial #. Other equipment, such as the control equipment, HRSG, steam generator, auxiliary and support equipment are not the same. Additionally, commissioning activities are also unique to each piece of equipment. Therefore, PEF has increased the estimated excess daily emission rates from the actual emission rates encountered from the other facility by approximately 20%, to account for the potential detrimental differences they may have on emission rates.

The maximum NOx and CO hourly emission rates expected from commission activities from both Power Block II and Power Block I were also evaluated in this variance petition. An air dispersion modeling analysis was performed to determine whether emissions during the variance period from the commissioning of these Power Blocks would cause or contribute to an ambient air quality standard (AAQS) violation or Prevention of Significant Deterioration (PSD) increment exceedance. The modeling, provided in Appendix 4, demonstrates that the proposed variance will not cause a violation of applicable short-term AAQS's.

3. **List all Permit to Operate Condition numbers and District Rule numbers, including subsections, for which you are requesting variance relief and explain how you are violating or will violate the condition(s) and/or rule(s).**

The Petitioner is requesting relief from: Conditions 4, 12, 14, 15, 16, 17, 19, 24, 29, 30, 31 and 38 of Authorities to Construct #S-3636-1-2 & #S-3636-2-2 and from District Rules 1081, 2010.4.2, 2070.7.0, 2201, 4001, 4101 and 4703. The Petitioner will, at times, exceed hourly and/or daily stack emission limits during commissioning operations. Commissioning operations include necessary and unavoidable operations of the CTGs both prior to and after the installation of the SCR catalysts in order to clean the units of dust and debris and to test and tune the units before commercial operation commences. Also, during the first initial firing of each CTG, visual opacity from the CTGs', and lube oil vents are expected to be greater than 20% and 5% respectfully.

Based on the emission estimates provided in Item 12 of this variance petition, PEF is requesting relief from the following Authorities to Construct #S-3636-1-2 and #S-3636-2-2conditions:

Condition #4: "Combustion turbine and electrical generator lube oil vents shall be equipped with mist eliminators to maintain visible emissions from lube oil vents no greater than 5% opacity, except for three minutes in any hour. [District Rule 2201]"

Variance: During the initial first firing of the CTG the opacity from the CTG and CTG generator lube oil vents are expected to be greater than 5% opacity for the first few hours of operation, not to exceed 24 hours.

Although it unknown what the maximum opacity will be, it is expected not to exceed 80%.

Condition #12: "Startup is defined as the period beginning with turbine initial firing until the unit meets the lb/hr and ppmv emission limits in condition 17. Shutdown is defined the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Duration of startup and shutdown shall not exceed three hours and one hour, respectively, per occurrence. [District Rule 2201 and 4001]"

Variance: Startup up times will extend beyond these times during steam blows, initial CTG and STG tuning, synchronization, and equipment optimization.

Condition #14: "Ammonia shall be injected when the selective catalytic reduction system catalyst temperature exceeds 500 degrees F. Permittee shall monitor and record catalyst temperature during periods of startup. [District Rule 2201]"

Variance: The SCRs catalyst will not be installed during steam blows, and there may be times during the tuning of the ammonia system when the SCR is not functioning at its optimal design and is above 500 degrees F and ammonia is not being injected.

Condition #15: "During startup or shutdown CGT exhaust emissions shall not exceed any of the following: NOx (as NO2) - 130 lb., VOC – 273 lb. or CO -1235 lb., in any one hour. [District Rule 2201]"

Variance: CTG daily emissions during startup and shutdown will exceed values listed for NOx and CO during steam blows, initial CTG and STG tuning, synchronization, and equipment optimization.

Condition #16: "By two hours after turbine initial firing, GTE exhaust emissions shall not exceed any of the following: NOx (as NO2) - 12.2 ppmv @ 15% O2 and CO - 25 ppmv @ 15% O2. [District Rule 4703]"

Variance: CTGs emissions will exceed values listed during steam blows, initial CTGs and STG tuning, synchronization, and equipment optimization.

Condition #17: "Emission rates from the GTE, except during startup and/or shutdown, shall not exceed any of the following: NOx (as NO2) - 17.03 lb/hr and 2.5 ppmvd @ 15% O2, VOC - 2.0 ppmvd @ 15% O2, CO - 24.92 lb/hr and 6 ppmvd @ 15% O2, ammonia - 10 ppmvd @15%O2. NOx (as NO2) emission limit is a one-hour average. Ammonia emission limit is a twenty-four hour rolling average. All other emission limits are three-hour rolling averages. [District Rules 2201, 4001, and 4703]"

Variance: Emission rates, except SOx, VOC and $PM_{10}$, will exceed values listed during steam blows, initial CTGs and STG tuning, synchronization, and equipment optimization. Opacity will also exceed 20% (80% maximum expected) during this period.

Condition #19: "On any day when a startup or shutdown occurs, emission rates from GTE shall not exceed any of the following: PM10: 216 lb/day, SOx (as SO2): 84 lb/day, NOx (as NO2): 450 lb/day, VOC: 355 lb/day, and CO: 2,113 lb/day. [District Rule 2201]"

Variance: Emission rates for NOx and CO will exceed values listed during steam blows, initial CTGs and STG tuning, synchronization, and equipment optimization.

Condition #24: "Prior to operation, permittee shall surrender offsets for S-3636-1-2, '2-2, '3-2, '4-2 and '5-2, for all calendar quarters in the following amounts, at the offset ratio specified in Rule 2201 (6/15/95 version) Table 4.2, PM10 - Q1: 58,305 lb, Q2: 58,953 lb, Q3: 59,601 lb, and Q4: 58,602 lb; SOx (as SO2) - Q1: 20,905 lb, Q2: 21,137 lb, Q3: 21,369 lb, and Q4: 21,369 lb; NOx (as NO2) - Q1: 80,010 lb, Q2: 80,899 lb, Q3: 81,787 lb, and Q4: 81,788 lb; and VOC - Q1: 51,194 lb, Q2: 51,762 lb, Q3: 52,331 lb, and Q4: 52,332 lb. [District Rule 2201]"

Variance: The daily emissions limits will be exceeded during the commissioning period and additional Emission Reduction Credits (ERCs) equal to 20% of the excess emissions over one ton will be provided upon District concurrence of this amount. The excess emissions will be determined within 30 days after completion of the commissioning period and submitted to the District for review.

Condition #29: "Compliance with ammonia slip limit shall be demonstrated by using the following calculation procedure: ammonia slip ppmv @ 15% O2 = ((a-(bxc/1,000,000)) x 1,000,000 / b) x d, where a = ammonia injection rate(lb/hr)/17(lb/lb. mol), b = dry exhaust gas flow rate (lb/hr)/(29(lb/lb. mol), c = change in measured NOx concentration ppmv at 15% O2 across catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip. Alternatively, permittee may utilize a District approved continuous in-stack ammonia monitor to monitor compliance. At least 60 days prior to using a NH3 CEM, the permittee must submit a monitoring plan for District review and approval [District Rule 4102]"

Variance: PEF will calculate ammonia slip during commissioning activities; however, compliance with this condition cannot be met during the commissioning phase until steam blows, initial CTGs and STG tuning, and equipment optimization is complete.

Condition #30: "Compliance with the short term emission limits (lb/hr and ppmv @ 15% O2) shall be demonstrated within 90 days of initial operation of each gas turbine engine and annually thereafter by District witnessed in situ sampling of exhaust gasses by a qualified independent source test firm at full load conditions as follows - NOx: ppmvd @ 15% O2 and lb/hr, CO: ppmvd @ 15% O2 and lb/hr, VOC: ppmvd @ 15% O2 and lb/hr, PM10: lb/hr, and ammonia: ppmvd @ 15% O2. Sample collection to demonstrate compliance with ammonia emission limit shall be based on three consecutive test runs of thirty minutes each. [District Rule 1081]"

Variance: If unforeseen commissioning problems arise, compliance demonstration could be delayed until the end of the 11-month time frame, with the understanding that the startup and commissioning activities would not exceed the 120 cumulative days during the 11-month window.

Condition #31: "Compliance with the startup NOx, CO, and VOC mass emission limits shall be demonstrated for one of the GTEs (S-3636-1, '2 or '3) upon initial operation and at least every seven years thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. [District Rule 1081]"

Variance: If unforeseen commissioning problems arise, compliance demonstration could be delayed until the end of the 11-month time frame, with the understanding that the startup and commissioning activities would not exceed the 120 cumulative days during the 11-month window.

Condition #38: "The permittee shall maintain hourly records of NOx, CO, and ammonia emission concentrations (ppmv @ 15% O2), and hourly, daily, and twelve-month rolling average records of NOx and CO emissions. Compliance with the hourly, daily, and twelve-month rolling average VOC emission limits shall be demonstrated by the CO CEM data and the VOC/CO relationship determined by annual CO and VOC source tests. [District Rule 2201]"

Variance: During the ammonia system tuning, inaccuracies of ammonia injection rates and significant variations in ammonia slip could occur and accurate records may not be available.

As noted at the end of these conditions, PEF will require relief form several District Rules during the commissioning period. Specific Rules are as follows:

- Rule 1081 which establishes time period for compliance testing;
- Rule 2010.4.2 which requires operation according to permit conditions;
- Rule 2070.7.0 which requires operation according to permit conditions;
- Rule 2201 which requires emissions control equipment to be on-line at all times;
- Rule 4001 which incorporates the new source performance standards;
- Rule 4101 which establishes limits for visible emissions; and
- Rule 4703 which establishes emissions limits for NOx and CO.

4. **Is the equipment or activity subject to this request currently under a District variance? Yes: __ No: _X__ If yes, give the Docket Number, date of the last variance action, final compliance date, and a brief explanation.**

5. **Have you received a variance for any other equipment or activity at this location within the previous six months? Yes: _____No: ____X If yes, give the Docket Number(s), date(s), final compliance date, and a brief explanation.**

6. **Why is it beyond your reasonable control to comply with the rule(s) and/or permit condition(s)?**

The Petitioner cannot comply with permit conditions and District Rules during the Power Block I commissioning period because the emission control equipment will not be installed and operational at all times. Operation prior to installation of control equipment is necessary to clean out dust and debris from the HRSGs and CTGs exhaust path. This dust and debris would damage the SCR catalysts if it were in the exhaust path. Additionally, after installation of control equipment the CTGs and STG and control equipment will require tuning and testing at various operating loads to minimize emissions and achieve compliance with all permit conditions. Commissioning the units is essential to establish that the units meet performance guarantees and permit requirements (required for contractual agreements), but guaranteeing compliance during commissioning activities is not possible. There is no expedient or practical alternative means of complying with all permit conditions and District Rules during the commissioning period.

7. **What would be the harm to your business if the variance were not granted? Include business closure, economic losses in dollar amounts, breach of contracts, hardships on customers, employee lay-offs, and similar matters.**

Commissioning activities are necessary, and there is no alternative to conducting commissioning activities. If the variance is not granted, Petitioner would have no alternative other than to abandon this project before completion of construction, which would amount to the closing or taking of the Petitioner's business. Millions of dollars in sunk costs for site acquisition, engineering, design, permitting, site preparation and construction would be lost, and several dozens of prospective jobs at the facility would be lost. Petitioner could also become subject to claims amounting to millions of dollars for breach of contracts entered into as part of the project. The likelihood of future interruptions in power supply, especially in the southern California area, would be increased.

8. **When, and under what circumstances, did your company first become aware that it would not be in compliance?**

PEF became aware that it would not be in compliance with its permit limits, and that the District would be enforcing the permit limits during commissioning activities, shortly before submitting a permit application to include commissioning conditions, in March 2004.

**9. What actions have you taken since that time to achieve compliance?**

Initially, PEF attempted to resolve the issue through communications and negotiations with District staff. PEF submitted a permit application to the District on March 19, 2004, requesting that an allowance for commissioning activities be added to its permit conditions. Although early power projects in the District had sought variance relief for commissioning activities, PEF believed that a modification of its Authorities to Construct would be more consistent with recent District practices. However, after preparing and filing the permit application, and performing additional requested dispersion modeling analyses, PEF was informed by the District that it either had to modify the project to meet current BACT requirements or seek a variance to address the commissioning issue. PEF has also hired a consultant, Sierra Research, to assist in seeking variance relief and to provide expertise and advice towards achieving compliance.

**10. Explain what options have been evaluated towards curtailment or termination of operations in lieu of obtaining a variance.**

Curtailing operations will not result in compliance since commissioning requires operation under all operating modes and loads, and must be completed prior to commercial operation of the turbines. Termination of operation would result in significant monetary losses and the potential disruption of power supply.

**11. Will there be excess emissions (emissions in excess of those allowed by the rules or permit conditions), including hazardous or toxic emissions, during this variance period? Yes: _X___ No: ___ If no, explain why there will be no excess emissions and then continue to number 16.**

Excess emissions of NOx and CO and ammonia slip are expected to occur during commissioning of Power Block I, as described previously in Items 2 and 3.

No excess hazardous or toxic emissions are expected. Fuel usage during commissioning will not exceed the maximum fuel use provided in the original permit application materials. Therefore, hazardous and toxic emissions during commissioning are not expected to be greater than emissions demonstrated during normal operation.

**12. Estimate the daily excess emissions on a pounds per day basis or, if applicable, the percent opacity of visible emissions during the variance period.**

The tables below lists estimated maximum daily excess NOx and CO emissions for commissioning Power Block I (ATC #S-3636-1-2 and ATC #S-3636-2-1). These estimates are based on maximum daily emissions at a similar facility during its commissioning phases, and represent worst-case operating conditions that might occur as described previously. Actual excess daily emissions are not expected to be this high everyday during the commissioning period of Power Block I. However, due to the complexity of commissioning and unforeseen conditions that may been encountered, PEF is unable to predict which days may reach these levels and is seeking relief from these daily limits throughout the 120-day cumulative commissioning period.

Expected maximum opacity during this period for the CTGs, CTGs' lube oil vents and CTGs' generator lube oil vents is 80%. In addition, no daily emission limit (in lbs/day) is set for ammonia slip and, therefore, is not included.

**ATC #S-3636-1-2**

| Pollutant | Permit limit one turbine (lbs/day) | Total Estimated Emissions (lbs/day) | Reduction Due to Mitigation (lbs/day) | Net Excess Emissions After Mitigation (lbs/day) |
|---|---|---|---|---|
| NOx | 450 | 4,500 | 0 | 4,050 |
| CO | 2,113 | 12,500 | 0 | 10,387 |

**ATC #S-3636-2-2**

| Pollutant | Permit limit one turbine (lbs/day) | Total Estimated Emissions (lbs/day) | Reduction Due to Mitigation (lbs/day) | Net Excess Emissions After Mitigation (lbs/day) |
|---|---|---|---|---|
| NOx | 450 | 4,500 | 0 | 4,050 |
| CO | 2,113 | 12,500 | 0 | 10,387 |

**13. Please show all calculations and provide references for emission factors used in estimating excess emissions.**

As previously discussed, these estimated emission rates were derived from a similar facility in Kern County, equipped with similar 168 MW General Electric 7FA natural gas-fired turbine generating units. The Hearing Board also granted this facility a Regular Variance to complete commission activities. Attachment 1 includes a summary of the actual daily emissions emitted from the facility from each of their CTGs during their commissioning phases. The estimated excess daily emission rates expected from the PEF commissioning activities for Power Block I, were conservatively based upon the highest daily emission rate experienced by this facility during their commission phase.

These 168 MW General Electric 7FA natural gas-fired turbine generating units are very similar, however, they are not exact in Model and Serial #. Other equipment, such as the control equipment, HRSG, steam generator, auxiliary and support equipment are not the same. Additionally, commission activities are unique to each piece of equipment. Therefore, PEF has increased the estimated excess daily emission rates from the actual emission rates encountered from the other facility by approximately 20%, to account for the potential detrimental differences they may have on emission rates.

- 10,314.11 lbs/day CO x 1.20 ≈ 12,500 lbs/day CO
- 3723.13 lbs/day NOx x 1.20 ≈ 4,500 lbs/day NOx

The proposed maximum hourly emission rates of NOx (308 lbs/hr) and CO (2,527 lbs/hr), for commissioning the CTGs, were also derived from a similar facility during commissioning activities. These maximum hourly emission rates for Power Block I are based on commissioning one turbine during these hours of operation, while all other turbine are at or below current permit limits. The insignificant impact of these emission rates on air quality is discussed further in item 15 of this petition.

**14. If there are excessive hazardous or toxic emissions, attach a health risk assessment and receptor modeling data.**

No excess hazardous or toxic emissions are expected. Fuel usage during commissioning will not exceed the maximum fuel use provided in the original permit application materials. Therefore, hazardous and toxic emissions during commissioning are not expected to be greater than emissions demonstrated during normal operation.

**15. Explain how you can reduce or mitigate excess emissions from the subject equipment, other facility equipment (in order to offset excess emissions), or other activity to the maximum extent feasible during the variance period.**

PEF has assessed the facility's ambient air quality impacts during commissioning periods and confirmed that excess emissions from commissioning activities will not cause or contribute to a modeled violation of ambient air quality standards. Conservative air quality impact assessment techniques were used to estimate maximum impacts from worst-case facility-wide emissions. The results of the modeling are provided in Appendix 4. The resulting maximum project NOx ambient impact (259 $\mu g/m^3$), when added to the maximum background NOx level measured in the Arvin area (165 $\mu g/m^3$), is below the state 1-hour NOx standard of 470 $\mu g/m^3$. Maximum CO impacts during commissioning will be less than the State/federal

Consistent with District New Source review policy, no mitigation is necessary for CO because the region is attainment for CO and ambient impacts during commissioning will not be significant.

PEF understands that the District requires mitigation when cumulative excess emissions during a variance period exceed 1 ton per pollutant from an emissions unit. PEF also understands that 20% of excess emissions, above 1 ton, has been a typical level of mitigation required for past variance proceedings in the District. Since this commissioning period is a on-time event, PEF believes that the 20% level of offsets is a reasonable mitigation.

The project will exceed the daily NOx emission rates for each unit (ATC #S-3636-1-2 and ATC #S-3636-2-1) during the commissioning period of Power Block I. PEF proposes to mitigate these excess emissions by surrendering pre or post 1990 NOx ERCs to the District after

commissioning of Power Block I is complete and actual excess NOx emission have been determined for each unit. ERC's equal to 20% of the excess emissions over one ton will be provided upon District concurrence of this amount. The excess emissions will be determined within 30 days after completion of the commissioning period and submitted to the District for review.

16. **Can you monitor or quantify emission levels from the subject equipment or activity during the variance period and make such records available to the District? Yes: __X__ No: _____ Provide an explanation of your response.**

Petitioner will install and operate a continuous emissions monitoring (CEM) system to measure and record NOx, CO, and O2 emissions rates and concentrations, and will continuously measure and record fuel flow rate to the CTGs. In the event that the CEM system is unavailable during commissioning operations, PEF will make its best effort to utilize a qualified independent source test firm to measure and record NOx, CO, and O2 emissions rates and concentrations.

17. **How do you intend to achieve compliance with the rule(s) or permit condition(s)? Include a detailed description of any equipment to be installed and/or modifications to be made, a listing of the dates by which the actions will be completed, and an estimate of the total cost, if available.**

During commissioning, turbine and emission control equipment will be continuously cleaned, tested and adjusted to them into compliance as quickly as possible. PEF has a strong economic incentive to complete commissioning as quickly as possible in order to be able to sell power to the grid.

18. **Please state the dates you are requesting the variance to begin and end (the end date should be the date you expect to achieve compliance with the rules, regulations, and permit conditions).**

Begin variance: December 1, 2004
End variance: October 31, 2005

The estimated schedule for first fire of Power Block I is April 1, 2005. If commissioning activities are completed within 120-consecutive calendar days, Power Block I will begin normal operations on July 1, 2005. However, due to all the previously mentioned complexities involved with constructing a power generating facility of this magnitude and size, including Power Block II, PEF is requesting a Regular Variance from 12/1/04 until 10/31/05, with commissioning activities not to exceed a total of 120-cumulative operating days.

19. **If a regular variance is to extend over one year, you must attach a Schedule of Increments of Progress which must specify certain dates or milestones to be met in achieving compliance.**

Petitioner is not seeking variance relief for more than one year.

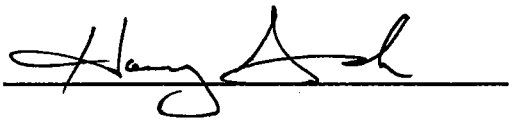
20. **Were you issued a Notice of Violation or Notice to Comply concerning the current operation of this equipment or activity? Yes: ____ No: __X__ If yes, please attach a copy of the notice.**

21. **Please list the names of any District personnel who are familiar with the facility or with whom facility representatives have had contact concerning this variance petition, or any related Notice of Violation or Notice to Comply.**

Permit Services: Seyed Sadredin, Tom Goff and Richard Karrs.
Compliance: Creighton Smith.

22. **Have you received any complaints from members of the public regarding the operation of the subject facility, equipment, or related activities within the last six (6) months? Yes: _____ No: __X__ If yes, indicate date(s), nature of complaint(s), and address(s) of complainant(s).**

**The undersigned, under penalty of perjury, states that the above petition, including attachments, and the items therein set forth are true and correct.**

**Date:** August 31, 2004 **Signature:** 

**Title:** Plant Manager

**Print Name:** Harry Scarborough

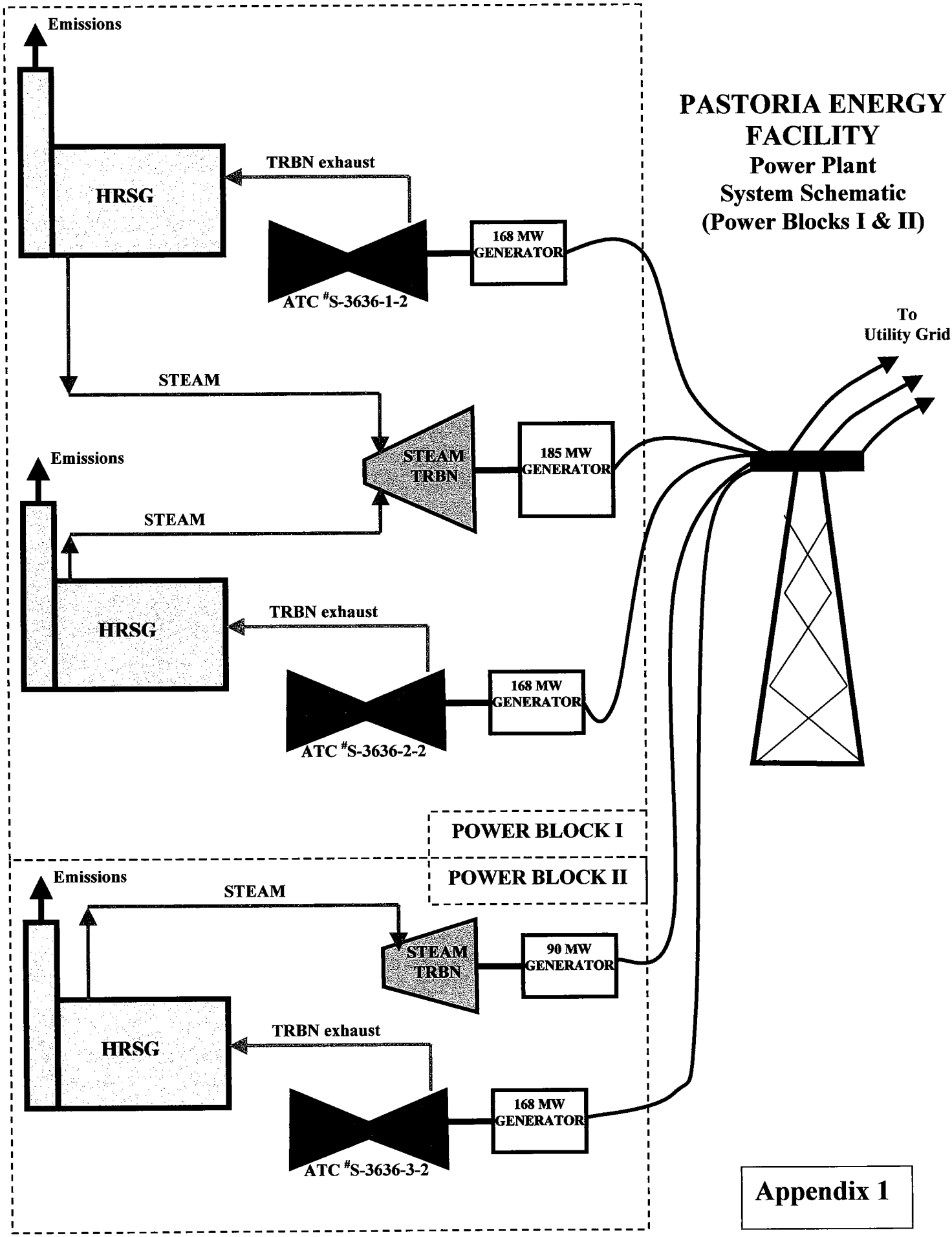
**The original petition in this format with 15 copies of any attachments must be submitted to the District. Petitions which are incomplete, illegible, submitted in the wrong format, or without the necessary filing fee will be returned. If you need assistance completing this Petition and/or developing a compliance schedule, contact the Compliance Division in your region.**

# APPENDIX 1

## PASTORIA ENERGY FACILITY
## Power Plant Schematic
## (Power Blocks I & II)

# PASTORIA ENERGY FACILITY

## Power Plant System Schematic (Power Blocks I & II)




**Appendix 1**

# APPENDIX 2

## COPY OF
## ATC #S-3636-1-2 and ATC #S-3636-2-2

San Joaquin Valley
Air Pollution Control District

# AUTHORITY TO CONSTRUCT

**PERMIT NO:** S-3636-2-2 **ISSUANCE DATE:** 06/26/2002

**LEGAL OWNER OR OPERATOR:** PASTORIA ENERGY FACILITY, LLC
**MAILING ADDRESS:** 101 CALIFORNIA STREET, STE 1950
SAN FRANCISCO, CA 94111

**LOCATION:** TEJON RANCH 30 MILES S OF BAKERSFIELD
AND 6.5 MILES E OF GRAPEVINE
RANCHO EL TEJON, CA

**EQUIPMENT DESCRIPTION:**
MODIFICATION OF PREVIOUSLY AUTHORIZED 168 MW NOMINALLY RATED GENERAL ELECTRIC 7FA NATURAL GAS FIRED GAS TURBINE ENGINE/ELECTRICAL GENERATOR #2 WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION OR XONON CATALYTIC COMBUSTOR TECHNOLOGY, HRSG #2, AND A SINGLE 185 MW STEAM TURBINE #1 SHARED WITH GAS TURBINE ENGINE S-3636-1: ELIMINATE OXIDATION CATALYST; ADD POWER AUGMENTATION STEAM INJECTION; REDUCE EXHAUST STACK HEIGHT; LOWER PM10 HOURLY AND PM10, NOX, AND VOC ANNUAL EMISSIONS AND OFFSET QUANTITIES; AND APPROVE SOX AS INTERPOLLUTANT OFFSETS FOR PM10

## CONDITIONS

1. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. Permittee shall submit design details of continuous emission monitoring system and XONON catalytic combustor system or selective catalytic reduction system to the District at least 90 days prior to onsite delivery. [District Rule 2201]
3. Permittee may replace XONON catalytic combustors with selective catalytic reduction system within two years after first operation without receiving a separate approval from the District subject to all the conditions and emissions limits set forth in this approval. [District Rule 2201]
4. Combustion turbine and electrical generator lube oil vents shall be equipped with mist eliminators to maintain visible emissions from lube oil vents no greater than 5% opacity, except for three minutes in any hour. [District Rule 2201]
5. Combustion turbine engine(GTE) shall be equipped with continuously recording fuel gas flowmeter. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

DAVID L. CROW, Executive Director / APCO

RECEIVED
JUL 09 2002
PEF

SEYED SADREDIN, Director of Permit Services
S-3636-2-2: Jun 26 2002 2:48PM – KARRSR : Joint Inspection NOT Required

6. GTE exhaust shall be equipped with continuously recording emissions monitors (CEM) for NOx, CO, and O2. If SCR NOx control system is used, CTG shall be equipped with an additional CEM for NOx ahead of the SCR unit or, alternatively, a continuously recording ammonia monitor. All CEMs shall be dedicated to this unit and shall meet the requirements of 40 CFR Part 60 Appendices B & F, and 40 CFR Part 75, and shall be capable of monitoring emissions during startups and shutdowns as well as normal operating conditions. If relative accuracy of CEM(s) cannot be certified during startup conditions, CEM results during startup and shutdown events shall be replaced with startup emission rates obtained during source testing to determine compliance with emission limits in conditions 15, 19 and 20. [District Rule 2201]
7. Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District Rule 2201]
8. Exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods. [District Rule 1081]
9. Heat recovery steam generator design shall provide space for additional selective catalytic reduction catalyst and oxidation catalyst if required to meet NOx and CO emission limits. [District Rule 2201]
10. Permittee shall monitor and record exhaust gas temperature at selective catalytic reduction and oxidation catalyst inlets. [District Rule 2201]
11. GTE shall be fired exclusively on natural gas, consisting primarily of methane and ethane, with a sulfur content no greater than 0.75 grains of sulfur compounds (as S) per 100 dry scf of natural gas. [District Rule 2201]
12. Startup is defined as the period beginning with turbine initial firing until the unit meets the lb/hr and ppmv emission limits in condition 17. Shutdown is defined the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Startup and shutdown durations shall not exceed three hours and one hour, respectively, per occurrence. [District Rule 2201 and 4001]
13. Only one of GTEs S3636-1, '2 or '3 shall be in startup at any one time. [District Rule 2201]
14. Ammonia shall be injected when the selective catalytic reduction system catalyst temperature exceeds 500 degrees F. Permittee shall monitor and record catalyst temperature during periods of startup. [District Rule 2201]
15. During startup or shutdown GTE exhaust emissions shall not exceed any of the following: NOx (as NO2) - 130 lb, VOC - 273 lb or CO - 1235 lb, in any one hour. [CEQA]
16. By two hours after turbine initial firing, GTE exhaust emissions shall not exceed any of the following: NOx (as NO2) - 12.2 ppmv @ 15% O2 or CO - 25 ppmv @ 15% O2. [District Rule 4703]
17. Emission rates from GTE, except during startup and/or shutdown, shall not exceed any of the following: NOx (as NO2) - 17.03 lb/hr and 2.5 ppmvd @ 15% O2, VOC - 2.0 ppmvd @ 15% O2, CO - 24.92 lb/hr and 6 ppmvd @ 15% O2 or ammonia - 10 ppmvd @15% O2. NOx (as NO2) emission limit is a one-hour average. Ammonia emission limit is a twenty-four hour rolling average. All other emission limits are three-hour rolling averages. [District Rules 2201, 4001, and 4703]
18. Emission rates from the GTE shall not exceed either of the following: PM10 - 9.0 lb/hr and SOx (as SO2) - 3.495 lb/hr. Emission limits are three-hour rolling averages. [District Rules 2201 and 4001]
19. On any day when a startup or shutdown occurs, emission rates from GTE shall not exceed any of the following: PM10 - 216 lb/day, SOx (as SO2) - 84 lb/day, NOx (as NO2) - 450 lb/day, VOC - 355 lb/day or CO - 2,113 lb/day. [District Rule 2201]
20. Combined annual emissions from GTEs S-3636-1, '2 and '3, calculated on a twelve consecutive month rolling basis, shall not exceed any of the following: PM10 - 224,343 lb/year , SOx (as SO2) - 84,780 lb/year, NOx (as NO2) - 344,484 lb/year, VOC - 227,619 lb/year or CO - 1,220,166 lb/year. [District Rule 2201]
21. Combined annual emissions of all hazardous air pollutants (HAPS) from GETs S-3636-1, '2 and '3, calculated on a twelve consecutive month rolling basis, shall not exceed 25 tons/year. Combined annual emissions of any single HAP from GTEs S-3636-1, '2 and '3, calculated on a twelve consecutive month rolling basis, shall not exceed 10 tons/year. [District Rule 4002]

CONDITIONS CONTINUE ON NEXT PAGE

22. Each one-hour period shall commence on the hour. Each one-hour period in a three-hour rolling average will commence on the hour. The three-hour average will be compiled from the three most recent one-hour periods. Each one-hour period in a twenty-four-hour average for ammonia slip will commence on the hour. The twenty-four-hour average will be calculated starting and ending at twelve-midnight. [District Rule 2201]

23. Daily emissions will be compiled for a twenty-four hour period starting and ending at twelve-midnight. Each month in the twelve-consecutive-month rolling average emissions shall commence at the beginning of the first day of the month. The twelve-consecutive-month rolling average emissions to determine compliance with annual emissions limitations shall be compiled from the twelve most recent calendar months. [District Rule 2201]

24. Prior to operation, permittee shall surrender offsets for S-3636-1-2, '2-2, '3-2, '4-2 and '5-2 for all calendar quarters in the following amounts, at the offset ratio specified in Rule 2201 (6/15/95 version) Table 4.2, PM10 - Q1: 58,305 lb, Q2: 58,953 lb, Q3: 59,601 lb and Q4: 59,602 lb; SOx (as SO2) - Q1: 20,905 lb, Q2: 21,137 lb, Q3: 21,369 lb and Q4: 21,369 lb; NOx (as NO2) - Q1: 80,010 lb, Q2: 80,899 lb, Q3: 81,787 lb, and Q4: 81,788 lb; and VOC - Q1: 51,194 lb Q2: 51,762 lb Q3: 52,331 lb and Q4: 52,332 lb. [District Rule 2201]

25. NOx and VOC emission reductions that occurred from April through November may be used to offset increases in NOx and VOC respectively during any period of the year. [District Rule 2201]

26. NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.42 lb NOx : 1 lb PM10 for reductions occurring within 15 miles of this facility, and at 2.72 lb NOx : 1 lb PM10 for reductions occurring greater than 15 miles from this facility [District Rule 2201]

27. SOx ERCs may be used to offset PM10 emission increases at a ratio of 3.1 lb SOx : 1 lb PM10 for reductions occurring within 15 miles of this facility, and a 3.4 lb SOx : 1 lb PM10 for reductions occurring greater than 15 miles from this facility. [District Rule 2201]

28. At least 30 days prior to commencement of construction, the permittee shall provide the District with written documentation that all necessary offsets have been acquired or that binding contracts to secure such offsets have been entered into. [District Rule 2201]

29. Compliance with ammonia slip limit shall be demonstrated by using the following calculation procedure: ammonia slip ppmv @ 15% O2 = ((a-(bxc/1,000,000)) x 1,000,000 / b) x d, where a = ammonia injection rate(lb/hr)/17(lb/lb. mol), b = dry exhaust gas flow rate (lb/hr)/(29(lb/lb. mol), c = change in measured NOx concentration ppmv at 15% O2 across catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip. Alternatively, permittee may utilize a continuous in-stack ammonia monitor, acceptable to the District, to monitor compliance. At least 60 days prior to using a NH3 CEM, the permittee must submit a monitoring plan for District review and approval [District Rule 4102]

30. Compliance with the short term emission limits (ppmv @ 15% O2 and lb/hr) shall be demonstrated within 90 days of initial operation of each gas turbine engine and annually thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm at full load conditions as follows - NOx: ppmvd @ 15% O2 and lb/hr, CO: ppmvd @ 15% O2 and lb/hr, VOC: ppmvd @ 15% O2 and lb/hr, PM10: lb/hr, and ammonia: ppmvd @ 15% O2. Sample collection to demonstrate compliance with ammonia emission limit shall be based on three consecutive test runs of thirty minutes each. [District Rule 1081]

31. Compliance with the startup NOx, CO, and VOC mass emission limits shall be demonstrated for one of the GTEs (S-3636-1, '2, or '3) upon initial operation and at least every seven years thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. [District Rule 1081]

32. Permittee shall conduct an initial speciated HAPS and total VOC source test for one of the GTEs (S-3636-1, '2 or '3), by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. Pastoria shall correlate the total HAPS emissions rate and the single highest HAP emission rate to the VOC mass emission determined during the speciated HAPs source test. Initial and annual compliance with the HAPS emissions limit (25 tpy all HAPS or 10 tpy any single HAP) shall be by the combined VOC emissions rates for the GTEs (S-3636-1, '2 and '3) determined during initial and annual compliance source testing and the correlation between VOC emissions and HAP(S). [District Rule 4002]

33. Compliance with natural gas sulfur content limit shall be demonstrated within 60 days of operation of each gas turbine engine and periodically as required by 40 CFR 60 Subpart GG and 40 CFR 75. [District Rules 1081, 2540, and 4001]

CONDITIONS CONTINUE ON NEXT PAGE

34. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. Official test results and field data collected by source tests required by conditions on this permit shall be submitted to the District within 60 days of testing. [District Rule 1081]

35. Source test plans for initial and seven-year source tests shall include a method for measuring the VOC/CO surrogate relationship that will be used to demonstrate compliance with VOC lb/hr, lb/day, and lb/twelve month rolling emission limits. [District Rule 2201]

36. The following test methods shall be used PM10: EPA method 5 (front half and back half), NOx: EPA Method 7E or 20, CO: EPA method 10 or 10B, O2: EPA Method 3, 3A, or 20, VOC: EPA method 18 or 25, ammonia: BAAQMD ST-1B, and fuel gas sulfur content: ASTM D3246. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 4001, and 4703]

37. The permittee shall notify District of date of initiation of construction no later than 30 days after such date, date of anticipated startup not more than 60 days nor less than 30 days prior to such date, and date of actual startup within 15 days after such date. [District Rule 4001]

38. The permittee shall maintain hourly records of NOx, CO, and ammonia emission concentrations (ppmv @ 15% O2), and hourly, daily, and twelve month rolling average records of NOx and CO emissions. Compliance with the hourly, daily, and twelve month rolling average VOC emission limits shall be demonstrated by the CO CEM data and the VOC/CO relationship determined by annual CO and VOC source tests. [District Rule 2201]

39. The permittee shall maintain records of SOx lb/hr, lb/day, and lb/twelve month rolling average emission. SOx emissions shall be based on fuel use records, natural gas sulfur content, and mass balance calculations. [District Rule 2201]

40. Permittee shall maintain the following records for the GTE: occurrence, duration, and type of any startup, shutdown, or malfunction; performance testing; emission measurements; total daily and rolling twelve month average hours of operation; hourly quantity of fuel used and gross three hour average operating load. [District Rules 2201 & 4703]

41. Permittee shall maintain the following records for the continuous emissions monitoring system (CEMS): performance testing, evaluations, calibrations, checks, maintenance, adjustments, and any period during which a CEMS was inoperative. [District Rules 2201 & 4703]

42. Permittee shall provide notification and record keeping as required under 40 CFR, Part 60, Subpart A, 60.7. [District Rule 4001]

43. All records required to be maintained by this permit shall be maintained for a period of five years and shall be made readily available for District inspection upon request. [District Rule 2201]

44. Results of continuous emissions monitoring shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3. 3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA. [District Rule 1080]

45. The permittee shall notify the District of any breakdown condition as soon as reasonably possible, but no later than one hour after its detection, unless the owner or operator demonstrates to the Districts satisfaction that the longer reporting period was necessary. [District Rule 1100]

46. The District shall be notified in writing within ten days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the methods utilized to restore normal operations. [District Rule 1100]

47. Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

48. The permittee shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F . [District Rule 1080]

CONDITIONS CONTINUE ON NEXT PAGE

49. The permittee shall submit a written report to the APCO for each calendar quarter, within 30 days of the end of the quarter, including: time intervals, data and magnitude of excess emissions, nature and cause of excess (if known), corrective actions taken and preventive measures adopted; averaging period used for data reporting shall correspond to the averaging period for each respective emission standard; applicable time and date of each period during which the CEM was inoperative (except for zero and span checks) and the nature of system repairs and adjustments; and a negative declaration when no excess emissions occurred . [District Rule 1080]

50. Permittee shall submit an application to comply with Rule 2540 - Acid Rain Program 24 months before the unit commences operation. [District Rule 2540]

San Joaquin Valley
Air Pollution Control District

# AUTHORITY TO CONSTRUCT

**PERMIT NO:** S-3636-3-2 **ISSUANCE DATE:** 06/26/2002

**LEGAL OWNER OR OPERATOR:** PASTORIA ENERGY FACILITY, LLC
**MAILING ADDRESS:** 101 CALIFORNIA STREET, STE 1950
SAN FRANCISCO, CA 94111

**LOCATION:** TEJON RANCH 30 MILES S OF BAKERSFIELD
AND 6.5 MILES E OF GRAPEVINE
RANCHO EL TEJON, CA

**EQUIPMENT DESCRIPTION:**
MODIFICATION OF PREVIOUSLY AUTHORIZED 168 MW NOMINALLY RATED GENERAL ELECTRIC 7FA NATURAL GAS FIRED GAS TURBINE ENGINE/ELECTRICAL GENERATOR #3 WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION OR XONON CATALYTIC COMBUSTOR TECHNOLOGY, HRSG #1, AND 90 MW STEAM TURBINE #2: ELIMINATE OXIDATION CATALYST; ADD POWER AUGMENTATION STEAM INJECTION; REDUCE EXHAUST STACK HEIGHT; LOWER PM10 HOURLY AND PM10, NOX, AND VOC ANNUAL EMISSIONS AND OFFSET QUANTITIES; AND APPROVE SOX AS INTERPOLLUTANT OFFSETS FOR PM10

## CONDITIONS

1. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. Permittee shall submit design details of continuous emission monitoring system and XONON catalytic combustor system or selective catalytic reduction system to the District at least 90 days prior to onsite delivery. [District Rule 2201]
3. Permittee may replace XONON catalytic combustors with selective catalytic reduction system within two years after first operation without receiving a separate approval from the District subject to all the conditions and emissions limits set forth in this approval. [District Rule 2201]
4. Combustion turbine and electrical generator lube oil vents shall be equipped with mist eliminators to maintain visible emissions from lube oil vents no greater than 5% opacity, except for three minutes in any hour. [District Rule 2201]
5. Combustion turbine engine(GTE) shall be equipped with continuously recording fuel gas flowmeter. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

DAVID L. CROW, Executive Director / APCO

RECEIVED
JUL 09 2002

SEYED SADREDIN, Director of Permit Services
S-3636-3-2 : Jun 26 2002 2:46PM – KARRSR : Joint Inspection NOT Required

PEF

6. GTE exhaust shall be equipped with continuously recording emissions monitors (CEM) for NOx, CO, and O2. If SCR NOx control system is used, CTG shall be equipped with an additional CEM for NOx ahead of the SCR unit or, alternatively, a continuously recording ammonia monitor. All CEMs shall be dedicated to this unit and shall meet the requirements of 40 CFR Part 60 Appendices B & F, and 40 CFR Part 75, and shall be capable of monitoring emissions during startups and shutdowns as well as normal operating conditions. If relative accuracy of CEM(s) cannot be certified during startup conditions, CEM results during startup and shutdown events shall be replaced with startup emission rates obtained during source testing to determine compliance with emission limits in conditions 15, 19 and 20. [District Rule 2201]
7. Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District Rule 2201]
8. Exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods. [District Rule 1081]
9. Heat recovery steam generator design shall provide space for additional selective catalytic reduction catalyst and oxidation catalyst if required to meet NOx and CO emission limits. [District Rule 2201]
10. Permittee shall monitor and record exhaust gas temperature at selective catalytic reduction and oxidation catalyst inlets. [District Rule 2201]
11. GTE shall be fired exclusively on natural gas, consisting primarily of methane and ethane, with a sulfur content no greater than 0.75 grains of sulfur compounds (as S) per 100 dry scf of natural gas. [District Rule 2201]
12. Startup is defined as the period beginning with turbine initial firing until the unit meets the lb/hr and ppmv emission limits in condition 17. Shutdown is defined the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Startup and shutdown durations shall not exceed three hours and one hour, respectively, per occurrence. [District Rule 2201 and 4001]
13. Only one of GTEs S3636-1, '2 or '3 shall be in startup at any one time. [District Rule 2201]
14. Ammonia shall be injected when the selective catalytic reduction system catalyst temperature exceeds 500 degrees F. Permittee shall monitor and record catalyst temperature during periods of startup. [District Rule 2201]
15. During startup or shutdown GTE exhaust emissions shall not exceed any of the following: NOx (as NO2) - 130 lb, VOC - 273 lb or CO - 1235 lb, in any one hour. [CEQA]
16. By two hours after turbine initial firing, GTE exhaust emissions shall not exceed any of the following: NOx (as NO2) - 12.2 ppmv @ 15% O2 or CO - 25 ppmv @ 15% O2. [District Rule 4703]
17. Emission rates from GTE, except during startup and/or shutdown, shall not exceed any of the following: NOx (as NO2) - 17.03 lb/hr and 2.5 ppmvd @ 15% O2, VOC - 2.0 ppmvd @ 15% O2, CO - 24.92 lb/hr and 6 ppmvd @ 15% O2 or ammonia - 10 ppmvd @15% O2. NOx (as NO2) emission limit is a one-hour average. Ammonia emission limit is a twenty-four hour rolling average. All other emission limits are three-hour rolling averages. [District Rules 2201, 4001, and 4703]
18. Emission rates from the GTE shall not exceed either of the following: PM10 - 9.0 lb/hr and SOx (as SO2) - 3.495 lb/hr. Emission limits are three-hour rolling averages. [District Rules 2201 and 4001]
19. On any day when a startup or shutdown occurs, emission rates from GTE shall not exceed any of the following: PM10 - 216 lb/day, SOx (as SO2) - 84 lb/day, NOx (as NO2) - 450 lb/day, VOC - 355 lb/day or CO - 2,113 lb/day. [District Rule 2201]
20. Combined annual emissions from GTEs S-3636-1, '2 and '3, calculated on a twelve consecutive month rolling basis, shall not exceed any of the following: PM10 - 224,343 lb/year , SOx (as SO2) - 84,780 lb/year, NOx (as NO2) - 344,484 lb/year, VOC - 227,619 lb/year or CO - 1,220,166 lb/year. [District Rule 2201]
21. Combined annual emissions of all hazardous air pollutants (HAPS) from GETs S-3636-1, '2 and '3, calculated on a twelve consecutive month rolling basis, shall not exceed 25 tons/year. Combined annual emissions of any single HAP from GTEs S-3636-1, '2 and '3, calculated on a twelve consecutive month rolling basis, shall not exceed 10 tons/year. [District Rule 4002]

CONDITIONS CONTINUE ON NEXT PAGE

22. Each one-hour period shall commence on the hour. Each one-hour period in a three-hour rolling average will commence on the hour. The three-hour average will be compiled from the three most recent one-hour periods. Each one-hour period in a twenty-four-hour average for ammonia slip will commence on the hour. The twenty-four-hour average will be calculated starting and ending at twelve-midnight. [District Rule 2201]

23. Daily emissions will be compiled for a twenty-four hour period starting and ending at twelve-midnight. Each month in the twelve-consecutive-month rolling average emissions shall commence at the beginning of the first day of the month. The twelve-consecutive-month rolling average emissions to determine compliance with annual emissions limitations shall be compiled from the twelve most recent calendar months. [District Rule 2201]

24. Prior to operation, permittee shall surrender offsets for S-3636-1-2, '2-2, '3-2, '4-2 and '5-2 for all calendar quarters in the following amounts, at the offset ratio specified in Rule 2201 (6/15/95 version) Table 4.2, PM10 - Q1: 58,305 lb, Q2: 58,953 lb, Q3: 59,601 lb and Q4: 59,602 lb; SOx (as SO2) - Q1: 20,905 lb, Q2: 21,137 lb, Q3: 21,369 lb and Q4: 21,369 lb; NOx (as NO2) - Q1: 80,010 lb, Q2: 80,899 lb, Q3: 81,787 lb, and Q4: 81,788 lb; and VOC - Q1: 51,194 lb Q2: 51,762 lb Q3: 52,331 lb and Q4: 52,332 lb. [District Rule 2201]

25. NOx and VOC emission reductions that occurred from April through November may be used to offset increases in NOx and VOC respectively during any period of the year. [District Rule 2201]

26. NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.42 lb NOx : 1 lb PM10 for reductions occurring within 15 miles of this facility, and at 2.72 lb NOx : 1 lb PM10 for reductions occurring greater than 15 miles from this facility [District Rule 2201]

27. SOx ERCs may be used to offset PM10 emission increases at a ratio of 3.1 lb SOx : 1 lb PM10 for reductions occurring within 15 miles of this facility, and a 3.4 lb SOx : 1 lb PM10 for reductions occurring greater than 15 miles from this facility. [District Rule 2201]

28. At least 30 days prior to commencement of construction, the permittee shall provide the District with written documentation that all necessary offsets have been acquired or that binding contracts to secure such offsets have been entered into. [District Rule 2201]

29. Compliance with ammonia slip limit shall be demonstrated by using the following calculation procedure: ammonia slip ppmv @ 15% O2 = ((a-(bxc/1,000,000)) x 1,000,000 / b) x d, where a = ammonia injection rate(lb/hr)/17(lb/lb. mol), b = dry exhaust gas flow rate (lb/hr)/(29(lb/lb. mol), c = change in measured NOx concentration ppmv at 15% O2 across catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip. Alternatively, permittee may utilize a continuous in-stack ammonia monitor, acceptable to the District, to monitor compliance. At least 60 days prior to using a NH3 CEM, the permittee must submit a monitoring plan for District review and approval [District Rule 4102]

30. Compliance with the short term emission limits (ppmv @ 15% O2 and lb/hr) shall be demonstrated within 90 days of initial operation of each gas turbine engine and annually thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm at full load conditions as follows - NOx: ppmvd @ 15% O2 and lb/hr, CO: ppmvd @ 15% O2 and lb/hr, VOC: ppmvd @ 15% O2 and lb/hr, PM10: lb/hr, and ammonia: ppmvd @ 15% O2. Sample collection to demonstrate compliance with ammonia emission limit shall be based on three consecutive test runs of thirty minutes each. [District Rule 1081]

31. Compliance with the startup NOx, CO, and VOC mass emission limits shall be demonstrated for one of the GTEs (S-3636-1, '2, or '3) upon initial operation and at least every seven years thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. [District Rule 1081]

32. Permittee shall conduct an initial speciated HAPS and total VOC source test for one of the GTEs (S-3636-1, '2 or '3), by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. Pastoria shall correlate the total HAPS emissions rate and the single highest HAP emission rate to the VOC mass emission determined during the speciated HAPs source test. Initial and annual compliance with the HAPS emissions limit (25 tpy all HAPS or 10 tpy any single HAP) shall be by the combined VOC emissions rates for the GTEs (S-3636-1, '2 and '3) determined during initial and annual compliance source testing and the correlation between VOC emissions and HAP(S). [District Rule 4002]

33. Compliance with natural gas sulfur content limit shall be demonstrated within 60 days of operation of each gas turbine engine and periodically as required by 40 CFR 60 Subpart GG and 40 CFR 75. [District Rules 1081, 2540, and 4001]

CONDITIONS CONTINUE ON NEXT PAGE

34. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. Official test results and field data collected by source tests required by conditions on this permit shall be submitted to the District within 60 days of testing. [District Rule 1081]

35. Source test plans for initial and seven-year source tests shall include a method for measuring the VOC/CO surrogate relationship that will be used to demonstrate compliance with VOC lb/hr, lb/day, and lb/twelve month rolling emission limits. [District Rule 2201]

36. The following test methods shall be used PM10: EPA method 5 (front half and back half), NOx: EPA Method 7E or 20, CO: EPA method 10 or 10B, O2: EPA Method 3, 3A, or 20, VOC: EPA method 18 or 25, ammonia: BAAQMD ST-1B, and fuel gas sulfur content: ASTM D3246. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 4001, and 4703]

37. The permittee shall notify District of date of initiation of construction no later than 30 days after such date, date of anticipated startup not more than 60 days nor less than 30 days prior to such date, and date of actual startup within 15 days after such date. [District Rule 4001]

38. The permittee shall maintain hourly records of NOx, CO, and ammonia emission concentrations (ppmv @ 15% O2), and hourly, daily, and twelve month rolling average records of NOx and CO emissions. Compliance with the hourly, daily, and twelve month rolling average VOC emission limits shall be demonstrated by the CO CEM data and the VOC/CO relationship determined by annual CO and VOC source tests. [District Rule 2201]

39. The permittee shall maintain records of SOx lb/hr, lb/day, and lb/twelve month rolling average emission. SOx emissions shall be based on fuel use records, natural gas sulfur content, and mass balance calculations. [District Rule 2201]

40. Permittee shall maintain the following records for the GTE: occurrence, duration, and type of any startup, shutdown, or malfunction; performance testing; emission measurements; total daily and rolling twelve month average hours of operation; hourly quantity of fuel used and gross three hour average operating load. [District Rules 2201 & 4703]

41. Permittee shall maintain the following records for the continuous emissions monitoring system (CEMS): performance testing, evaluations, calibrations, checks, maintenance, adjustments, and any period during which a CEMS was inoperative. [District Rules 2201 & 4703]

42. Permittee shall provide notification and record keeping as required under 40 CFR, Part 60, Subpart A, 60.7. [District Rule 4001]

43. All records required to be maintained by this permit shall be maintained for a period of five years and shall be made readily available for District inspection upon request. [District Rule 2201]

44. Results of continuous emissions monitoring shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3. 3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA. [District Rule 1080]

45. The permittee shall notify the District of any breakdown condition as soon as reasonably possible, but no later than one hour after its detection, unless the owner or operator demonstrates to the Districts satisfaction that the longer reporting period was necessary. [District Rule 1100]

46. The District shall be notified in writing within ten days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the methods utilized to restore normal operations. [District Rule 1100]

47. Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

48. The permittee shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F . [District Rule 1080]

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# APPENDIX 3

## SUMMARY TABLE
## OF
## ACTUAL EMISSIONS FROM
## SIMILAR FACILITY

## Emission Totals (Regular Variance S-02-46R)

| Date | Unit #1 CO (lb/day) | Unit #1 NOX (lb/day) | Unit #2 CO (lb/day) | Unit #2 NOX (lb/day) | Facilitywide CO (lb/day) | Facilitywide NOX (lb/day) | Permit Limits CO (lb/day) | Permit Limits NOX (lb/day) | Excess Emissions CO (lb/day) | Excess Emissions NOX (lb/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Phase I** | | | | | | | | | | |
| 3/16/03 | 198.40 | 170.00 | 0.00 | 0.00 | 198.40 | 170.00 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 3/17/03 | 2,501.10 | 1,113.50 | 3,292.90 | 1,602.30 | 5,794.00 | 2,715.80 | 4,886.8 | 2,341.8 | 907.20 | 374.00 |
| 3/18/03 | 495.10 | 329.40 | 10,314.11 | 3,723.13 | 10,809.21 | 4,052.53 | 4,886.8 | 2,341.8 | 5,922.41 | 1,710.73 |
| 3/19/03 | 6,287.87 | 3,283.61 | 1,745.99 | 648.67 | 8,033.86 | 3,932.28 | 4,886.8 | 2,341.8 | 3,147.06 | 1,590.48 |
| 3/20/03 | 7,470.81 | 829.61 | 294.03 | 87.38 | 7,764.84 | 917.00 | 4,886.8 | 2,341.8 | 2,878.04 | 0.00 |
| 3/21/03 | 1,528.88 | 468.14 | 5,548.17 | 635.24 | 7,077.05 | 1,103.38 | 4,886.8 | 2,341.8 | 2,190.25 | 0.00 |
| 3/22/03 | 5,241.85 | 1,841.31 | 2,817.90 | 1,110.33 | 8,059.75 | 2,951.64 | 4,886.8 | 2,341.8 | 3,172.95 | 609.84 |
| 3/23/03 | 4,691.45 | 1,656.79 | 4,852.63 | 1,617.91 | 9,544.08 | 3,274.70 | 4,886.8 | 2,341.8 | 4,657.28 | 932.90 |
| 3/24/03 | 480.51 | 150.29 | 514.56 | 154.81 | 995.07 | 305.10 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| **Phase II** | | | | | | | | | | |
| 4/19/03 | 39.72 | 8.39 | 0.00 | 0.00 | 39.72 | 8.39 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/20/03 | 72.19 | 235.35 | 0.00 | 0.00 | 72.19 | 235.35 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/21/03 | 43.25 | 1,053.86 | 92.28 | 262.04 | 135.53 | 1,315.90 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/22/03 | 229.89 | 2,886.18 | 0.00 | 0.00 | 229.89 | 2,886.18 | 4,886.8 | 2,341.8 | 0.00 | 544.38 |
| 4/23/03 | 188.29 | 1,862.22 | 0.00 | 0.00 | 188.29 | 1,862.22 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/27/03 | 58.53 | 391.96 | 0.00 | 0.00 | 58.53 | 391.96 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/28/03 | 203.18 | 2,815.89 | 54.27 | 370.54 | 257.45 | 3,186.43 | 4,886.8 | 2,341.8 | 0.00 | 844.63 |
| 4/29/03 | 587.88 | 1,895.34 | 140.59 | 707.59 | 728.47 | 2,602.93 | 4,886.8 | 2,341.8 | 0.00 | 261.13 |
| 4/30/03 | 256.07 | 1,308.70 | 214.33 | 1,402.23 | 470.40 | 2,710.93 | 4,886.8 | 2,341.8 | 0.00 | 369.13 |
| 5/1/03 | 274.63 | 285.20 | 215.22 | 220.70 | 489.85 | 505.90 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/2/03 | 220.54 | 295.04 | 203.79 | 203.00 | 424.33 | 498.04 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/3/03 | 361.50 | 355.45 | 116.66 | 207.11 | 478.16 | 562.56 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/4/03 | 74.33 | 208.16 | 275.47 | 158.15 | 349.80 | 366.31 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/5/03 | 150.18 | 227.54 | 188.89 | 179.11 | 339.07 | 406.65 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/6/03 | 0.00 | 209.64 | 282.16 | 157.28 | 282.16 | 366.92 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/7/03 | 0.00 | 217.56 | 170.23 | 162.14 | 170.23 | 379.70 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/8/03 | 0.00 | 223.28 | 0.00 | 218.00 | 0.00 | 441.28 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/9/03 | 0.04 | 138.39 | 1.10 | 210.48 | 1.14 | 348.87 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/10/03 | 0.00 | 0.00 | 43.96 | 65.35 | 43.96 | 65.35 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/11/03 | 77.05 | 144.31 | 0.00 | 0.00 | 77.05 | 144.31 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/17/03 | 85.93 | 74.40 | 122.96 | 122.13 | 208.89 | 196.53 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/18/03 | 0.00 | 202.92 | 190.25 | 339.31 | 190.25 | 542.23 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/19/03 | 0.00 | 175.41 | 70.24 | 279.01 | 70.24 | 454.42 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/20/03 | 0.02 | 190.71 | 0.00 | 195.64 | 0.02 | 386.35 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/21/03 | 0.59 | 181.61 | 1.28 | 196.70 | 1.87 | 378.31 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/22/03 | 30.40 | 123.14 | 12.13 | 104.78 | 42.53 | 227.92 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/23/03 | 0.00 | 250.58 | 0.18 | 250.35 | 0.18 | 500.93 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/24/03 | 0.00 | 257.72 | 0.00 | 257.67 | 0.00 | 515.39 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/25/03 | 0.00 | 259.37 | 0.00 | 259.28 | 0.00 | 518.65 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/26/03 | 0.00 | 129.05 | 0.00 | 128.98 | 0.00 | 258.03 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/29/03 | 27.37 | 47.40 | 7.39 | 17.39 | 34.76 | 64.79 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/30/03 | 14.88 | 167.09 | 3.51 | 171.85 | 18.39 | 338.94 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/31/03 | 28.02 | 125.32 | 19.00 | 96.72 | 47.02 | 222.04 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| **Variance Limits:** | | | | **Phase I (lb/day)** | **27,513** | **17,770** | | **Total (lb)** | **22,875.18** | **7,237.22** |
| | | | | **Phase II (lb/day)** | **3,345** | **17,770** | | | | |

# APPENDIX 4

# COMMISSIONING VARIANCE MODELING ANALYSIS

## DATA REQUEST 7.

7. Please provide a modeling analysis of the maximum short-term NOx and CO impacts that may occur based on the emission limits being requested in this amendment request. Please provide all input and output files including a description of the meteorological data used in the modeling analysis.

## Data Response 7.

A summary of the requested modeling analysis is provided in the following table. Modeling methodology and a discussion of the meteorological and ozone data sets used in this analysis are provided below. Input, output and meteorological data files are provided on CD-ROM.

**Summary of Modeling Results**
**Maximum Modeled Ambient Concentrations During Commissioning**
**Pastoria Energy Facility**

| Pollutant/ Avg Prd | Max. Modeled Concentration, :g/m$^3$ | Background Concentration, :g/m$^3$ | Total Concentration, :g/m$^3$ | Federal Standard, :g/m$^3$ | State Standard, :g/m$^3$ |
|---|---|---|---|---|---|
| $NO_2$ | | | | | |
| -- one hour | 259 | 165 | 424 | -- | 470 |
| CO | | | | | |
| -- one hour | 3,849 | 18,400 | 22,249 | 40,000 | 23,000 |
| -- eight hours | 940 | 6,670 | 7,610 | 10,000 | 10,000 |

Note: Background concentrations are highest of 2001-2003 readings at the Bakersfield Golden State Hwy monitoring station.

Emission Rates and Stack Parameters

The commissioning modeling assumed that one turbine would be undergoing commissioning and two turbines would be operating at full load. Model inputs are summarized in Attachment AQ-7. Maximum emission rates for the turbine undergoing commissioning were as follows:

NOx: 308 lb/hr (Condition AQ-94)
CO (1-hour average): 2,527 lb/hr (Condition AQ-94)
CO (8-hour average): 1,235 lb/hr (maximum allowable startup emission rate)

Stack parameters for the turbine undergoing commissioning reflect 60 percent load operation (the minimum load for which turbine performance data is available).

Model and Meteorological Data

The modeling analysis was performed using ISCST3; ISC-OLM was used to calculate the maximum 1-hour average $NO_2$ concentration.

Meteorological data was collected at Bakersfield. Several calendar years were evaluated before selecting 1964 met data for this analysis. Before 1964, wind direction was recorded by NWS to every quadrant (22.25 degrees). Using the 1963 Bakersfield met data would have required randomizing wind direction within each 22.5-degree quadrant. In 1964, wind direction was recorded to every 10 degrees for 24 hours per day. After 1964, NWS did not collect data for an eight-hour period each night, so nighttime data are not available for these years. 1964 was used because it provided the most detailed and complete available met data set.

Ozone data for the OLM correction was collected at Arvin in 1996. These data were chosen because they were the most recent available year of ozone from a relatively close location that was also a leap year. The met data and ozone data sets need to have the same number of records; thus the ozone data also had to be from a leap year. Maximum hourly ozone readings in 1992 and 2000 at Arvin were lower than the maximum reading in 1996 (150 and 145 ppb, respectively). Therefore, the 1996 ozone data were also believed to be conservatively high, resulting in higher rather than lower maximum one-hour ozone-limited $NO_2$ concentrations.

Modeling input and output files and meteorological and ozone data files are provided on CD.

PASTORIA ENERGY FACILITY
AMENDMENT REQUEST 2004-0437
DATA RESPONSES
(99-AFC-7C)

# Attachment AQ-7
# Summary of Emission Rates and Stack Parameters

**Pastoria Energy Facility**
**Modeled Impacts During Turbine Commissioning**

| | Stack Diam, m | Stack Height, m | Exh Temp, Deg K | Exhaust Flow, m3/s | Exhaust Velocity, m/s | Emission Rates, g/s | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | NOx | CO 1-hr | CO 8-hr |
| Turbine 1/HRSG | 5.49 | 45.72 | 351.6 | 323.3 | 13.675 | 38.808 | 318.402 | 155.610 |
| Turbine 2/HRSG | 5.49 | 45.72 | 362.3 | 495.8 | 20.971 | 2.146 | 3.140 | 3.140 |
| Turbine 3/HRSG | 5.49 | 45.72 | 362.3 | 495.8 | 20.971 | 2.146 | 3.140 | 3.140 |

| Averaging Period | Pollutant | Modeled Impact, ug/m3 |
|---|---|---|
| 1 hour | NO2 (1) | 259 |
| | CO | 3,849 |
| 8 hour | CO | 940 |

Notes: (1) With ozone limiting.

# PETITION FOR A HEARING
# BEFORE THE HEARING BOARD OF THE
# SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

[ ] Northern Region Office
4230 Kiernan Ave., Ste.130
Modesto, CA 95356
(209) 557-6400

[ ] Central Region Office
1990 E. Gettysburg Ave.
Fresno, CA 93726
(559) 230-5950

[ X ] Southern Region Office
2700 "M" St., Ste. 275
Bakersfield, CA 93301
(661) 326-6900

| TYPE OF HEARING | | FEES (Non-Refundable) |
|---|---|---|
| ( **X** ) A. | Regular Variance | ( **X** ) A. $ 750.00 |
| ( ) B. | Interim & Regular Variance | ( ) B. $1050.00 |
| ( ) C. | Short Variance (90 Days or Less) | ( ) C. $ 650.00 |
| ( ) D. | Interim & Short Variance | ( ) D. $ 950.00 |
| ( ) E. | Emergency Variance | ( ) E. $ 225.00 |
| ( ) F. | Appeal Hearing | ( ) F. $ 750.00 |
| ( ) G. | Extension of Variance | ( ) G. $ 300.00 |
| ( ) H. | Modification of Variance | ( ) H. $ 300.00 |
| ( ) I. | Modification of Variance Schedule of Progress | ( ) I. $ 300.00 |
| ( ) J. | Product Variance | ( ) J. $1000.00 |
| ( ) K. | Rehearing | ( ) K. $ 750.00 |
| ( ) L. | Revocation of Variance | ( ) L. $ 300.00 |
| ( ) M. | Special Hearing | ( ) M. $ 750.00 |
| | | **Total:** |

## PETITION INFORMATION

A. **NAME OF FACILITY:** Pastoria Energy Facility, LLC

**FACILITY LOCATION:** 39789 Edmonston Pumping Plant Road

**CITY:** Lebec **STATE:** California **ZIP CODE:** 93243

**TELEPHONE:** (661) 864-3842 **FAX:** (661) 864-3862

**NAME OF PERSON AUTHORIZED TO RECEIVE NOTICES:** Harry Scarborough

**MAILING ADDRESS:** P.O. Box 866

**CITY:** Lebec **STATE:** California **ZIP CODE:** 93243-9998

**TELEPHONE:** (661) 864-3842 **FAX:** (661) 864-3862

B. **TYPE OF ENTITY (Check One)**

( ) Individual
( ) Co-Partnership
( **X** ) Corporation
( ) Other Entity

Please include the name, title, and address of officers, if a corporation; partners, if a co-partnership; or the person(s) in control if other entity. (Attach additional sheets, if needed)

**NAME** **TITLE** **ADDRESS**

Bryan Bertacchi, VP, Regional Power Executive, 4160 Dublin Blvd., Dublin, CA 94568-3139

| **DISTRICT USE ONLY** | | |
|---|---|---|
| **CHECK NUMBER:** | **RECEIPT NUMBER:** | **DATE RECEIVED:** |

1. **Briefly describe the type of business conducted at your facility.**

Pastoria Energy Facility, LLC is currently in the process of constructing a power production facility to generate and sell electrical power into California's electrical market.

2. **Describe in detail the equipment or activity that is the subject of this petition, what the equipment is used for, and why it is necessary to the operation of your business. Please include all pertinent information necessary to describe the activity including: fuels burned, raw materials processed, product produced, true vapor pressure(s) of all volatile organic compounds, site diagrams, material flow charts, fuel systems, and diagrams of air pollution control systems if necessary. Include copies of all District Permits to Operate and/or Authorities to Construct for each piece of equipment or activity relevant to this variance request.**

Pastoria Energy Facility, LLC (PEF), is located approximately 30 miles south of Bakersfield and 6 miles east of the Grapevine exit off of Intestate Highway 5. The current facility design includes two Power Blocks (Power Block I and Power Block II), combined-cycle electrical power generating units. Power Block I consists of two, nominally rated, 168 MW General Electric 7FA natural gas-fired turbine generating units, equipped with dry low-NOx combustors, that each exhaust into a separate heat recovery steam generator (HRSG) equipped with selective catalytic reduction (SCR), which drive a 185 MW steam generating turbine. Power Block II consists of one 168 MW General Electric 7FA natural gas-fired turbine generating unit, also equipped with dry low-NOx combustion, exhausting into a HRSG equipped with SCR, which drives a separate 90 MW steam turbine. A Power Plant System Schematic for PEF (Power Blocks I & II) is provided in Appendix 1. Upon completion of construction and commissioning activities of both Power Blocks, PEF will supply approximately 779 MW to the California electrical grid.

The current plan for PEF is that Power Block II is scheduled to complete construction the 4$^{th}$ Qtr., 2004/1$^{st}$ Qtr., 2005, and construction of Power Block I is scheduled for completion the 2$^{nd}$ Qtr./3$^{rd}$ Qtr. of 2005. Upon completion of construction, each Power Block will go into a commissioning phase consisting of cleanup, steam blows, tuning and testing prior to being available to supply electricity to the California Electrical Grid.

Commissioning the units is essential to meeting performance guarantees and permit requirements (required for contractual agreements), however, guaranteeing compliance with all applicable permit and regulatory requirements during commissioning activities is not possible, as discussed in detail further in the variance petition. Consequently, PEF has prepared and submitted two (2) variance petitions to be heard by the San Joaquin Valley Air Pollution Control District Hearing Board (Hearing Board), one for Power Block I and the other for Power Block II. This variance petition is for Power Block II, which will be the first phase of construction to be completed, commissioned and put into commercial operation, prior to the completion of Power Block I.

Upon Completion of construction of Power Block II, PEF's Commissioning Group must commission this equipment by performing a series of reduced load firing and system-tuning operations under various operating conditions. These testing activities are normal and necessary procedures to identify and resolve any problems with the construction of Power Block II. These procedures include clearing debris from the HRSG and ducting before the emission control catalyst is installed, cleaning the mill scale from the steam line, tuning the combustion turbine generator (CTG) combustor, tuning control systems, providing for controlled initial operation of the steam generator and synchronizing to the electrical grid.

During the commissioning of Power Block II, emissions from the CTG/HRSG stack will exceed some limits specified in the conditions of Authority to Construct ATC #S-3636-3-2 (Appendix 2). Emissions of NOx, CO and ammonia slip will exceed permit limits, and regulatory limits set for opacity will also be exceeded at various times during the commissioning period. Emissions of $PM_{10}$, VOCs and SOx, however, are expected to meet permit limits during the entire commissioning period. Therefore, a variance is sought from NOx, CO, and ammonia slip emissions limits, and from selected permit conditions and District rules. Power Block II is expected to be in full compliance with all permit conditions within 90 days of commissioning activities.

PEF requests that the Hearing Board of the San Joaquin Valley Air Pollution Control District (District Hearing Board), approve a 90-day variance period that can occur within an 11-month "time window" for commissioning Power Block II. PEF proposes the 90-day variance period to begin upon telephone notification to the District. The 11-month time

window is expected to begin December 1, 2004 and end on October 31, 2005. All schedules presented in this petition are estimates based on experience with similar installations, but subject to uncertainty. The 11-month window is intended to reflect uncertainties in the construction schedule that exist for this complex project and problems that may arise during the commissioning period. Construction of Power Block I and Power Block II is proceeding vigorously on an ambitious schedule but is subject to delays and uncertainties. PEF's goal is to begin commissioning Power Block II at the beginning of the 11-month window and be in full compliance within 90 days thereafter. However, delays in the start of commissioning and completion of testing/tuning may occur within the 11-month window.

If significant equipment or testing problems are encountered, the 90-day commissioning period might be divided into two or more periods that could span more than 90 consecutive calendar days, but elevated emissions during testing/tuning efforts would not exceed 90 days cumulatively. Commissioning may also be accomplished in less than 90 days if no problems are encountered during testing. In recognition of the uncertainty of encountering lengthy delays during commissioning of Power Block II, PEF requests that the District Hearing Board consider allowing the 90-day variance period for Power Block II to be segmented. That is, the duration of the variance relief might exceed 90 consecutive-calendar days, but the commissioning of Power Block II would not exceed 90- cumulative days.

PEF proposes to notify the District upon the start of commissioning (i.e., first fire of the CTG) to commence the 90-day variance period and will notify the District of any problems during commissioning that would extend the duration beyond 90 consecutive calendar days.

The commissioning period for Power Block II will consist of two phases: Phase 1 being a cleanup period when the CTG and HRSG will be operated without the SCR being installed, and Phase 2 being a startup, tuning and synchronization period when the catalysts will be installed.

Phase 1 – Facility Cleanup: This phase will begin immediately after the first fire of the CTG. The SCR will not be in place to prevent contamination, damage and fouling of the catalyst bed from the first, initial firing of the CTG and by residues and debris left in the HRSG as a result of the construction process. Also, during the first several hours (not

expected to exceed 24 hours) of first firing the CTG, the opacity of the exhaust stack and lube oil vents are expected to exceed 20% opacity due to burning off preservative coatings on the new equipment.

The CTG will be slowly brought up to approximately 20 to 40% load and held, generating steam in the HRSG. The steam will be sent through the steam piping of Power Block II and discharged to atmosphere. The CTG will be started and stopped several times during this process in order to move the temporary piping used to clean various systems. These steam blows will be conducted 24 hours per day and are scheduled for seven to ten days, but could extend longer if required to completely clean the CTG, HRSG and other related systems.

Phase 2 – Startup and tuning: After completion of the steam blows, the final piping connections will be made and the SCR catalyst will be installed. The SCR ammonia system will be functional. Thus, emissions will be reduced by the emission control systems during this stage of the commissioning.

The initial work conducted in this phase will consist of CTG and ammonia system tuning, all of which are scheduled to last for 7 to 10 days. The CTG will be slowly brought to full load and subsequently varied to lower loads for tuning purposes. These varied loads will include loads below 60% (the load at which the combustor achieves dry low NOx operation) where the permit emission limits will not be met. During this period, there will be several startups and shutdowns with most startups extending beyond permitted time limits. Also, during the early stages of this phase, the SCR ammonia system will be tuned, and the ammonia slip permit limits may not be met.

Following the tuning process of the CTG, the initial synchronizing and loading process of the steam turbine generator will begin and is scheduled to last for 5 to 10 days. The SCR would be operational as designed. The CTG would be slowly brought up in load as required to slowly heat the steam turbine generator (STG), then the STG will be brought up in speed. Once the STG's synchronous speed is achieved, operation in this mode would occur for several hours. Then the STG would be synchronized to the electric grid and again maintained for a period of time. The STG would then be slowly loaded at various hold points until the CTG's full load is

achieved. The CTG would then be backed down to lower loads and then raised back up to full load, with STG also being introduced to various loads. This process would be repeated several times and could include several attempts involving unit trips, controlled shutdowns and slow startups (mostly hot and warm startups of the STG). Permit limited startup times will be exceeded and emissions limits will be exceeded at various times during this phase of commissioning.

Following STG loading, Power Block II's optimization, performance testing, and reliability run will occur and is expected to take approximately 30 days. The SCR catalyst would be operational as designed. This will involve mostly operation within the permit limits. Several starts and stops will be made. This will include some starts not meeting the permit time and emission limits and potentially some low load operation, which will not meet permit emission limits.

The estimated excess emission rates for NOx and CO are provided in item 12 of this Variance application. These estimated emission rates were derived from a similar facility in Kern County, equipped with two similar 168 MW General Electric 7FA natural gas-fired turbine generating units. The Hearing Board granted this facility a Regular Variance to complete commission activities. A summary of the actual daily emissions emitted from each of the two CTGs during their commissioning phases is attached in Appendix 3. The estimated excess daily emission rates expected from the PEF commissioning activities for Power Block II, were conservatively based upon the highest daily emission rate experienced by this facility during their commission phase.

The PEF 168 MW General Electric 7FA natural gas-fired turbine generating units are very similar to the units producing the emission results in Appendix 3; however, they are not exactly the same Model and Serial #. Other equipment, such as the control equipment, HRSG, steam generator, auxiliary and support equipment are also not the same. Additionally, commission activities are unique to each piece of equipment. Therefore, PEF has increased the estimated excess daily emission rates from the actual emission rates encountered from the other facility by approximately 20%, to account for the potential detrimental differences they may have on emission rates.

The maximum NOx and CO hourly emission rates expected from commissioning activities from both Power Block II and Power Block I were also evaluated in this variance petition. An air dispersion modeling analysis was performed to determine whether emissions during the variance period from the commissioning of these Power Blocks would cause or contribute to an ambient air quality standard (AAQS) violation or Prevention of Significant Deterioration (PSD) increment exceedance. The modeling, provided in Appendix 4, demonstrates that the proposed variance will not cause a violation of applicable short-term AAQS's.

3. **List all Permit to Operate Condition numbers and District Rule numbers, including subsections, for which you are requesting variance relief and explain how you are violating or will violate the condition(s) and/or rule(s).**

The Petitioner is requesting relief from: Conditions 4, 12, 14, 15, 16, 17, 19, 24, 29, 30, 31 and 38 of Authority to Construct #S-3636-3-2 and from District Rules 1081, 2010.4.2, 2070.7.0, 2201, 4001, 4101 and 4703. The Petitioner will, at times, exceed hourly and/or daily stack emission limits during commissioning operations. Commissioning operations include necessary and unavoidable operations of the CTG both prior to and after the installation of the SCR catalyst in order to clean the units of dust and debris and to test and tune the units before commercial operation commences. Also, during the first initial firing of the CTG, visual opacity from the CTG, and lube oil vents are expected to be greater than 20% and 5% respectfully.

Based on the emission estimates provided in Item 12 of this variance petition, PEF is requesting relief from the following Authority to Construct #S-3636-3-2 conditions:

Condition #4: "Combustion turbine and electrical generator lube oil vents shall be equipped with mist eliminators to maintain visible emissions from lube oil vents no greater than 5% opacity, except for three minutes in any hour. [District Rule 2201]"

Variance: During the initial first firing of the CTG the opacity from the CTG and CTG generator lube oil vents are expected to be greater than 5% opacity for the first few hours of operation, not to exceed 24 hours.

Although it is unknown what the maximum opacity will be, it is expected not to exceed 80%.

Condition #12: "Startup is defined as the period beginning with turbine initial firing until the unit meets the lb/hr and ppmv emission limits in condition 17. Shutdown is defined the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Duration of startup and shutdown shall not exceed three hours and one hour, respectively, per occurrence. [District Rule 2201 and 4001]"

Variance: Startup up times will extend beyond these times during steam blows, initial CTG and STG tuning, synchronization, and equipment optimization.

Condition #14: "Ammonia shall be injected when the selective catalytic reduction system catalyst temperature exceeds 500 degrees F. Permittee shall monitor and record catalyst temperature during periods of startup. [District Rule 2201]"

Variance: The SCR catalyst will not be installed during steam blows, and there may be times during the tuning of the ammonia system when the SCR is not functioning at its optimal design and is above 500 degrees F and ammonia is not being injected.

Condition #15: "During startup or shutdown CGT exhaust emissions shall not exceed any of the following: NOx (as NO2) - 130 lb., VOC – 273 lb. or CO -1235 lb., in any one hour. [District Rule 2201]"

Variance: CTG daily emissions during startup and shutdown will exceed values listed for NOx and CO during steam blows, initial CTG and STG tuning, synchronization, and equipment optimization.

Condition #16: "By two hours after turbine initial firing, GTE exhaust emissions shall not exceed any of the following: NOx (as NO2) - 12.2 ppmv @ 15% O2 and CO - 25 ppmv @ 15% O2. [District Rule 4703]"

Variance: CTG emissions will exceed values listed during steam blows, initial CTG and STG tuning, synchronization, and equipment optimization.

Condition #17: "Emission rates from the GTE, except during startup and/or shutdown, shall not exceed any of the following: NOx (as NO2) - 17.03 lb/hr and 2.5 ppmvd @ 15% O2, VOC - 2.0 ppmvd @ 15% O2, CO - 24.92 lb/hr and 6 ppmvd @ 15% O2, ammonia - 10 ppmvd @15%O2. NOx (as NO2) emission limit is a one-hour average. Ammonia emission limit is a twenty-four hour rolling average. All other emission limits are three-hour rolling averages. [District Rules 2201, 4001, and 4703]"

Variance: Emission rates, except SOx, VOC and $PM_{10}$, will exceed values listed during steam blows, initial CTG and STG tuning, synchronization, and equipment optimization. Opacity will also exceed 20% (80% maximum expected) during this period.

Condition #19: "On any day when a startup or shutdown occurs, emission rates from GTE shall not exceed any of the following: PM10: 216 lb/day, SOx (as SO2): 84 lb/day, NOx (as NO2): 450 lb/day, VOC: 355 lb/day, and CO: 2,113 lb/day. [District Rule 2201]"

Variance: Emission rates for NOx and CO will exceed values listed during steam blows, initial CTG and STG tuning, synchronization, and equipment optimization.

Condition #24: "Prior to operation, permittee shall surrender offsets for S-3636-1-2, '2-2, '3-2, '4-2 and '5-2, for all calendar quarters in the following amounts, at the offset ratio specified in Rule 2201 (6/15/95 version) Table 4.2, PM10 - Q1: 58,305 lb, Q2: 58,953 lb, Q3: 59,601 lb, and Q4: 58,602 lb; SOx (as SO2) - Q1: 20,905 lb, Q2: 21,137 lb, Q3: 21,369 lb, and Q4: 21,369 lb; NOx (as NO2) - Q1: 80,010 lb, Q2: 80,899 lb, Q3: 81,787 lb, and Q4: 81,788 lb; and VOC - Q1: 51,194 lb, Q2: 51,762 lb, Q3: 52,331 lb, and Q4: 52,332 lb. [District Rule 2201]"

Variance: The daily emissions limits will be exceeded during the commissioning period and additional Emission Reduction Credits (ERCs) equal to 20% of the excess emissions over one ton will be provided upon District concurrence of this amount. The excess emissions will be determined within 30 days after completion of the commissioning period and submitted to the District for review.

Condition #29: "Compliance with ammonia slip limit shall be demonstrated by using the following calculation procedure: ammonia slip ppmv @ 15%

O2 = ((a-(bxc/1,000,000)) x 1,000,000 / b) x d, where a = ammonia injection rate(lb/hr)/17(lb/lb. mol), b = dry exhaust gas flow rate (lb/hr)/(29(lb/lb. mol), c = change in measured NOx concentration ppmv at 15% O2 across catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip. Alternatively, permittee may utilize a District approved continuous in-stack ammonia monitor to monitor compliance. At least 60 days prior to using a NH3 CEM, the permittee must submit a monitoring plan for District review and approval [District Rule 4102]"

Variance: PEF will calculate ammonia slip during commissioning activities; however, compliance with this condition cannot be met during the commissioning phase until steam blows, initial CTG and STG tuning, and equipment optimization is complete.

Condition #30: "Compliance with the short term emission limits (lb/hr and ppmv @ 15% O2) shall be demonstrated within 90 days of initial operation of each gas turbine engine and annually thereafter by District witnessed in situ sampling of exhaust gasses by a qualified independent source test firm at full load conditions as follows - NOx: ppmvd @ 15% O2 and lb/hr, CO: ppmvd @ 15% O2 and lb/hr, VOC: ppmvd @ 15% O2 and lb/hr, PM10: lb/hr, and ammonia: ppmvd @ 15% O2. Sample collection to demonstrate compliance with ammonia emission limit shall be based on three consecutive test runs of thirty minutes each. [District Rule 1081]"

Variance: If unforeseen commissioning problems arise, compliance demonstration could be delayed until the end of the 11-month time frame, with the understanding that the startup and commissioning activities would not exceed the 90 cumulative days during the 11-month window.

Condition #31: "Compliance with the startup NOx, CO, and VOC mass emission limits shall be demonstrated for one of the GTEs (S-3636-1, '2 or '3) upon initial operation and at least every seven years thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. [District Rule 1081]"

Variance: If unforeseen commissioning problems arise, compliance demonstration could be delayed until the end of the 11-month time frame,

with the understanding that the startup and commissioning activities would not exceed the 90 cumulative days during the 11-month window.

Condition #38: "The permittee shall maintain hourly records of NOx, CO, and ammonia emission concentrations (ppmv @ 15% O2), and hourly, daily, and twelve-month rolling average records of NOx and CO emissions. Compliance with the hourly, daily, and twelve-month rolling average VOC emission limits shall be demonstrated by the CO CEM data and the VOC/CO relationship determined by annual CO and VOC source tests. [District Rule 2201]"

Variance: During the ammonia system tuning, inaccuracies of ammonia injection rates and significant variations in ammonia slip could occur and accurate records may not be available.

As noted at the end of these conditions, PEF will require relief form several District Rules during the commissioning period. Specific Rules are as follows:

- Rule 1081 which establishes time period for compliance testing;
- Rule 2010.4.2 which requires operation according to permit conditions;
- Rule 2070.7.0 which requires operation according to permit conditions;
- Rule 2201 which requires emissions control equipment to be on-line at all times;
- Rule 4001 which incorporates the new source performance standards;
- Rule 4101 which establishes limits for visible emissions; and
- Rule 4703 which establishes emissions limits for NOx and CO.

4. **Is the equipment or activity subject to this request currently under a District variance? Yes: __ No: X__ If yes, give the Docket Number, date of the last variance action, final compliance date, and a brief explanation.**

5. **Have you received a variance for any other equipment or activity at this location within the previous six months? Yes: _____No: ____X If yes, give the Docket Number(s), date(s), final compliance date, and a brief explanation.**

6. **Why is it beyond your reasonable control to comply with the rule(s) and/or permit condition(s)?**

The Petitioner cannot comply with permit conditions and District Rules during the Power Block II commissioning period because the emission control equipment will not be installed and operational at all times. Operation prior to installation of control equipment is necessary to clean out dust and debris from the HRSG and CTG exhaust path. This dust and debris would damage the SCR catalysts if it were in the exhaust path. Additionally, after installation of control equipment the CTG and STG and control equipment will require tuning and testing at various operating loads to minimize emissions and achieve compliance with all permit conditions. Commissioning the units is essential to establish that the units meet performance guarantees and permit requirements (required for contractual agreements), but guaranteeing compliance during commissioning activities is not possible. There is no expedient or practical alternative means of complying with all permit conditions and District Rules during the commissioning period.

7. **What would be the harm to your business if the variance were not granted? Include business closure, economic losses in dollar amounts, breach of contracts, hardships on customers, employee lay-offs, and similar matters.**

Commissioning activities are necessary, and there is no alternative to conducting commissioning activities. If the variance is not granted, Petitioner would have no alternative other than to abandon this project before completion of construction, which would amount to the closing or taking of the Petitioner's business. Millions of dollars in sunk costs for site acquisition, engineering, design, permitting, site preparation and construction would be lost, and several dozens of prospective jobs at the facility would be lost. Petitioner could also become subject to claims amounting to millions of dollars for breach of contracts entered into as part of the project. The likelihood of future interruptions in power supply, especially in the southern California area, would be increased.

8. **When, and under what circumstances, did your company first become aware that it would not be in compliance?**

PEF became aware that it would not be in compliance with its permit limits, and that the District would be enforcing the permit limits during

commissioning activities, shortly before submitting a permit application to include commissioning conditions, in March 2004.

**9. What actions have you taken since that time to achieve compliance?**

Initially, PEF attempted to resolve the issue through communications and negotiations with District staff. PEF submitted a permit application to the District on March 19, 2004, requesting that an allowance for commissioning activities be added to its permit conditions. Although early power projects in the District had sought variance relief for commissioning activities, PEF believed that a modification of its Authorities to Construct would be more consistent with recent District practices. However, after preparing and filing the permit application, and performing additional requested dispersion modeling analyses, PEF was informed by the District that it either had to modify the project to meet current BACT requirements or seek a variance to address the commissioning issue. PEF has also hired a consultant, Sierra Research, to assist in seeking variance relief and to provide expertise and advice towards achieving compliance.

**10. Explain what options have been evaluated towards curtailment or termination of operations in lieu of obtaining a variance.**

Curtailing operations will not result in compliance since commissioning requires operation under all operating modes and loads, and must be completed prior to commercial operation of the turbines. Termination of operation would result in significant monetary losses and the potential disruption of power supply.

**11. Will there be excess emissions (emissions in excess of those allowed by the rules or permit conditions), including hazardous or toxic emissions, during this variance period? Yes: _X___ No: ___ If no, explain why there will be no excess emissions and then continue to number 16.**

Excess emissions of NOx and CO and ammonia slip are expected to occur during commissioning of the unit, as described previously in Items 2 and 3.

No excess hazardous or toxic emissions are expected. Fuel usage during commissioning will not exceed the maximum fuel use provided in the

original permit application materials. Therefore, hazardous and toxic emissions during commissioning are not expected to be greater than emissions demonstrated during normal operation.

**12. Estimate the daily excess emissions on a pounds per day basis or, if applicable, the percent opacity of visible emissions during the variance period.**

The table below lists estimated maximum daily excess NOx and CO emissions for commissioning Power Block II. These estimates are based on maximum daily emissions at a similar facility during its commissioning phases, and represent worst-case operating conditions that might occur as described previously. Actual excess daily emissions are not expected to be this high everyday during the commissioning period of Power Block II. However, due to the complexity of commissioning and unforeseen conditions that may been encountered, PEF is unable to predict which days may reach these levels and is seeking relief from these daily limits throughout the 90-day cumulative commissioning period.

Expected maximum opacity during this period for the CTG, CTG lube oil vent and CTG generator lube oil vent is 80%. In addition, no daily emission limit (in lbs/day) is set for ammonia slip and, therefore, is not included.

**ATC #S-3636-3-2**

| Pollutant | Permit limit one turbine (lbs/day) | Total Estimated Emissions (lbs/day) | Reduction Due to Mitigation (lbs/day) | Net Excess Emissions After Mitigation (lbs/day) |
|---|---|---|---|---|
| NOx | 450 | 4,500 | 0 | 4,050 |
| CO | 2,113 | 12,500 | 0 | 10,387 |

**13. Please show all calculations and provide references for emission factors used in estimating excess emissions.**

As previously discussed, these estimated emission rates were derived from a similar facility in Kern County, equipped with similar 168 MW General Electric 7FA natural gas-fired turbine generating units. The Hearing Board also granted this facility a Regular Variance to complete commission activities. Appendix 1 includes a summary of the actual daily emissions emitted from the facility from each of their CTGs during their commissioning phases. The estimated excess daily emission rates expected from the PEF commissioning activities for Power Block II, were conservatively based upon the highest daily emission rate experienced by this facility during their commission phase.

These 168 MW General Electric 7FA natural gas-fired turbine generating units are very similar, however, they are not exact in Model and Serial #. Other equipment, such as the control equipment, HRSG, steam generator, auxiliary and support equipment are not the same. Additionally, commission activities are unique to each piece of equipment. Therefore, PEF has increased the estimated excess daily emission rates from the actual emission rates encountered from the other facility by approximately 20%, to account for the potential detrimental differences they may have on emission rates.

- 10,314.11 lbs/day CO x 1.20 ≈ 12,500 lbs/day CO
- 3723.13 lbs/day NOx x 1.20 ≈ 4,500 lbs/day NOx

The proposed maximum hourly emission rates of NOx (308 lbs/hr) and CO (2,527 lbs/hr), for commissioning this CTG, were also derived from a similar facility during commissioning activities. The insignificant impact of these emission rates on air quality is discussed further in item 15 of this petition.

**14. If there are excessive hazardous or toxic emissions, attach a health risk assessment and receptor modeling data.**

No excess hazardous or toxic emissions are expected. Fuel usage during commissioning will not exceed the maximum fuel use provided in the original permit application materials. Therefore, hazardous and toxic emissions during commissioning are not expected to be greater than emissions demonstrated during normal operation.

**15. Explain how you can reduce or mitigate excess emissions from the subject equipment, other facility equipment (in order to offset excess emissions), or other activity to the maximum extent feasible during the variance period.**

PEF has assessed the facility's ambient air quality impacts during commissioning periods and confirmed that excess emissions from commissioning activities will not cause or contribute to a modeled violation of ambient air quality standards. Conservative air quality impact

assessment techniques were used to estimate maximum impacts from worst-case facility-wide emissions. The results of the modeling are provided in Appendix 4. The resulting maximum project NOx ambient impact (259 $\mu g/m^3$), when added to the maximum background NOx level measured in the Arvin area (165 $\mu g/m^3$), is below the state 1-hour NOx standard of 470 $\mu g/m^3$. Maximum CO impacts during commissioning will be less than the State/federal significant impact levels as noted in Appendix 4.

Consistent with District New Source review policy, no mitigation is necessary for CO because the region is attainment for CO and ambient impacts during commissioning will not be significant.

PEF understands that the District requires mitigation when cumulative excess emissions during a variance period exceed 1 ton per pollutant from an emissions unit. PEF also understands that 20% of excess emissions, above 1 ton, has been a typical level of mitigation required for past variance proceedings in the District. Since this commissioning period is a one-time event, PEF believes that the 20% level of offsets is a reasonable mitigation.

The project will exceed the daily NOx emission rates during the commissioning period. PEF proposes to mitigate these excess emissions by surrendering pre or post 1990 NOx ERCs to the District after commissioning of Power Block II is complete and actual excess NOx emission have been determined. ERC's equal to 20% of the excess emissions over one ton will be provided upon District concurrence of this amount. The excess emissions will be determined within 30 days after completion of the commissioning period and submitted to the District for review.

**16. Can you monitor or quantify emission levels from the subject equipment or activity during the variance period and make such records available to the District? Yes: __X__ No: _____ Provide an explanation of your response.**

Petitioner will install and operate a continuous emissions monitoring (CEM) system to measure and record NOx, CO, and O2 emissions rates and concentrations, and will continuously measure and record fuel flow rate to the CTG. In the event that the CEM system is unavailable during

commissioning operations, PEF will make its best effort to utilize a qualified independent source test firm to measure and record NOx, CO, and O2 emissions rates and concentrations.

**17. How do you intend to achieve compliance with the rule(s) or permit condition(s)? Include a detailed description of any equipment to be installed and/or modifications to be made, a listing of the dates by which the actions will be completed, and an estimate of the total cost, if available.**

During commissioning, turbine and emission control equipment will be continuously cleaned, tested and adjusted to them into compliance as quickly as possible. PEF has a strong economic incentive to complete commissioning as quickly as possible in order to be able to sell power to the grid.

**18. Please state the dates you are requesting the variance to begin and end (the end date should be the date you expect to achieve compliance with the rules, regulations, and permit conditions).**

Begin variance: December 1, 2004
End variance: October 31, 2005

The estimated schedule for first fire of Power Block II is December 15, 2004. If commissioning activities are completed within 90-consecutive calendar days, Power Block II will begin normal operations on March 15, 2005. However, due to all the previously mentioned complexities involved with constructing a power generating facility of this magnitude and size, including Power Block I, PEF is requesting a Regular Variance from 12/1/04 until 10/31/05, with commissioning activities not to exceed a total of 90-cumulative operating days.

**19. If a regular variance is to extend over one year, you must attach a Schedule of Increments of Progress which must specify certain dates or milestones to be met in achieving compliance.**

Petitioner is not seeking variance relief for more than one year.

**20. Were you issued a Notice of Violation or Notice to Comply concerning the current operation of this equipment or activity?**

**Yes: ____ No: _X_ If yes, please attach a copy of the notice.**

21. **Please list the names of any District personnel who are familiar with the facility or with whom facility representatives have had contact concerning this variance petition, or any related Notice of Violation or Notice to Comply.**

Permit Services: Seyed Sadredin, Tom Goff and Richard Karrs.
Compliance: Creighton Smith.

22. **Have you received any complaints from members of the public regarding the operation of the subject facility, equipment, or related activities within the last six (6) months? Yes: _____ No: _X_ If yes, indicate date(s), nature of complaint(s), and address(s) of complainant(s).**

**The undersigned, under penalty of perjury, states that the above petition, including attachments, and the items therein set forth are true and correct.**

**Date:** August 31, 2004 **Signature:** _____

**Title:** Plant Manager

**Print Name:** Harry Scarborough

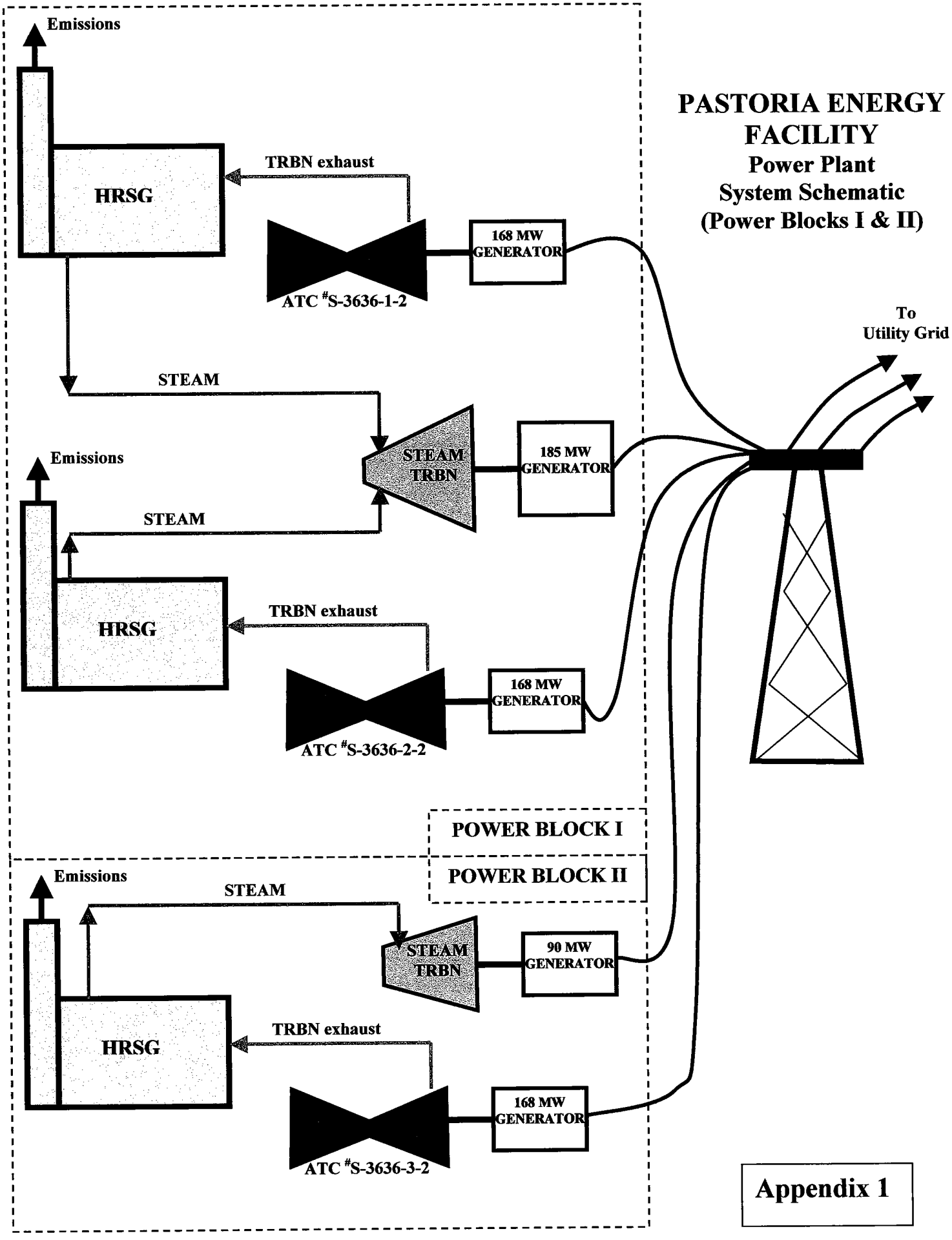
**The original petition in this format with 15 copies of any attachments must be submitted to the District. Petitions which are incomplete, illegible, submitted in the wrong format, or without the necessary filing fee will be returned. If you need assistance completing this Petition and/or developing a compliance schedule, contact the Compliance Division in your region.**

# APPENDIX 1

## PASTORIA ENERGY FACILITY
## Power Plant Schematic
## (Power Blocks I & II)

# PASTORIA ENERGY FACILITY

## Power Plant System Schematic (Power Blocks I & II)




**Appendix 1**

# APPENDIX 2

## COPY OF
## ATC #S-3636-3-2

San Joaquin Valley
Air Pollution Control District

# AUTHORITY TO CONSTRUCT

**PERMIT NO:** S-3636-1-2 **ISSUANCE DATE:** 06/26/2002

**LEGAL OWNER OR OPERATOR:** PASTORIA ENERGY FACILITY, LLC
**MAILING ADDRESS:** 101 CALIFORNIA STREET, STE 1950
SAN FRANCISCO, CA 94111

**LOCATION:** TEJON RANCH 30 MILES S OF BAKERSFIELD
AND 6.5 MILES E OF GRAPEVINE
RANCHO EL TEJON, CA

**EQUIPMENT DESCRIPTION:**
REVISION OF PREVIOUSLY AUTHORIZED 168 MW NOMINALLY RATED GENERAL ELECTRIC 7FA NATURAL GAS FIRED GAS TURBINE ENGINE/ELECTRICAL GENERATOR #1 WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION OR XONON CATALYTIC COMBUSTOR TECHNOLOGY, HRSG #1, AND A SINGLE 185 MW STEAM TURBINE #1 SHARED WITH GAS TURBINE ENGINE S-3636-2: ELIMINATE OXIDATION CATALYST; ADD POWER AUGMENTATION STEAM INJECTION; REDUCE EXHAUST STACK HEIGHT; LOWER PM10 HOURLY AND PM10, NOX, AND VOC ANNUAL EMISSIONS AND OFFSET QUANTITIES; AND APPROVE SOX AS INTERPOLLUTANT OFFSETS FOR PM10

## CONDITIONS

1. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. Permittee shall submit design details of continuous emission monitoring system and XONON catalytic combustor system or selective catalytic reduction system to the District at least 90 days prior to onsite delivery. [District Rule 2201]
3. Permittee may replace XONON catalytic combustors with selective catalytic reduction system within two years after first operation without receiving a separate approval from the District subject to all the conditions and emissions limits set forth in this approval. [District Rule 2201]
4. Combustion turbine and electrical generator lube oil vents shall be equipped with mist eliminators to maintain visible emissions from lube oil vents no greater than 5% opacity, except for three minutes in any hour. [District Rule 2201]
5. Combustion turbine engine(GTE) shall be equipped with continuously recording fuel gas flowmeter. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

DAVID L. CROW, Executive Director / APCO

RECEIVED
JUL 09 2002
PEF

SEYED SADREDIN, Director of Permit Services
S-3636-1-2: Jun 26 2002 2:46PM -- KARRSR : Joint Inspection NOT Required

6. GTE exhaust shall be equipped with continuously recording emissions monitors (CEM) for NOx, CO, and O2. If SCR NOx control system is used, CTG shall be equipped with an additional CEM for NOx ahead of the SCR unit or, alternatively, a continuously recording ammonia monitor. All CEMs shall be dedicated to this unit and shall meet the requirements of 40 CFR Part 60 Appendices B & F, and 40 CFR Part 75, and shall be capable of monitoring emissions during startups and shutdowns as well as normal operating conditions. If relative accuracy of CEM(s) cannot be certified during startup conditions, CEM results during startup and shutdown events shall be replaced with startup emission rates obtained during source testing to determine compliance with emission limits in conditions 15, 19 and 20. [District Rule 2201]
7. Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District Rule 2201]
8. Exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods. [District Rule 1081]
9. Heat recovery steam generator design shall provide space for additional selective catalytic reduction catalyst and oxidation catalyst if required to meet NOx and CO emission limits. [District Rule 2201]
10. Permittee shall monitor and record exhaust gas temperature at selective catalytic reduction and oxidation catalyst inlets. [District Rule 2201]
11. GTE shall be fired exclusively on natural gas, consisting primarily of methane and ethane, with a sulfur content no greater than 0.75 grains of sulfur compounds (as S) per 100 dry scf of natural gas. [District Rule 2201]
12. Startup is defined as the period beginning with turbine initial firing until the unit meets the lb/hr and ppmv emission limits in condition 17. Shutdown is defined the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Startup and shutdown durations shall not exceed three hours and one hour, respectively, per occurrence. [District Rule 2201 and 4001]
13. Only one of GTEs S3636-1, '2 or '3 shall be in startup at any one time. [District Rule 2201]
14. Ammonia shall be injected when the selective catalytic reduction system catalyst temperature exceeds 500 degrees F. Permittee shall monitor and record catalyst temperature during periods of startup. [District Rule 2201]
15. During startup or shutdown GTE exhaust emissions shall not exceed any of the following: NOx (as NO2) - 130 lb, VOC - 273 lb or CO - 1235 lb, in any one hour. [CEQA]
16. By two hours after turbine initial firing, GTE exhaust emissions shall not exceed any of the following: NOx (as NO2) - 12.2 ppmv @ 15% O2 or CO - 25 ppmv @ 15% O2. [District Rule 4703]
17. Emission rates from GTE, except during startup and/or shutdown, shall not exceed any of the following: NOx (as NO2) - 17.03 lb/hr and 2.5 ppmvd @ 15% O2, VOC - 2.0 ppmvd @ 15% O2, CO - 24.92 lb/hr and 6 ppmvd @ 15% O2 or ammonia - 10 ppmvd @15% O2. NOx (as NO2) emission limit is a one-hour average. Ammonia emission limit is a twenty-four hour rolling average. All other emission limits are three-hour rolling averages. [District Rules 2201, 4001, and 4703]
18. Emission rates from the GTE shall not exceed either of the following: PM10 - 9.0 lb/hr and SOx (as SO2) - 3.495 lb/hr. Emission limits are three-hour rolling averages. [District Rules 2201 and 4001]
19. On any day when a startup or shutdown occurs, emission rates from GTE shall not exceed any of the following: PM10 - 216 lb/day, SOx (as SO2) - 84 lb/day, NOx (as NO2) - 450 lb/day, VOC - 355 lb/day or CO - 2,113 lb/day. [District Rule 2201]
20. Combined annual emissions from GTEs S-3636-1, '2 and '3, calculated on a twelve consecutive month rolling basis, shall not exceed any of the following: PM10 - 224,343 lb/year , SOx (as SO2) - 84,780 lb/year, NOx (as NO2) - 344,484 lb/year, VOC - 227,619 lb/year or CO - 1,220,166 lb/year. [District Rule 2201]
21. Combined annual emissions of all hazardous air pollutants (HAPS) from GETs S-3636-1, '2 and '3, calculated on a twelve consecutive month rolling basis, shall not exceed 25 tons/year. Combined annual emissions of any single HAP from GTEs S-3636-1, '2 and '3, calculated on a twelve consecutive month rolling basis, shall not exceed 10 tons/year. [District Rule 4002]

CONDITIONS CONTINUE ON NEXT PAGE

22. Each one-hour period shall commence on the hour. Each one-hour period in a three-hour rolling average will commence on the hour. The three-hour average will be compiled from the three most recent one-hour periods. Each one-hour period in a twenty-four-hour average for ammonia slip will commence on the hour. The twenty-four-hour average will be calculated starting and ending at twelve-midnight. [District Rule 2201]

23. Daily emissions will be compiled for a twenty-four hour period starting and ending at twelve-midnight. Each month in the twelve-consecutive-month rolling average emissions shall commence at the beginning of the first day of the month. The twelve-consecutive-month rolling average emissions to determine compliance with annual emissions limitations shall be compiled from the twelve most recent calendar months. [District Rule 2201]

24. Prior to operation, permittee shall surrender offsets for S-3636-1-2, '2-2, '3-2, '4-2 and '5-2 for all calendar quarters in the following amounts, at the offset ratio specified in Rule 2201 (6/15/95 version) Table 4.2, PM10 - Q1: 58,305 lb, Q2: 58,953 lb, Q3: 59,601 lb and Q4: 59,602 lb; SOx (as SO2) - Q1: 20,905 lb, Q2: 21,137 lb, Q3: 21,369 lb and Q4: 21,369 lb; NOx (as NO2) - Q1: 80,010 lb, Q2: 80,899 lb, Q3: 81,787 lb, and Q4: 81,788 lb; and VOC - Q1: 51,194 lb Q2: 51,762 lb Q3: 52,331 lb and Q4: 52,332 lb. [District Rule 2201]

25. NOx and VOC emission reductions that occurred from April through November may be used to offset increases in NOx and VOC respectively during any period of the year. [District Rule 2201]

26. NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.42 lb NOx : 1 lb PM10 for reductions occurring within 15 miles of this facility, and at 2.72 lb NOx : 1 lb PM10 for reductions occurring greater than 15 miles from this facility [District Rule 2201]

27. SOx ERCs may be used to offset PM10 emission increases at a ratio of 3.1 lb SOx : 1 lb PM10 for reductions occurring within 15 miles of this facility, and a 3.4 lb SOx : 1 lb PM10 for reductions occurring greater than 15 miles from this facility. [District Rule 2201]

28. At least 30 days prior to commencement of construction, the permittee shall provide the District with written documentation that all necessary offsets have been acquired or that binding contracts to secure such offsets have been entered into. [District Rule 2201]

29. Compliance with ammonia slip limit shall be demonstrated by using the following calculation procedure: ammonia slip ppmv @ 15% O2 = ((a-(bxc/1,000,000)) x 1,000,000 / b) x d, where a = ammonia injection rate(lb/hr)/17(lb/lb. mol), b = dry exhaust gas flow rate (lb/hr)/(29(lb/lb. mol), c = change in measured NOx concentration ppmv at 15% O2 across catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip. Alternatively, permittee may utilize a continuous in-stack ammonia monitor, acceptable to the District, to monitor compliance. At least 60 days prior to using a NH3 CEM, the permittee must submit a monitoring plan for District review and approval [District Rule 4102]

30. Compliance with the short term emission limits (ppmv @ 15% O2 and lb/hr) shall be demonstrated within 90 days of initial operation of each gas turbine engine and annually thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm at full load conditions as follows - NOx: ppmvd @ 15% O2 and lb/hr, CO: ppmvd @ 15% O2 and lb/hr, VOC: ppmvd @ 15% O2 and lb/hr, PM10: lb/hr, and ammonia: ppmvd @ 15% O2. Sample collection to demonstrate compliance with ammonia emission limit shall be based on three consecutive test runs of thirty minutes each. [District Rule 1081]

31. Compliance with the startup NOx, CO, and VOC mass emission limits shall be demonstrated for one of the GTEs (S-3636-1, '2, or '3) upon initial operation and at least every seven years thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. [District Rule 1081]

32. Permittee shall conduct an initial speciated HAPS and total VOC source test for one of the GTEs (S-3636-1, '2 or '3), by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. Pastoria shall correlate the total HAPS emissions rate and the single highest HAP emission rate to the VOC mass emission determined during the speciated HAPs source test. Initial and annual compliance with the HAPS emissions limit (25 tpy all HAPS or 10 tpy any single HAP) shall be by the combined VOC emissions rates for the GTEs (S-3636-1, '2 and '3) determined during initial and annual compliance source testing and the correlation between VOC emissions and HAP(S). [District Rule 4002]

33. Compliance with natural gas sulfur content limit shall be demonstrated within 60 days of operation of each gas turbine engine and periodically as required by 40 CFR 60 Subpart GG and 40 CFR 75. [District Rules 1081, 2540, and 4001]

CONDITIONS CONTINUE ON NEXT PAGE

34. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. Official test results and field data collected by source tests required by conditions on this permit shall be submitted to the District within 60 days of testing. [District Rule 1081]

35. Source test plans for initial and seven-year source tests shall include a method for measuring the VOC/CO surrogate relationship that will be used to demonstrate compliance with VOC lb/hr, lb/day, and lb/twelve month rolling emission limits. [District Rule 2201]

36. The following test methods shall be used PM10: EPA method 5 (front half and back half), NOx: EPA Method 7E or 20, CO: EPA method 10 or 10B, O2: EPA Method 3, 3A, or 20, VOC: EPA method 18 or 25, ammonia: BAAQMD ST-1B, and fuel gas sulfur content: ASTM D3246. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 4001, and 4703]

37. The permittee shall notify District of date of initiation of construction no later than 30 days after such date, date of anticipated startup not more than 60 days nor less than 30 days prior to such date, and date of actual startup within 15 days after such date. [District Rule 4001]

38. The permittee shall maintain hourly records of NOx, CO, and ammonia emission concentrations (ppmv @ 15% O2), and hourly, daily, and twelve month rolling average records of NOx and CO emissions. Compliance with the hourly, daily, and twelve month rolling average VOC emission limits shall be demonstrated by the CO CEM data and the VOC/CO relationship determined by annual CO and VOC source tests. [District Rule 2201]

39. The permittee shall maintain records of SOx lb/hr, lb/day, and lb/twelve month rolling average emission. SOx emissions shall be based on fuel use records, natural gas sulfur content, and mass balance calculations. [District Rule 2201]

40. Permittee shall maintain the following records for the GTE: occurrence, duration, and type of any startup, shutdown, or malfunction; performance testing; emission measurements; total daily and rolling twelve month average hours of operation; hourly quantity of fuel used and gross three hour average operating load. [District Rules 2201 & 4703]

41. Permittee shall maintain the following records for the continuous emissions monitoring system (CEMS): performance testing, evaluations, calibrations, checks, maintenance, adjustments, and any period during which a CEMS was inoperative. [District Rules 2201 & 4703]

42. Permittee shall provide notification and record keeping as required under 40 CFR, Part 60, Subpart A, 60.7. [District Rule 4001]

43. All records required to be maintained by this permit shall be maintained for a period of five years and shall be made readily available for District inspection upon request. [District Rule 2201]

44. Results of continuous emissions monitoring shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3. 3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA. [District Rule 1080]

45. The permittee shall notify the District of any breakdown condition as soon as reasonably possible, but no later than one hour after its detection, unless the owner or operator demonstrates to the Districts satisfaction that the longer reporting period was necessary. [District Rule 1100]

46. The District shall be notified in writing within ten days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the methods utilized to restore normal operations. [District Rule 1100]

47. Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

48. The permittee shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F . [District Rule 1080]

CONDITIONS CONTINUE ON NEXT PAGE

49. The permittee shall submit a written report to the APCO for each calendar quarter, within 30 days of the end of the quarter, including: time intervals, data and magnitude of excess emissions, nature and cause of excess (if known), corrective actions taken and preventive measures adopted; averaging period used for data reporting shall correspond to the averaging period for each respective emission standard; applicable time and date of each period during which the CEM was inoperative (except for zero and span checks) and the nature of system repairs and adjustments; and a negative declaration when no excess emissions occurred . [District Rule 1080]

50. Permittee shall submit an application to comply with Rule 2540 - Acid Rain Program 24 months before the unit commences operation. [District Rule 2540]

# APPENDIX 3

## SUMMARY TABLE
## OF
## ACTUAL EMISSIONS FROM
## SIMILAR FACILITY

## Emission Totals (Regular Variance S-02-46R)

| Date | Unit #1 CO (lb/day) | Unit #1 NOX (lb/day) | Unit #2 CO (lb/day) | Unit #2 NOX (lb/day) | Facilitywide CO (lb/day) | Facilitywide NOX (lb/day) | Permit Limits CO (lb/day) | Permit Limits NOX (lb/day) | Excess Emissions CO (lb/day) | Excess Emissions NOX (lb/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Phase I** | | | | | | | | | | |
| 3/16/03 | 198.40 | 170.00 | 0.00 | 0.00 | 198.40 | 170.00 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 3/17/03 | 2,501.10 | 1,113.50 | 3,292.90 | 1,602.30 | 5,794.00 | 2,715.80 | 4,886.8 | 2,341.8 | 907.20 | 374.00 |
| 3/18/03 | 495.10 | 329.40 | 10,314.11 | 3,723.13 | 10,809.21 | 4,052.53 | 4,886.8 | 2,341.8 | 5,922.41 | 1,710.73 |
| 3/19/03 | 6,287.87 | 3,283.61 | 1,745.99 | 648.67 | 8,033.86 | 3,932.28 | 4,886.8 | 2,341.8 | 3,147.06 | 1,590.48 |
| 3/20/03 | 7,470.81 | 829.61 | 294.03 | 87.38 | 7,764.84 | 917.00 | 4,886.8 | 2,341.8 | 2,878.04 | 0.00 |
| 3/21/03 | 1,528.88 | 468.14 | 5,548.17 | 635.24 | 7,077.05 | 1,103.38 | 4,886.8 | 2,341.8 | 2,190.25 | 0.00 |
| 3/22/03 | 5,241.85 | 1,841.31 | 2,817.90 | 1,110.33 | 8,059.75 | 2,951.64 | 4,886.8 | 2,341.8 | 3,172.95 | 609.84 |
| 3/23/03 | 4,691.45 | 1,656.79 | 4,852.63 | 1,617.91 | 9,544.08 | 3,274.70 | 4,886.8 | 2,341.8 | 4,657.28 | 932.90 |
| 3/24/03 | 480.51 | 150.29 | 514.56 | 154.81 | 995.07 | 305.10 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| **Phase II** | | | | | | | | | | |
| 4/19/03 | 39.72 | 8.39 | 0.00 | 0.00 | 39.72 | 8.39 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/20/03 | 72.19 | 235.35 | 0.00 | 0.00 | 72.19 | 235.35 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/21/03 | 43.25 | 1,053.86 | 92.28 | 262.04 | 135.53 | 1,315.90 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/22/03 | 229.89 | 2,886.18 | 0.00 | 0.00 | 229.89 | 2,886.18 | 4,886.8 | 2,341.8 | 0.00 | 544.38 |
| 4/23/03 | 188.29 | 1,862.22 | 0.00 | 0.00 | 188.29 | 1,862.22 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/27/03 | 58.53 | 391.96 | 0.00 | 0.00 | 58.53 | 391.96 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/28/03 | 203.18 | 2,815.89 | 54.27 | 370.54 | 257.45 | 3,186.43 | 4,886.8 | 2,341.8 | 0.00 | 844.63 |
| 4/29/03 | 587.88 | 1,895.34 | 140.59 | 707.59 | 728.47 | 2,602.93 | 4,886.8 | 2,341.8 | 0.00 | 261.13 |
| 4/30/03 | 256.07 | 1,308.70 | 214.33 | 1,402.23 | 470.40 | 2,710.93 | 4,886.8 | 2,341.8 | 0.00 | 369.13 |
| 5/1/03 | 274.63 | 285.20 | 215.22 | 220.70 | 489.85 | 505.90 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/2/03 | 220.54 | 295.04 | 203.79 | 203.00 | 424.33 | 498.04 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/3/03 | 361.50 | 355.45 | 116.66 | 207.11 | 478.16 | 562.56 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/4/03 | 74.33 | 208.16 | 275.47 | 158.15 | 349.80 | 366.31 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/5/03 | 150.18 | 227.54 | 188.89 | 179.11 | 339.07 | 406.65 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/6/03 | 0.00 | 209.64 | 282.16 | 157.28 | 282.16 | 366.92 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/7/03 | 0.00 | 217.56 | 170.23 | 162.14 | 170.23 | 379.70 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/8/03 | 0.00 | 223.28 | 0.00 | 218.00 | 0.00 | 441.28 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/9/03 | 0.04 | 138.39 | 1.10 | 210.48 | 1.14 | 348.87 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/10/03 | 0.00 | 0.00 | 43.96 | 65.35 | 43.96 | 65.35 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/11/03 | 77.05 | 144.31 | 0.00 | 0.00 | 77.05 | 144.31 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/17/03 | 85.93 | 74.40 | 122.96 | 122.13 | 208.89 | 196.53 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/18/03 | 0.00 | 202.92 | 190.25 | 339.31 | 190.25 | 542.23 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/19/03 | 0.00 | 175.41 | 70.24 | 279.01 | 70.24 | 454.42 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/20/03 | 0.02 | 190.71 | 0.00 | 195.64 | 0.02 | 386.35 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/21/03 | 0.59 | 181.61 | 1.28 | 196.70 | 1.87 | 378.31 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/22/03 | 30.40 | 123.14 | 12.13 | 104.78 | 42.53 | 227.92 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/23/03 | 0.00 | 250.58 | 0.18 | 250.35 | 0.18 | 500.93 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/24/03 | 0.00 | 257.72 | 0.00 | 257.67 | 0.00 | 515.39 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/25/03 | 0.00 | 259.37 | 0.00 | 259.28 | 0.00 | 518.65 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/26/03 | 0.00 | 129.05 | 0.00 | 128.98 | 0.00 | 258.03 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/29/03 | 27.37 | 47.40 | 7.39 | 17.39 | 34.76 | 64.79 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/30/03 | 14.88 | 167.09 | 3.51 | 171.85 | 18.39 | 338.94 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/31/03 | 28.02 | 125.32 | 19.00 | 96.72 | 47.02 | 222.04 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| **Variance Limits:** | | | | **Phase I (lb/day)** | **27,513** | **17,770** | | **Total (lb)** | **22,875.18** | **7,237.22** |
| | | | | **Phase II (lb/day)** | **3,345** | **17,770** | | | | |

# APPENDIX 4

# COMMISSIONING VARIANCE MODELING ANALYSIS

## DATA REQUEST 7.

7. Please provide a modeling analysis of the maximum short-term NOx and CO impacts that may occur based on the emission limits being requested in this amendment request. Please provide all input and output files including a description of the meteorological data used in the modeling analysis.

## Data Response 7.

A summary of the requested modeling analysis is provided in the following table. Modeling methodology and a discussion of the meteorological and ozone data sets used in this analysis are provided below. Input, output and meteorological data files are provided on CD-ROM.

**Summary of Modeling Results**
**Maximum Modeled Ambient Concentrations During Commissioning**
**Pastoria Energy Facility**

| Pollutant/ Avg Prd | Max. Modeled Concentration, :g/m$^3$ | Background Concentration, :g/m$^3$ | Total Concentration, :g/m$^3$ | Federal Standard, :g/m$^3$ | State Standard, :g/m$^3$ |
|---|---|---|---|---|---|
| $NO_2$ | | | | | |
| -- one hour | 259 | 165 | 424 | -- | 470 |
| CO | | | | | |
| -- one hour | 3,849 | 18,400 | 22,249 | 40,000 | 23,000 |
| -- eight hours | 940 | 6,670 | 7,610 | 10,000 | 10,000 |

Note: Background concentrations are highest of 2001-2003 readings at the Bakersfield Golden State Hwy monitoring station.

Emission Rates and Stack Parameters

The commissioning modeling assumed that one turbine would be undergoing commissioning and two turbines would be operating at full load. Model inputs are summarized in Attachment AQ-7. Maximum emission rates for the turbine undergoing commissioning were as follows:

NOx: 308 lb/hr (Condition AQ-94)
CO (1-hour average): 2,527 lb/hr (Condition AQ-94)
CO (8-hour average): 1,235 lb/hr (maximum allowable startup emission rate)

Stack parameters for the turbine undergoing commissioning reflect 60 percent load operation (the minimum load for which turbine performance data is available).

Model and Meteorological Data

The modeling analysis was performed using ISCST3; ISC-OLM was used to calculate the maximum 1-hour average $NO_2$ concentration.

Meteorological data was collected at Bakersfield. Several calendar years were evaluated before selecting 1964 met data for this analysis. Before 1964, wind direction was recorded by NWS to every quadrant (22.25 degrees). Using the 1963 Bakersfield met data would have required randomizing wind direction within each 22.5-degree quadrant. In 1964, wind direction was recorded to every 10 degrees for 24 hours per day. After 1964, NWS did not collect data for an eight-hour period each night, so nighttime data are not available for these years. 1964 was used because it provided the most detailed and complete available met data set.

Ozone data for the OLM correction was collected at Arvin in 1996. These data were chosen because they were the most recent available year of ozone from a relatively close location that was also a leap year. The met data and ozone data sets need to have the same number of records; thus the ozone data also had to be from a leap year. Maximum hourly ozone readings in 1992 and 2000 at Arvin were lower than the maximum reading in 1996 (150 and 145 ppb, respectively). Therefore, the 1996 ozone data were also believed to be conservatively high, resulting in higher rather than lower maximum one-hour ozone-limited $NO_2$ concentrations.

Modeling input and output files and meteorological and ozone data files are provided on CD.

PASTORIA ENERGY FACILITY
AMENDMENT REQUEST 2004-0437
DATA RESPONSES
(99-AFC-7C)

# Attachment AQ-7
# Summary of Emission Rates and Stack Parameters

**Pastoria Energy Facility**
**Modeled Impacts During Turbine Commissioning**

| | Stack Diam, m | Stack Height, m | Exh Temp, Deg K | Exhaust Flow, m3/s | Exhaust Velocity, m/s | Emission Rates, g/s | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | NOx | CO 1-hr | CO 8-hr |
| Turbine 1/HRSG | 5.49 | 45.72 | 351.6 | 323.3 | 13.675 | 38.808 | 318.402 | 155.610 |
| Turbine 2/HRSG | 5.49 | 45.72 | 362.3 | 495.8 | 20.971 | 2.146 | 3.140 | 3.140 |
| Turbine 3/HRSG | 5.49 | 45.72 | 362.3 | 495.8 | 20.971 | 2.146 | 3.140 | 3.140 |

| Averaging Period | Pollutant | Modeled Impact, ug/m3 |
|---|---|---|
| 1 hour | NO2 (1) | 259 |
| | CO | 3,849 |
| 8 hour | CO | 940 |

Notes: (1) With ozone limiting.

**Attachment B**

**Copy of**
**District Notice of Public Hearing**
**For Variances**

San Joaquin Valley
Air Pollution Control District

**NOTICE OF PUBLIC HEARING**
**BEFORE THE SOUTHERN REGION HEARING BOARD**
**OF THE SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT**

NOTICE IS HEREBY GIVEN that a public hearing will be held on **October 13, 2004, at 10:00 AM** or as soon thereafter as may be heard. The meeting will be held in the Video Teleconference (VTC) Room of the San Joaquin Valley Unified Air Pollution Control District Southern Region Office with Central Region Office to be included via VTC. The Southern Region Office is located at 2700 "M" Street, Bakersfield, CA, and the Central Region Office is located at 1990 E. Gettysburg Avenue, Fresno, CA.

Said Hearing will be on the proposed petitions from the following company:

| Company Name | Docket # | Rules | Reason for Requested Relief |
|---|---|---|---|
| 1. **Calpine/Pastoria Energy Facility, LLC** 39789 Edmonston Pumping Plant Road Lebec, CA 93243 | S-04-48R | 1081, 2010, 2070.7.0, 2201, 4001, 4101, & 4703 | Regular variance to allow excess NOx, CO, and ammonia slip emissions to occur during Power Block I commissioning. |
| 2. **Calpine/Pastoria Energy Facility, LLC** 39789 Edmonston Pumping Plant Road Lebec, CA 93243 | S-04-49R | 1081, 2010, 2070.7.0, 2201, 4001, 4101, & 4703 | Regular variance to allow excess NOx, CO, and ammonia slip emissions to occur during Power Block II commissioning. |

Said petition will be on file at least thirty days before the hearing. All interested persons may view said documents by contacting the Compliance Division of the Southern Region Office. Any person wishing to submit any data, views, comments, or suggestions concerning the proposed variance petitions for consideration, may do so by submitting the information to the Southern Region Office prior to the hearing.

NOTICE IS FURTHER GIVEN that any interested persons desiring to be heard or present evidence on the above petition is asked to appear in person at the hearing. For additional information, contact the District's Southern Region Office at (661) 326-6900.

Ms. Sissy Smith
Clerk to the Boards
San Joaquin Valley Unified Air Pollution Control District
Dated: September 7, 2004

**Attachment C**

**Post-Certification Amendment**
**Proposed New Conditions of Certification**
**AQ-87 through AQ-89**

**AQ-87** Relief granted by the San Joaquin Valley Unified Air Pollution Control District Hearing Board on October 13, 2004 in Regular Variance Docket No. S-04-48R shall apply to Conditions of Certification AQ-4, AQ-12, AQ-14 through AQ-17, AQ-19, AQ-24, AQ-28 through AQ-30 and AQ-37. The Project Owner shall comply with all requirements and conditions incorporated into this regular variance.

**Verification:** The project owner shall submit copies of all notifications and reports required under this regular variance to the CPM. The project owner shall notify CPM within 5 days of any requested changes to this variance.

**AQ-88** Relief granted by the San Joaquin Valley Unified Air Pollution Control District Hearing Board on October 13, 2004 in Regular Variance Docket No. S-04-49R shall apply to Conditions of Certification AQ-4, AQ-12, AQ-14 through AQ-17, AQ-19, AQ-24, AQ-28 through AQ-30 and AQ-37. The Project Owner shall comply with all requirements and conditions incorporated into this regular variance.

**Verification:** The project owner shall submit copies of all notifications and reports required under this regular variance to the CPM. The project owner shall notify CPM within 5 days of any requested changes to this variance.

**AQ-89** During the commissioning periods of both Power Block I and Power Block II, emission rates from each CTG shall not exceed 308 lbs/hour of NOx and 2,527 lbs/hour of CO, and the combined emission rates from all three CTG's shall not exceed 342 lbs/hour or 4,500 lbs/day of NOx and 2,577 lbs/hour or 12,500 lbs/day of CO.

**Verification:** The project owner shall provide, within 24 hours of occurrence, notification to the CPM of any noncompliance with the commissioning emission limits.

## Attachment D

## Summary of Actual Daily Emissions
## From Sunrise Power Project
## During Commissioning Phases

## Emission Totals (Regular Variance S-02-46R)

| Date | Unit #1 CO (lb/day) | Unit #1 NOX (lb/day) | Unit #2 CO (lb/day) | Unit #2 NOX (lb/day) | Facilitywide CO (lb/day) | Facilitywide NOX (lb/day) | Permit Limits CO (lb/day) | Permit Limits NOX (lb/day) | Excess Emissions CO (lb/day) | Excess Emissions NOX (lb/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Phase I** | | | | | | | | | | |
| 3/16/03 | 198.40 | 170.00 | 0.00 | 0.00 | 198.40 | 170.00 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 3/17/03 | 2,501.10 | 1,113.50 | 3,292.90 | 1,602.30 | 5,794.00 | 2,715.80 | 4,886.8 | 2,341.8 | 907.20 | 374.00 |
| 3/18/03 | 495.10 | 329.40 | 10,314.11 | 3,723.13 | 10,809.21 | 4,052.53 | 4,886.8 | 2,341.8 | 5,922.41 | 1,710.73 |
| 3/19/03 | 6,287.87 | 3,283.61 | 1,745.99 | 648.67 | 8,033.86 | 3,932.28 | 4,886.8 | 2,341.8 | 3,147.06 | 1,590.48 |
| 3/20/03 | 7,470.81 | 829.61 | 294.03 | 87.38 | 7,764.84 | 917.00 | 4,886.8 | 2,341.8 | 2,878.04 | 0.00 |
| 3/21/03 | 1,528.88 | 468.14 | 5,548.17 | 635.24 | 7,077.05 | 1,103.38 | 4,886.8 | 2,341.8 | 2,190.25 | 0.00 |
| 3/22/03 | 5,241.85 | 1,841.31 | 2,817.90 | 1,110.33 | 8,059.75 | 2,951.64 | 4,886.8 | 2,341.8 | 3,172.95 | 609.84 |
| 3/23/03 | 4,691.45 | 1,656.79 | 4,852.63 | 1,617.91 | 9,544.08 | 3,274.70 | 4,886.8 | 2,341.8 | 4,657.28 | 932.90 |
| 3/24/03 | 480.51 | 150.29 | 514.56 | 154.81 | 995.07 | 305.10 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| **Phase II** | | | | | | | | | | |
| 4/19/03 | 39.72 | 8.39 | 0.00 | 0.00 | 39.72 | 8.39 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/20/03 | 72.19 | 235.35 | 0.00 | 0.00 | 72.19 | 235.35 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/21/03 | 43.25 | 1,053.86 | 92.28 | 262.04 | 135.53 | 1,315.90 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/22/03 | 229.89 | 2,886.18 | 0.00 | 0.00 | 229.89 | 2,886.18 | 4,886.8 | 2,341.8 | 0.00 | 544.38 |
| 4/23/03 | 188.29 | 1,862.22 | 0.00 | 0.00 | 188.29 | 1,862.22 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/27/03 | 58.53 | 391.96 | 0.00 | 0.00 | 58.53 | 391.96 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 4/28/03 | 203.18 | 2,815.89 | 54.27 | 370.54 | 257.45 | 3,186.43 | 4,886.8 | 2,341.8 | 0.00 | 844.63 |
| 4/29/03 | 587.88 | 1,895.34 | 140.59 | 707.59 | 728.47 | 2,602.93 | 4,886.8 | 2,341.8 | 0.00 | 261.13 |
| 4/30/03 | 256.07 | 1,308.70 | 214.33 | 1,402.23 | 470.40 | 2,710.93 | 4,886.8 | 2,341.8 | 0.00 | 369.13 |
| 5/1/03 | 274.63 | 285.20 | 215.22 | 220.70 | 489.85 | 505.90 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/2/03 | 220.54 | 295.04 | 203.79 | 203.00 | 424.33 | 498.04 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/3/03 | 361.50 | 355.45 | 116.66 | 207.11 | 478.16 | 562.56 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/4/03 | 74.33 | 208.16 | 275.47 | 158.15 | 349.80 | 366.31 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/5/03 | 150.18 | 227.54 | 188.89 | 179.11 | 339.07 | 406.65 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/6/03 | 0.00 | 209.64 | 282.16 | 157.28 | 282.16 | 366.92 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/7/03 | 0.00 | 217.56 | 170.23 | 162.14 | 170.23 | 379.70 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/8/03 | 0.00 | 223.28 | 0.00 | 218.00 | 0.00 | 441.28 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/9/03 | 0.04 | 138.39 | 1.10 | 210.48 | 1.14 | 348.87 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/10/03 | 0.00 | 0.00 | 43.96 | 65.35 | 43.96 | 65.35 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/11/03 | 77.05 | 144.31 | 0.00 | 0.00 | 77.05 | 144.31 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/17/03 | 85.93 | 74.40 | 122.96 | 122.13 | 208.89 | 196.53 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/18/03 | 0.00 | 202.92 | 190.25 | 339.31 | 190.25 | 542.23 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/19/03 | 0.00 | 175.41 | 70.24 | 279.01 | 70.24 | 454.42 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/20/03 | 0.02 | 190.71 | 0.00 | 195.64 | 0.02 | 386.35 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/21/03 | 0.59 | 181.61 | 1.28 | 196.70 | 1.87 | 378.31 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/22/03 | 30.40 | 123.14 | 12.13 | 104.78 | 42.53 | 227.92 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/23/03 | 0.00 | 250.58 | 0.18 | 250.35 | 0.18 | 500.93 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/24/03 | 0.00 | 257.72 | 0.00 | 257.67 | 0.00 | 515.39 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/25/03 | 0.00 | 259.37 | 0.00 | 259.28 | 0.00 | 518.65 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/26/03 | 0.00 | 129.05 | 0.00 | 128.98 | 0.00 | 258.03 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/29/03 | 27.37 | 47.40 | 7.39 | 17.39 | 34.76 | 64.79 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/30/03 | 14.88 | 167.09 | 3.51 | 171.85 | 18.39 | 338.94 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| 5/31/03 | 28.02 | 125.32 | 19.00 | 96.72 | 47.02 | 222.04 | 4,886.8 | 2,341.8 | 0.00 | 0.00 |
| **Variance Limits:** | | | | **Phase I (lb/day)** | **27,513** | **17,770** | | **Total (lb)** | **22,875.18** | **7,237.22** |
| | | | | **Phase II (lb/day)** | **3,345** | **17,770** | | | | |

## Attachment E

## Summary of Modeling Analysis of Maximum Short-Term NOx and CO Impacts

## DATA REQUEST 7.

7. Please provide a modeling analysis of the maximum short-term NOx and CO impacts that may occur based on the emission limits being requested in this amendment request. Please provide all input and output files including a description of the meteorological data used in the modeling analysis.

## Data Response 7.

A summary of the requested modeling analysis is provided in the following table. Modeling methodology and a discussion of the meteorological and ozone data sets used in this analysis are provided below. Input, output and meteorological data files are provided on CD-ROM.

**Summary of Modeling Results**
**Maximum Modeled Ambient Concentrations During Commissioning**
**Pastoria Energy Facility**

| Pollutant/ Avg Prd | Max. Modeled Concentration, :g/m$^3$ | Background Concentration, :g/m$^3$ | Total Concentration, :g/m$^3$ | Federal Standard, :g/m$^3$ | State Standard, :g/m$^3$ |
|---|---|---|---|---|---|
| $NO_2$ | | | | | |
| -- one hour | 259 | 165 | 424 | -- | 470 |
| CO | | | | | |
| -- one hour | 3,849 | 18,400 | 22,249 | 40,000 | 23,000 |
| -- eight hours | 940 | 6,670 | 7,610 | 10,000 | 10,000 |

Note: Background concentrations are highest of 2001-2003 readings at the Bakersfield Golden State Hwy monitoring station.

Emission Rates and Stack Parameters

The commissioning modeling assumed that one turbine would be undergoing commissioning and two turbines would be operating at full load. Model inputs are summarized in Attachment AQ-7. Maximum emission rates for the turbine undergoing commissioning were as follows:

NOx: 308 lb/hr (Condition AQ-94)
CO (1-hour average): 2,527 lb/hr (Condition AQ-94)
CO (8-hour average): 1,235 lb/hr (maximum allowable startup emission rate)

Stack parameters for the turbine undergoing commissioning reflect 60 percent load operation (the minimum load for which turbine performance data is available).

Model and Meteorological Data

The modeling analysis was performed using ISCST3; ISC-OLM was used to calculate the maximum 1-hour average $NO_2$ concentration.

Meteorological data was collected at Bakersfield. Several calendar years were evaluated before selecting 1964 met data for this analysis. Before 1964, wind direction was recorded by NWS to every quadrant (22.25 degrees). Using the 1963 Bakersfield met data would have required randomizing wind direction within each 22.5-degree quadrant. In 1964, wind direction was recorded to every 10 degrees for 24 hours per day. After 1964, NWS did not collect data for an eight-hour period each night, so nighttime data are not available for these years. 1964 was used because it provided the most detailed and complete available met data set.

Ozone data for the OLM correction was collected at Arvin in 1996. These data were chosen because they were the most recent available year of ozone from a relatively close location that was also a leap year. The met data and ozone data sets need to have the same number of records; thus the ozone data also had to be from a leap year. Maximum hourly ozone readings in 1992 and 2000 at Arvin were lower than the maximum reading in 1996 (150 and 145 ppb, respectively). Therefore, the 1996 ozone data were also believed to be conservatively high, resulting in higher rather than lower maximum one-hour ozone-limited $NO_2$ concentrations.

Modeling input and output files and meteorological and ozone data files are provided on CD.

PASTORIA ENERGY FACILITY
AMENDMENT REQUEST 2004-0437
DATA RESPONSES
(99-AFC-7C)

# Attachment AQ-7
# Summary of Emission Rates and Stack Parameters

**Pastoria Energy Facility**
**Modeled Impacts During Turbine Commissioning**

| | Stack Diam, m | Stack Height, m | Exh Temp, Deg K | Exhaust Flow, m3/s | Exhaust Velocity, m/s | Emission Rates, g/s | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | NOx | CO 1-hr | CO 8-hr |
| Turbine 1/HRSG | 5.49 | 45.72 | 351.6 | 323.3 | 13.675 | 38.808 | 318.402 | 155.610 |
| Turbine 2/HRSG | 5.49 | 45.72 | 362.3 | 495.8 | 20.971 | 2.146 | 3.140 | 3.140 |
| Turbine 3/HRSG | 5.49 | 45.72 | 362.3 | 495.8 | 20.971 | 2.146 | 3.140 | 3.140 |

| Averaging Period | Pollutant | Modeled Impact, ug/m3 |
|---|---|---|
| 1 hour | NO2 (1) | 259 |
| | CO | 3,849 |
| 8 hour | CO | 940 |

Notes: (1) With ozone limiting.