San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

FEB 26 2013

Tim Parcel
Aera Energy LLC
P.O. Box 1164
Bakersfield, CA 93389-1164

Re: Proposed Authorities to Construct / Certificate of Conformity (Minor Mod)
District Facility # C-1121
Project # C-1120160

Dear Mr. Parcel:

Enclosed for your review is the District's analysis of your application for Authorities to Construct for the facility identified above. You have requested that a Certificate of Conformity with the procedural requirements of 40 CFR Part 70 be issued with this project. The modification would increase the waste gas flow rate for the steam generator and the flare and lower the NOx emission rate for the steam generators.

After addressing any EPA comments made during the 45-day comment period, the Authorities to Construct will be issued to the facility with a Certificate of Conformity. Prior to operating with modifications authorized by the Authorities to Construct, the facility must submit an application to modify the Title V permit as an administrative amendment, in accordance with District Rule 2520, Section 11.5.

If you have any questions, please contact Mr. Jim Swaney, Permit Services Manager, at (559) 230-5900.

Thank you for your cooperation in this matter.

Sincerely,

David Warner
Director of Permit Services

Enclosures
cc: G. Heinen, Permit Services

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
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FEB 26 2013

Gerardo C. Rios, Chief
Permits Office
Air Division
U.S. EPA - Region IX
75 Hawthorne St
San Francisco, CA 94105

Re: **Proposed Authorities to Construct / Certificate of Conformity (Minor Mod)**
District Facility # C-1121
Project # C-1120160

Dear Mr. Rios:

Enclosed for your review is the District's engineering evaluation of an application for Authorities to Construct for Aera Energy LLC, located at the Coalinga Oilfield, which has been issued a Title V permit. Aera Energy LLC is requesting that a Certificate of Conformity, with the procedural requirements of 40 CFR Part 70, be issued with this project. The modification would increase the waste gas flow rate for the steam generator and the flare and lower the NOx emission rate for the steam generators.

Enclosed is the engineering evaluation of this application, a copy of the current Title V permit, and proposed Authorities to Construct # C-1121-17-26, '-18-26, '-19-26, '-41-26, and '-168-11 with Certificate of Conformity. After demonstrating compliance with the Authorities to Construct, the conditions will be incorporated into the facility's Title V permit through an administrative amendment.

Please submit your written comments on this project within the 45-day comment period that begins on the date you receive this letter. If you have any questions, please contact Mr. Jim Swaney, Permit Services Manager, at (559) 230-5900.

Thank you for your cooperation in this matter.

Sincerely,

David Warner
Director of Permit Services

Enclosures
cc: G. Heinen, Permit Services

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Authority to Construct
Application Review
Steam Generators and Flare Fuel Input Limits

Facility Name:	Aera Energy LLC	Date:	January 14, 2013
Mailing Address:	P.O. Box 11164 Bakersfield, CA 93389-1164	Engineer:	G. Heinen
		Lead Engineer:	Brian Clements
Contact Person:	Tim Parcel		
Telephone:	(559) 935-7418		
Application #:	C-1121-17-26, -18-26, -19-26, -41-26, -168-11		
Project #:	C-1120160		
Complete:	April 24, 2012		

I. Proposal

Aera Energy LLC has requested Authorities to Construct (ATCs) to modify four existing steam generators and one flare to change the Specific Limiting Condition (SLC) for the well casing vapor recovery gas daily limit from 675,000 scf/day to 1,300,000 scf/day. The steam generators are currently permitted under Permits to Operate (PTO) C-1121-17-18, -18-18, -19-18, and -41-18 and the flare as C-1121-168-8 (Appendix A).

According to a March 28, 2012 letter from the applicant, they have implemented previously issued ATC C-1121-17-24, -18-24, -19-24, -41-24, and -168-10, which contain the SLC for the 675,000 scf/day (Appendix A). Compliance staff have verified the information and initiated proper action to convert the ATCs. The applicant's letter stated that the remaining, unimplemented ATCs would be cancelled.

According to an August 14, 2012 email, the NOx limits for the steam generators will be reduced from 15 ppmv to 14 ppmv, as part of this project. Finally, since the analysis will assume the changes are implemented on each of the project units, it will be necessary to implement all of the proposed changed simultaneously to assure compliance with this evaluation.

To ensure compliance, the following condition will be placed onto the indicated ATCs:

ATC C-1121-17-26:

- ATC C-1121-17-25 shall be canceled upon implementation of this ATC. [District Rule 2201]
- This ATC shall be implemented concurrent with ATCs C-1121-18-26, -19-26, -41-26, and -168-11 [District Rule 2201]

ATC C-1121-18-26:

- ATC C-1121-18-25 shall be canceled upon implementation of this ATC. [District Rule 2201]
- This ATC shall be implemented concurrent with ATCs C-1121-17-26, -19-26, -41-26, and -168-11 [District Rule 2201]

ATC C-1121-19-26:

- ATC C-1121-19-25 shall be canceled upon implementation of this ATC. [District Rule 2201]
- This ATC shall be implemented concurrent with ATCs C-1121-17-26, -18-26, -41-26, and -168-11 [District Rule 2201]

ATC C-1121-41-26:

- ATC C-1121-41-25 shall be canceled upon implementation of this ATC. [District Rule 2201]
- This ATC shall be implemented concurrent with ATCs C-1121-17-26, -18-26, -19-26, and -168-11 [District Rule 2201]

ATC C-1121-168-11:

- This ATC shall be implemented concurrent with ATCs C-1121-17-26, -18-26, -19-26, and -41-26. [District Rule 2201]

Aera Energy received their Title V Permit on November 29, 2001. This modification can be classified as a Title V minor modification pursuant to Rule 2520, Section 3.20, and can be processed with a Certificate of Conformity (COC). Since the facility has specifically requested that this project be processed in that manner, the 45-day EPA comment period will be satisfied prior to the issuance of the Authority to Construct. Aera Energy must apply to administratively amend their Title V Operating Permit to include the requirements of the ATCs issued with this project.

II. Applicable Rules

Rule 2010 Permits Required (12/17/92)
Rule 2201 New and Modified Stationary Source Review Rule (04/21/11)
Rule 2520 Federally Mandated Operating Permits (6/21/01)
Rule 4001 New Source Performance Standards, Subparts A and D (4/14/99)
Rule 4101 Visible Emissions (02/17/05)
Rule 4102 Nuisance (12/17/92)
Rule 4201 Particulate Matter Concentration (12/17/92)
Rule 4301 Fuel Burning Equipment (12/17/92)
Rule 4305 Boilers, Steam Generators, and Process Heaters – Phase 2 (08/21/03)
Rule 4306 Boilers, Steam Generators, and Process Heaters – Phase 3 (10/16/08)
Rule 4311 Flares (6/08/09)
Rule 4230 Advanced Emission Reduction Options for Boilers, Steam Generators and Process Heaters, Greater than 5.0 MMBtu/hr (10/16/08)
Rule 4351 Boilers, Steam Generators, and Process Heaters – Phase 1 (09/21/03)
Rule 4401 Steam-Enhanced Crude Oil Production Well Vents (06/16/11)
Rule 4801 Sulfur Compounds (12/17/92)

CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notice
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The equipment will be located in the Coalinga Heavy Oil Field, within Section 26, Township 19S, Range 15E. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

The steam generators involved in this project are fired on PUC-quality natural gas or a combination of PUC-quality natural gas and well casing vapor recovery gas. High-pressure steam produced by these units is continuously injected into a reservoir, near the base of the oil zone, through steam injection wells arranged in geometric patterns near the production wells. The process, known as steam drive, forms a steam-saturated zone in the oil reservoir. As the steam-saturated zone expands, steam distillation of the oil occurs. The temperature of the steam declines as it moves away from the injection well, and an advancing hot-water zone is formed. The advancing hot water and steam-saturated zones increase the mobility of the oil by decreasing its viscosity. The steam also thermally expands the oil and pushes it to the production wells.

Gasses are also produced as a result of the steaming process, and include water vapor, CO_2, CO, H_2S, and hydrocarbons. These gasses are vented from the well casings to a vapor collection and control system. The well vent vapor control system is designed to collect all of the vapors from the wellhead casing vents, which are connected to the system vapors. The collection system prior to the compressors is maintained at a slight vacuum or very low pressure. The associated gas/liquid separators and air-cooled heat exchangers are designed to remove liquids for further processing in the oil treatment plants. Incondensable vapors are incinerated in steam generators permitted to burn vapor recovery gas.

This flare, which is currently classified as a dormant emissions unit, was permitted for operation up to 48 hours in a quarter (192 hours/year) to incinerate the vapor recovery gas that normally is incinerated by the four steam generators involved in this project when they are all shut down for maintenance.

The proposed operating schedule of the steam generators is 24 hr/day, 7 days/week, and 52 weeks/year.

V. Equipment Listing

Pre-Project Equipment Description: As discussed above, the ATCs for this project will contain conditions requiring the implementation of specified ATCs, therefore the equipment description from those ATCs will be considered the pre-project equipment listing.

C-1121-17-24: MODIFICATION OF SG S-9, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH COEN QLN ULN BURNER AND FLUE GAS RECIRCULATION SERVED BY LO-COST H2S SCAVENGER SYSTEM SHARED WITH PERMIT UNITS C-1121-18, '-19 AND '-41: INSTALL SULFATREAT VESSELS DOWNSTREAM OF LO-COST SCAVENGING SYSTEM FOR H2S REMOVAL AND LIMIT EXHAUST SOX EMISSIONS TO 9 PPMV @3% O2 FOR RULE 4320 COMPLIANCE

C-1121-18-24: MODIFICATION OF SG S-10, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER, AND A FLUE GAS RECIRCULATION (FGR) SYSTEM SERVED BY LO-COST H2S SCAVENGER SYSTEM SHARED WITH PERMIT UNITS C-1121-17, '-19 AND '-41: INSTALL SULFATREAT VESSELS DOWNSTREAM OF LO-COST SCAVENGING SYSTEM FOR H2S REMOVAL AND LIMIT EXHAUST SOX EMISSIONS TO 9 PPMV @3% O2 FOR RULE 4320 COMPLIANCE

C-1121-19-24: MODIFICATION OF SG S-11, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER AND A FLUE GAS RECIRCULATION (FGR) SYSTEM SERVED BY LO-COST H2S SCAVENGER SYSTEM SHARED WITH PERMIT UNITS C-1121-17, '-18 AND '-41: INSTALL SULFATREAT VESSELS DOWNSTREAM OF LO-COST SCAVENGING SYSTEM FOR H2S REMOVAL AND LIMIT EXHAUST SOX EMISSIONS TO 9 PPMV @ 3% O2 FOR RULE 4320 COMPLIANCE

C-1121-41-24: MODIFICATION OF 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR (S-12) WITH COEN QLN-ULN BURNER, FLUE GAS RECIRCULATION SERVED BY LO-COST H2S SCAVENGER SYSTEM SHARED WITH PERMIT UNITS C-1121-17, '-18 AND '-19: INSTALL SULFATREAT VESSELS DOWNSTREAM OF LO-COST SCAVENGING SYSTEM FOR H2S REMOVAL AND LIMIT EXHAUST SOX EMISSIONS TO 9 PPMV @ 3% O2 FOR RULE 4320 COMPLIANCE

C-1121-168-10: MODIFICATION OF DORMANT 7.16 MMBTU/HR FLARE WITH H2S SCAVENGER SYSTEM TO BE USED TO INCINERATE NATURAL, WELL CASING, AND VAPOR RECOVERY GAS DURING MAINTENANCE OF FOUR 62.5 MMBTU/HR STEAM GENERATORS (C-1121-17, -18, -19, AND -41): LOWER ANNUAL SOX LIMIT SHARED WITH STEAM GENERATORS C-1121-17, -18, -19, AND -41 TO 28,580 LB/YR

Proposed Modification:

C-1121-17-26: MODIFICATION OF S-9, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH COEN QLN ULN BURNER AND FLUE GAS RECIRCULATION SERVED BY LO-COST H2S SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C-1121-18, '-19 AND '-41: INCREASE THE VAPOR RECOVERY GAS LIMIT FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY AND LIMIT NOX EMISSIONS TO 14 PPMV @ 3% O2

C-1121-18-26: MODIFICATION OF S-10, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER, AND A FLUE GAS RECIRCULATION (FOR) SYSTEM SERVED BY LO-COST H2S SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C-1121-17, '-19 AND '-41: INCREASE THE VAPOR RECOVERY GAS LIMIT FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY AND LIMIT NOX EMISSIONS TO 14 PPMV @ 3% O2

C-1121-19-26: MODIFICATION OF S-11, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER AND A FLUE GAS RECIRCULATION (FGR) SYSTEM SERVED BY LO-COST H2S . SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C-1121-17, '-18 AND '-41: INCREASE THE VAPOR RECOVERY GAS LIMIT FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY AND LIMIT NOX EMISSIONS TO 14 PPMV @ 3% O2

C-1121-41-26: MODIFICATION OF S-12, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR (S-12) WITH COEN QLN-ULN BURNER, FLUE GAS RECIRCULATION SERVED BY LO-COST H2S SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C- 1121-17, '-18 AND '-19: INCREASE THE VAPOR RECOVERY GAS LIMIT FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY AND LIMIT NOX EMISSIONS TO 14 PPMV @ 3% O2

C-1121-168-11: MODIFICATION OF 7.16 MMBTU/HR FLARE TO BE USED TO INCINERATE NATURAL, WELL CASING, AND VAPOR RECOVERY GAS DURING MAINTENANCE OF FOUR 62.5 MMBTU/HR STEAM GENERATORS (C-1121-17, -18, -19, AND -41): INCREASE THE VAPOR RECOVERY GAS LIMIT FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY

Post Project Equipment Description:

C-1121-17-26: S-9, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH COEN QLN ULN BURNER AND FLUE GAS RECIRCULATION SERVED BY LO-COST H2S SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C-1121-18, '-19 AND '-41

C-1121-18-26: S-10, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER, AND A FLUE GAS RECIRCULATION (FOR) SYSTEM SERVED BY LO-COST H2S SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C-1121-17, '-19 AND '-41

C-1121-19-26: S-11, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER AND A FLUE GAS RECIRCULATION (FGR) SYSTEM SERVED BY LO-COST H2S . SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C-1121-17, '-18 AND '-41

C-1121-41-26: S-12, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR (S-12) WITH COEN QLN-ULN BURNER, FLUE GAS RECIRCULATION SERVED BY LO-COST H2S SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C- 1121-17, '-18 AND '-19

C-1121-168-11: 7.16 MMBTU/HR FLARE TO BE USED TO INCINERATE NATURAL, WELL CASING, AND VAPOR RECOVERY GAS DURING MAINTENANCE OF FOUR 62.5 MMBTU/HR STEAM GENERATORS (C-1121-17, -18, -19, AND -41)

VI. Emission Control Technology Evaluation

The emission control devices/technologies and their effect on the steam generators and flare emissions are detailed below.

Nitrogen oxides are the primary air contaminants produced when burning natural gas. They are formed either by thermal fixation of nitrogen in the air (thermal NO_X) or by the conversion of chemically bound nitrogen in the fuel (fuel NO_X). Because natural gas has characteristically low nitrogen content, nearly all NO_X emissions from natural gas combustion are thermal NO_X. For internal combustion using natural gas fuel, the formation of NO_X emissions is primarily dependent on the factors of peak temperature within the combustion chamber, fuel nitrogen concentration, combustion-zone oxygen concentration, and time of exposure at peak temperatures.

In general, manufacturers' specifications of a steam generator indicate that the use of low NO_X burners and external flue gas recirculation (FGR), operated at a minimum FGR rate of

15% during normal operation, is expected to reduce NO_X emissions to no more than 30 ppmv at 3% O_2. Air and fuel are pre-mixed, prior to injection into the low NO_X burner. This better mixing of air and fuel prior to combustion creates a stable flame, thus minimizing the formation of hot spots in the combustion zone. Fewer hot spots will reduce the formation of thermal NO_X. FGR recycles a portion of the exhaust stream into the burner wind-box, mixing low O_2 air with combustion air prior to entering the combustion chamber. FGR reduces the concentration of oxygen available in the combustion-zone and increases the air mass to be heated while staged combustion burner design extends the combustion process. The overall result is a cooler flame. Therefore, peak flame temperature is reduced and the amount of thermal NO_X associated with elevated combustion temperature is also reduced.

The flare is used as to control emissions of vapor recovery gas in the event that the steam generators are not operating. The flare tip is equipped to ensure that a flame is present at all time when gases are being vented through it, to ensure all gases are combusted and not released into the atmosphere. The flare fuel limits are set to ensure that emissions from the flare will be less than the combined emissions from the four steam generators.

In order to control SO_X emissions, a H_2S Scavenger System is used on the incoming vapor recovery gas. This lowers SO_X emissions by lowering the H_2S content of the vapor recovery gas. This is accomplished with a polar bond between the H_2S and the scrubber media. Once the H_2S is collected with the scrubber media, it can be recovered at the sulfur recovery plant.

VII. General Calculations

A. Assumptions

- Operating schedule for the steam generators: 24 hours/day, 365 days/year.
- The flare will only operate when all of the steam generators are not operating, and will be limited to not exceed 48 hours per calendar quarter or 192 hours per calendar year.
- Heat Content of Natural Gas = 0.001 MMBtu/scf
- Heat Content of Vapor Recovery Gas = 0.0001 MMBtu/scf (per applicant)
- F Factor = 8,578 dscf/MMBtu at 60 °F and 1 atm
- Molar Volume = 375.87 ft^3/lb-mol at 60 °F and 1 atm
- The exhaust gas flow from each generator is calculated as follows

$$\frac{8578\,dscf}{1MMBtu} x \frac{62.5\,MMBTU}{HR} x \frac{1\,hr}{60\,Min} x \frac{20.9}{20.9-3.0} = 10{,}433\,dscfm\ @\ 3\%O2$$

- Pre-project combined fuel throughput of the flare is limited to 1.3 MMscf/day.
- Pre-project total vapor recovery gas usage = 675,000 scf/day for all 4 steam generators
- Pre-project combined heat input = 1,500 MMBtu/day, per each steam generator.
- Pre-project daily SOx emissions are limited to 9 ppmv @ 3% oxygen for District Rule 4320 compliance and 22.8 lb/day per each steam generator.
- Pre-project annual SOx emissions limited to 28,580 lb/yr for all five units in the SLC.
- Post -project combined fuel throughput of the flare is limited to 1.3 MMscf/day.
- Post-project total vapor recovery gas usage = 1,300,000 scf/day for all 4 steam generators.
- Post-project combined heat input = 1,500 MMBtu/day, per each steam generator.

- Post-project daily SOx emissions are limited to 9 ppmv @ 3% oxygen for District Rule 4320 compliance and 22.8 lb/day per each steam generator.
- Post-project annual SOx emissions limited to 28,580 lb/yr for all five units in the SLC.

B. Emission Factors

The pre-project emission factors are taken from the previously referenced ATCs, which will be implemented prior to implementing this project.

Pre-Project Emission Factors (lb/MMBtu)					
Pollutant	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
SG Natural Gas	0.018	0.00285	0.0076	0.032	0.008
SG Recovery Gas	0.018	0.015[1]	0.0076	0.032	0.008
Flare Natural Gas	0.068	0.00285	0.008	0.37	0.063
Flare Recovery Gas	0.068	3.32[2]	0.633	0.37	0.063

[1] This factor was originally derived from the permit condition limiting exhaust SOx emissions 9 ppmv @ 3% oxygen for District Rule 4320 compliance and does not necessarily represent the actual instantaneous emission factor from burning vapor recovery gas. The EF_{SOx} was previously calculated as follows:

$$\text{lb-SOx/day} = \frac{9.0}{1\ \text{million}} \times \frac{64.06\ \text{lb SOx}}{\text{lb-mol}} \times \frac{\text{lb-mol}}{379\ \text{scf}} \times \frac{10{,}433\ \text{dscf}}{\text{min}} \times \frac{60\ \text{min}}{\text{hr}}$$

$$= 0.952\ \text{lb SOx/hr}$$

$$EF_{SOx} = 0.952\ \text{lb SOx/hr} \ / \ 62.5\ \text{MMBtu/hr}$$
$$= 0.015\ \text{lb SOx/MMBtu}$$

[2] This factor was derived using the Mass Balance equation, as shown in Appendix C. The permit condition actually allows 8.44 lb/MMBtu, based on an earlier calculation of this factor. That value was originally carried over to a subsequent permit, but the value of 3.32 lb SOx/ MMBtu appears to be the most accurate.

The post-project emission factors, except for NOx and SOx, are the same as the pre-project emission factors since there are no physical changes to the equipment. The applicant proposes to increase the rate of sulfur removal to compensate for the proposed increase use of vapor recovery gas. The post-project SOx emission factor for the flare was derived in Appendix C.

Post-Project Emission Factors (lb/MMBtu)					
Pollutant	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
SG Natural Gas	0.017	0.00285	0.0076	0.032	0.008
SG Recovery Gas	0.017	0.015	0.0076	0.032	0.008
Flare Natural Gas	0.068	0.00285	0.008	0.37	0.063
Flare Recovery Gas	0.068	3.31	0.008	0.37	0.063

C. Calculations

1. Pre-Project Potential to Emit (PE1)

a. Steam Generators (-17, -18, -19, -41)

The daily emissions for the steam generators are calculated as the EF times the amount of gas burned. Since the EF is in lb/MMBtu and the vapor recovery gas usage is measured in MMscf, the EF will be converted to lb/MMscf by multiplying by the heating value of the gas. The two extreme scenarios for any one steam generator are:

- Scenario 1: Routing the currently permitted maximum vapor recovery gas allowable in a day (675,000 scf/day) through the steam generator and run the remaining allowable fuel limit (1,500 MMBtu/day), as natural gas, through the steam generator. The remaining natural gas amount is calculated as

  (1,500 MMBtu – (675,000 scf x 0.0001 MMBtu/scf)) = 1,432.5 MMBtu

- Scenario 2: Using only natural gas (1,500 MMBtu/day) in the steam generator.

Scenario 1: The following tables calculate the emissions for both scenarios and pick the larger emissions of either scenario for each pollutant. Since the emission factors for NOx, PM10, CO, and VOC are the same for both fuel types, there is no need to separate the calculations for each of the fuels.

Pre-Project Steam Generator Daily Emissions (Vapor Recovery Gas + Limited Natural Gas)							
NO_x	0.018	(lb/MMBtu) x	1,500	(MMBtu)	=	27.0	(lb/day)
SO_x		Limit based on 9 ppmv limit			=	22.8	(lb/day)
PM_{10}	0.0076	(lb/MMBtu) x	1,500	(MMBtu)	=	11.4	(lb/day)
CO	0.032	(lb/MMBtu) x	1,500	(MMBtu)	=	48.0	(lb/day)
VOC	0.008	(lb/MMBtu) x	1,500	(MMBtu)	=	12.0	(lb/day)

Scenario 2: Using the natural gas combustion emission factors, the following emissions are calculated:

Pre-Project Steam Generator Daily Emissions (Natural Gas Only)							
NO_x	0.018	(lb/MMBtu) x	1500	(MMBtu)	=	27.0	(lb/day)
SO_x	0.00285	(lb/MMBtu) x	1500	(MMBtu)	=	4.3	(lb/day)
PM_{10}	0.0076	(lb/MMBtu) x	1500	(MMBtu)	=	11.4	(lb/day)
CO	0.032	(lb/MMBtu) x	1500	(MMBtu)	=	48.0	(lb/day)
VOC	0.008	(lb/MMBtu) x	1500	(MMBtu)	=	12.0	(lb/day)

As shown above, except for SOx, the daily PE for a steam generator is the same, regardless of the type or mix of fuel burned. The maximum SOx PE occurs when the two fuels are burned simultaneously. The PE1 is shown in the following table:

Pre-Project Daily Emissions (Steam Generator)					
Pollutant	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
lb/day	27.0	22.8	11.4	48.0	12.0

The quarterly Pre-Project PE is the Daily PE times 91 days/quarter.

Pre-Project Quarterly Emissions (Steam Generator)					
Pollutant	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
lb/qtr	2,457	2,075	1,037	4,368	1,092

The annual Pre-Project PE is the Daily PE times 365 days/year.

Pre-Project Annual Emissions (Steam Generator)							
NO_x	27.0	(lb/day)	x	365 day/yr	=	**9,855**	(lb/year)
SO_x	22.8	(lb/day)	x	365 day/yr	=	**8,322**	(lb/year)
PM_{10}	11.4	(lb/day)	x	365 day/yr	=	**4,161**	(lb/year)
CO	48.0	(lb/day)	x	365 day/yr	=	**17,520**	(lb/year)
VOC	12.0	(lb/day)	x	365 day/yr	=	**4,380**	(lb/year)

The annual Pre-Project PE from the combined units is their Annual PE times four.

Pre-Project Annual Emissions (all Steam Generators combined)							
NO_x	9,855	(lb/year/unit)	x	4	units =	**39,420**	(lb/year)
SO_x	An SLC limits Annual SOx emissions to 28,580 lb/year.						
PM_{10}	4,161	(lb/year/unit)	x	4	units =	**16,644**	(lb/year)
CO	17,520	(lb/year/unit)	x	4	units =	**70,080**	(lb/year)
VOC	4,380	(lb/year/unit)	x	4	units =	**17,520**	(lb/year)

b. Flare (-168)

The daily emissions for the flare are calculated as the EF times the amount of gas burned. Since the EF is in lb/MMBtu and the vapor recovery gas usage is measured in MMscf, the EF will be converted to lb/MMscf by multiplying by the heating value of the gas. The operational scenario for the flare is:

- Running currently permitted maximum vapor recovery gas allowable in a day (675,000 scf/day) through the flare and running the remaining allowable fuel limit (0.675 MMBtu/day), as natural gas, through the flare. The remaining natural gas amount is calculated as

  (1.35 MMscf – 0.675 MMscf) = 0.675 MMscf

Unlike the steam generators, there is no reason to fire the flare solely on natural gas. It acts as a control for the vapor recovery gas emissions and some natural gas may

be required as a supplemental fuel to sustain combustion, but firing it purely on natural gas would not serve a beneficial purpose so it will not be analyzed.

The following tables calculate the flare's emissions, assuming the mix of vapor recovery gas plus natural gas as a supplemental fuel.

Pre-Project Flare Daily Emissions (Vapor Recovery Gas)										
NO_x	0.068	(lb/MMBtu) x	100	(Btu/scf) x	.675	(MMscf/day) =	4.6	(lb/day)
SO_x	3.32	(lb/MMBtu) x	100	(Btu/scf) x	.675	(MMscf/day) =	224.1	(lb/day)
PM_{10}	0.008	(lb/MMBtu) x	100	(Btu/scf) x	.675	(MMscf/day) =	0.5	(lb/day)
CO	0.37	(lb/MMBtu) x	100	(Btu/scf) x	.675	(MMscf/day) =	25.0	(lb/day)
VOC	0.063	(lb/MMBtu) x	100	(Btu/scf) x	.675	(MMscf/day) =	4.3	(lb/day)

Pre-Project Flare Daily Emissions (Natural Gas, as a supplemental fuel)										
NO_x	0.068	(lb/MMBtu) x	1000	(Btu/scf) x	.675	(MMscf/day) =	45.9	(lb/day)
SO_x	0.00285	(lb/MMBtu) x	1000	(Btu/scf) x	.675	(MMscf/day) =	1.9	(lb/day)
PM_{10}	0.008	(lb/MMBtu) x	1000	(Btu/scf) x	.675	(MMscf/day) =	5.4	(lb/day)
CO	0.37	(lb/MMBtu) x	1000	(Btu/scf) x	.675	(MMscf/day) =	249.8	(lb/day)
VOC	0.063	(lb/MMBtu) x	1000	(Btu/scf) x	.675	(MMscf/day) =	42.5	(lb/day)

Pre-Project Flare Daily Emissions (Vapor Recovery Gas and Natural Gas)							
NO_x	4.6	(lb/day)	+	45.9	(lb/day)	=	**50.5** (lb/day)
SO_x	224.1	(lb/day)	+	1.9	(lb/day)	=	**226.0** (lb/day)
PM_{10}	0.5	(lb/day)	+	5.4	(lb/day)	=	**5.9** (lb/day)
CO	25.0	(lb/day)	+	249.8	(lb/day)	=	**274.8** (lb/day)
VOC	4.3	(lb/day)	+	42.5	(lb/day)	=	**46.8** (lb/day)

Since the flare is limited by permit condition to not exceed 48 hours per calendar quarter (2 days/qtr) and not to exceed 192 hours per calendar year (8 days/year), quarterly emissions will be calculated as simply two times the daily emissions and are shown below:

Pre-Project Quarterly Emissions (Flare)					
Pollutant	NOx	SOx	PM_{10}	CO	VOC
lb/qtr	101	452	12	550	94

The annual emissions are based on the flare running the eight day/year, calculated as eight time the daily emissions, as shown below:

Pre-Project Annual Emissions (Flare)					
Pollutant	NOx	SOx	PM_{10}	CO	VOC
lb/year	404	1,808	48	2,198	374

2. Post-Project PE (PE2)

a. Steam Generators (-17, -18, -19, -41)

The daily emissions for the steam generators are calculated as the EF times the amount of gas burned. Since the EF is in lb/MMBtu and the vapor recovery gas usage is measured in MMscf, the EF will be converted to lb/MMscf by multiplying by the heating value of the gas. The two extreme scenarios for any one steam generator are:

- Scenario 1: Route all the proposed, increased limit of vapor recovery gas (1.3 MMscf/day) through a steam generator and run the remaining allowable fuel limit (1,370 MMBtu/day), as natural gas, through the steam generator. The remaining natural gas amount is calculated as

  (1,500 MMBtu/day – (1.3 MMscf/day x 100 Btu/scf)) = 1,370 MMBtu/day

- Scenario 2: Using only natural gas (1,500 MMBtu/day) in the steam generator.

Scenario 1: The following tables calculate the emissions for both scenarios and pick the larger emissions of either scenario for each pollutant. Since the emission factors for NOx, PM10, CO, and VOC are the same for both fuel types, there is no need to separate the calculations for each of the fuels.

Post-Project Steam Generator Daily Emissions (Vapor Recovery Gas + Limited Natural Gas)							
NO_x	0.017	(lb/MMBtu) x	1,500	(MMBtu)	=	25.5	(lb/day)
SO_x		Limit based on 9 ppmv limit			=	22.8	(lb/day)
PM_{10}	0.0076	(lb/MMBtu) x	1,500	(MMBtu)	=	11.4	(lb/day)
CO	0.032	(lb/MMBtu) x	1,500	(MMBtu)	=	48.0	(lb/day)
VOC	0.008	(lb/MMBtu) x	1,500	(MMBtu)	=	12.0	(lb/day)

Scenario 2: Using the natural gas combustion emission factors, the following emissions are calculated:

Post-Project Steam Generator Daily Emissions (Natural Gas Only)							
NO_x	0.017	(lb/MMBtu) x	1500	(MMBtu)	=	25.5	(lb/day)
SO_x	0.00285	(lb/MMBtu) x	1500	(MMBtu)	=	4.3	(lb/day)
PM_{10}	0.0076	(lb/MMBtu) x	1500	(MMBtu)	=	11.4	(lb/day)
CO	0.032	(lb/MMBtu) x	1500	(MMBtu)	=	48.0	(lb/day)
VOC	0.008	(lb/MMBtu) x	1500	(MMBtu)	=	12.0	(lb/day)

As shown above, except for SOx, the daily PE for a steam generator is the same, regardless of the type or mix of fuel burned. The maximum SOx PE occurs when the two fuels are burned simultaneously. The PE2 is shown in the following table:

Post-Project Daily Emissions (Steam Generator)					
Pollutant	NOx	SOx	PM_{10}	CO	VOC
lb/day	25.5	22.8	11.4	48.0	12.0

The quarterly PE is the Daily PE times 91 days.

Post-Project Quarterly Emissions (Steam Generator)					
Pollutant	NOx	SOx	PM_{10}	CO	VOC
lb/qtr	2321	2,075	1,037	4,369	1,092

The annual Post-Project PE is the Daily PE times 365 days/year.

Post-Project Annual Emissions (Steam Generator)							
NO_x	**25.5**	(lb/day)	x	365 day/yr	=	**9,308**	(lb/year)
SO_x	**22.8**	(lb/day)	x	365 day/yr	=	**8,322**	(lb/year)
PM_{10}	**11.4**	(lb/day)	x	365 day/yr	=	**4,161**	(lb/year)
CO	**48.0**	(lb/day)	x	365 day/yr	=	**17,520**	(lb/year)
VOC	**12.0**	(lb/day)	x	365 day/yr	=	**4,380**	(lb/year)

The annual Post-Project PE from the combined units is their Annual PE times four.

Post-Project Annual Emissions (all Steam Generators combined)							
NO_x	9,308	(lb/year/unit)	x	4	units =	**37,232**	(lb/year)
SO_x	An SLC limits Annual SOx emissions to 28,580 lb/year.						
PM_{10}	4,161	(lb/year/unit)	x	4	units =	**16,644**	(lb/year)
CO	17,520	(lb/year/unit)	x	4	units =	**70,080**	(lb/year)
VOC	4,380	(lb/year/unit)	x	4	units =	**17,520**	(lb/year)

b. Flare (-168)

The daily emissions for the flare are calculated as the EF times the amount of gas burned. Since the EF is in lb/MMBtu and the vapor recovery gas usage is measured in MMscf, the EF will be converted to lb/MMscf by multiplying by the heating value of the gas. The operational scenario for the flare is:

- Running all the proposed, increased limit of vapor recovery gas (1.3 MMscf/day) through the flare. Under this scenario, there would be no remaining supplemental natural gas through the flare. The operator verified that this was their intended worst case operation and did not want to increase the daily combined fuel limit to the flare. The remaining supplemental natural gas amount was calculated as

  (1.35 MMscf – 1.35 MMscf) = 0.0 MMscf of natural gas

- As before, unlike the steam generators, there is no reason to fire the flare solely on natural gas. It acts as a control for the vapor recovery gas emissions and some natural gas may be required to sustain combustion, but firing it purely on natural gas would not serve a beneficial purpose, so it will not be analyzed.

- It is possible that the flare may be fired on a combination of both vapor recovery gas and natural gas as a supplemental fuel. A 50% vapor recovery gas and 50% natural gas mixture shall be assumed since that was the scenario assumed under the pre-project emission calculations.

The following tables calculate the emissions for worst case scenario of firing entirely on vapor recovery gas.

Post-Project Flare Daily Emissions (Vapor Recovery Gas)								
NO_x	0.068	(lb/MMBtu) x	100	(Btu/scf) x	1.3	(MMscf/day) =	**8.8**	(lb/day)
SO_x	3.31	(lb/MMBtu) x	100	(Btu/scf) x	1.3	(MMscf/day) =	**430.3**	(lb/day)
PM_{10}	0.008	(lb/MMBtu) x	100	(Btu/scf) x	1.3	(MMscf/day) =	**1.0**	(lb/day)
CO	0.37	(lb/MMBtu) x	100	(Btu/scf) x	1.3	(MMscf/day) =	**48.1**	(lb/day)
VOC	0.063	(lb/MMBtu) x	100	(Btu/scf) x	1.3	(MMscf/day) =	**8.2**	(lb/day)

The calculations for the 50% vapor recovery gas and 50% natural gas mixture is identical to the pre-project calculations so only the results will be presented and are shown in the following table:

Post-Project Flare Daily Emissions (Vapor Recovery Gas and Natural Gas Mix)								
NO_x	4.6	(lb/day)	+	45.9	(lb/day)	=	**50.5**	(lb/day)
SO_x	224.1	(lb/day)	+	1.9	(lb/day)	=	**226.0**	(lb/day)
PM_{10}	0.5	(lb/day)	+	5.4	(lb/day)	=	**5.9**	(lb/day)
CO	25.0	(lb/day)	+	249.8	(lb/day)	=	**274.8**	(lb/day)
VOC	4.3	(lb/day)	+	42.5	(lb/day)	=	**46.8**	(lb/day)

The maximum daily flare emissions will depend on the amount of vapor recover gas and natural gas burned so the highest of the the two scenario values will be used:

Post-Project Maximum Emissions (Flare)					
Pollutant	NOx	SOx	PM_{10}	CO	VOC
lb/day	**50.5**	**430.3**	**5.9**	**274.8**	**46.8**

Since the flare is limited by permit condition to not exceed 48 hours per calendar quarter (2 days/qtr) and not to exceed 192 hours per calendar year (8 days/year), quarterly emissions will be calculated as simply two times the higher of the two daily emissions and are shown below:

Post-Project Quarterly Emissions (Flare)					
Pollutant	NOx	SOx	PM_{10}	CO	VOC
lb/qtr	101	861	12	550	94

The annual emissions are based on the flare running the eight day/year, calculated as eight time the daily emissions, as shown below:

Post-Project Annual Emissions (Flare)					
Pollutant	NOx	SOx	PM_{10}	CO	VOC
lb/year	404	3,442	47	2,198	374

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

SSPE1 calculations are necessary to aid the following determinations:

- If the facility is becoming a new Major Source,
- An offset threshold will be surpassed, or
- A Stationary Source Increase in Permitted Emissions (SSIPE) public notice is triggered

Pursuant to District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

There is an existing annual SOx SLC for these units. For clarity, the SSPE1 will be simplified to include only the emissions from the permit units in this project:

Simplified SSPE1 Calculation (Steam Generators + Flare) (lb/year)					
Permit Unit	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
-17	9,855	28,580	4,161	17,520	4,380
-18	9,855		4,161	17,520	4,380
-19	9,855		4,161	17,520	4,380
-41	9,855		4,161	17,520	4,380
-168	404		47	2,198	374
Total	39,824	28,580	16,691	72,278	17,894

4. Post-Project Stationary Source Potential to Emit (SSPE2)

SSPE2 calculations are necessary to aid the following determinations:

- If the facility is becoming a new Major Source,
- An offset threshold will be surpassed, or
- An SSIPE public notice is triggered

Pursuant to District Rule 2201, the Post-Project Stationary Source Potential to Emit (SSPE2) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

The existing annual SOx SLC will be retained. For clarity, the SSPE2 will be simplified to include only the emissions from the permit units in this project:

Simplified SSPE2 Calculation (Steam Generators + Flare) (lb/year)					
Permit Unit	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
-17	9,308	28,580	4,161	17,520	4,380
-18	9,308		4,161	17,520	4,380
-19	9,308		4,161	17,520	4,380
-41	9,308		4,161	17,520	4,380
-168	404		47	2,198	374
Total	37,636	28,580	16,691	72,278	17,894

As shown in the following table, so there is no increase in annual potential emissions for any pollutant as a result of this project. Therefore, the facility is not becoming a new major source; an offset threshold will not be surpassed; nor will an SSIPE public notice be triggered. Therefore, the complete SSPE1 and SSPE2 calculation will not be performed at this time.

Combined Annual Emissions (Steam Generators + Flare) (lb/year)					
Pollutant	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
PE 1 (lb/yr)	39,824	28,580	16,691	72,278	17,894
PE 2 (lb/yr)	37,636	28,580	16,691	72,278	17,894
Change	-2,188	0	0	0	0

5. Rule 2201 Major Source Determination

Pursuant to Section 3.24 of District Rule 2201, a major source is a stationary source a Post-Project Stationary Source Potential to Emit (SSPE2), equal to or exceeding one or more of the Major Source threshold values (excluding ERCs banked onsite that have not been used onsite).

In project C-1083501, Aera Energy conceded that the source is an existing Major Source for all pollutants and will remain so after implementation of this project. No change in Major Source status is proposed or expected as a result of this portion of the stationary source project.

6. Rule 2410 Major Source Determination

The facility is listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i), specifically "v. fossil-fuel boilers (or combinations thereof) totaling more than 250 million British thermal units per hour heat input." These four 62.5 MMBtu/hr steam generators involved in this project total 250 MMBtu/hr and there are other, similarly sized units at this facility. Therefore the following Prevention of Significant Deterioration (PSD) Major Source thresholds in the following table are applicable.

PSD Major Source Thresholds (tons/year)							
	NO2	**VOC**	**SO2**	**CO**	**PM**	**PM10**	**CO2e**
PSD Major Source Thresholds	100	100	100	100	100	100	100,000

The CO2e emissions are calculated as follows:

EPA has established default GHG emission factors for combustion sources in 40 CFR Part 98, Subpart A, Tables C-1 and C-2 as shown:

CO2: 116.5 lb/MMBtu
CH4: 0.002 lb/MMBtu
N2O: 0.0002 lb/MMBtu

The four, natural gas fired, 62.5 MMBtu/hr steam generators are allowed to operate 24 hours/day and 7 days/week (8760 hours per year). Therefore, the CO2e emissions are calculated as

CO2 = 4 units x 62.5 MMBtu/hr/unit x 8760 hr/yr x 116.5 lb-CO2/MMBtu
x 1 lb CO2e/1 lb CO2 x 1 ton/2,000 lb
= 127,568 tons CO2e

CH4 = 4 units x 62.5 MMBtu/hr/unit x 8760 hr/yr x 0.002 lb-CH4/MMBtu
x 21 lb CO2e/1 lb CH4 x 1 ton/2,000 lb
= 46 tons CO2e

N2O = 4 units x 62.5 MMBtu/hr/unit x 8760 hr/yr x 0.0002 lb- N2O/MMBtu
x 310 lb CO2e/1 lb N2O x 1 ton/2,000 lb
= 68 tons CO2e

CO2e = (127,568 + 46 + 68) tons CO2e/yr
= 127,682 tons CO2e/yr

As shown above, the facility is an existing major source for PSD for CO2e. Therefore the facility is an existing major source for PSD.

7. Baseline Emissions (BE)

a. Annual BE

The annual BE is performed pollutant by pollutant to determine the amount of offsets required, where necessary, when the SSPE1 is greater than the offset threshold.

BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, Located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to Section 3.23

This facility is a Major Source, and is neither highly-utilized, nor fully-offset.

A Clean Emissions Unit is an emissions unit that meets one of the following criteria:

- The unit is equipped with an emissions control technology with a minimum control efficiency of at least 95% (or at least 85% for lean-burn, internal combustion engines); or
- The unit is equipped with emission control technology that meets the requirements for achieved-in-practice BACT as accepted by the APCO during the five years immediately prior to the submission of the complete application.

The steam generators do not meet the 95% control requirement. Therefore, achieved-in-practice BACT must be examined. BACT Guideline 1.2.1 covers Steam Generators at Oil Fields, but was rescinded on 10/26/09. The last version of the BACT was adopted on 3/11/2005 and was applicable through 10/25/09, which is within five years of the submission of the complete application, so it can be used for Clean Unit determinations according to the definition in Rule 2201, Section 3.13. The following table compares that Guideline with the proposed emissions/controls for the steam generators.

Clean Unit Determination for Steam Generators			
	Achieved in Practice BACT	**Proposed**	**Meets BACT?**
NOx	14 ppmvd @ 3% O2	14 ppmvd	Yes
PM10	Natural gas, LPG, waste gas treated to remove 95% by weight of sulfur compounds or treated such that the sulfur content does not exceed 1 gr of sulfur compounds (as S) per 100 scf, or use of a continuously operating SO2 scrubber and either achieving 95% by weight control of sulfur compounds or achieving an emission rate of 30 ppmvd SO2 at stack O2	9 ppmv SO2 @ 3% O2	Yes
SOx	Natural gas, LPG, waste gas treated to remove 95% by weight of sulfur compounds or treated such that the sulfur content does not exceed 1 gr of sulfur compounds (as S) per 100 scf, or use of a continuously operating SO2 scrubber and either achieving 95% by weight control of sulfur compounds or achieving an emission rate of 30 ppmvd SO2 at stack O2	9 ppmv SO2 @ 3% O2	Yes
VOC	Gaseous Fuel	Natural gas and vapor recovery gas	Yes
CO	50 ppmvd@ 3% O2	43 ppmvd@ 3% O2	Yes

Similarly, the flare does not meet the 95% control requirement. Therefore, achieved-in-practice BACT must be examined. BACT Guideline 1.4.1 covers Waste Gas Flares, it but was rescinded on 10/26/09. The last version of the BACT was adopted on 11/9/1995 and was applicable through 10/25/09, which is within five years of the submission of the complete application, so it can be used for Clean Unit determinations according to the definition in Rule 2201, Section 3.13. The following table compares that Guideline with the proposed emissions/controls for the flare.

Clean Unit Determination for Flare			
	Achieved in Practice BACT	**Proposed**	**Meets BACT?**
NOx	Steam-assisted or air-assisted when steam unavailable	Enclosed, staged-burner	Yes
PM10	Steam-assisted with smokeless combustion or air-assisted flare with smokeless combustion when steam unavailable. Pilot light fired solely on LPG or Natural Gas	Enclosed, staged-burner and natural gas pilot light	Yes
SOx	Pilot light fired solely on LPG or Natural Gas	Natural Gas Pilot Light (manufacturer's specification)	Yes
VOC	Steam-assisted or air-assisted when steam unavailable	Enclosed, staged-burner	Yes
CO	Steam-assisted or air-assisted when steam unavailable	Enclosed, staged-burner	Yes

The steam generators and the flare meet achieved-in-practice BACT for all pollutants; therefore, they are considered Clean Emissions Unit for all pollutants.

Therefore the BE is PE1 for all pollutants.

Annual BE (lb/year)		
	Steam Generators	**Flare**
NO_x	39,420	404
SO_x	28,580 (SLC)	28,580 (SLC)
PM_{10}	16,644	48
CO	70,742	2,198
VOC	17,520	374

b. Quarterly BE (QBE)

The QBE is required, unit by unit, pollutant by pollutant, to determine the Quarterly Net Emissions Change below.

Use the same BE formula above, except on a quarter by quarter basis instead of an annual basis, to calculate QBE.

Quarterly BE (lb/qtr)		
	Steam Generators	**Flare**
NO_x	7,355	101
SO_x	7,145 (SLC)	7,145 (SLC)
PM_{10}	4,161	12
CO	17,686	550
VOC	4,380	94

8. Rule 2201 SB288 Major Modification

This calculation procedure, as outlined in the version of 40 CFR 51.165 that existed on 12/19/02, states that for a major source, if a project results in a net emission increase, i.e. the sum of the differences between the potential to emit and the actual emissions (AE) for all new and modified emission units are greater than the values listed in Rule 2201 Table 3-5, the project is a SB 288 major modification. This calculation is done on a pollutant by pollutant basis.

The process for determining if a project will result in a SB288 Major Modification consists of a two-step test. The first step is to determine if the project results in a significant emission increase. For this determination, only emission increases are counted. Emission decreases associated with the project are not counted. The second step is to determine if the project results in a significant net emission increase.

If the project's emission increases are less than the significance thresholds, the project is not an SB 288 major modification and no further analysis is required. However, if the project's emission increases are above the significance thresholds in Rule 2201, Table 3-5, the project results in a significant emission increase and the second step of the test must be completed.

To determine if the project itself is a significant increase, the emissions increase is compared to the SB288 Major Modification thresholds. The increase is calculated as the difference between the new potential to emit (PE2) and the pre-project emissions (PE1), for Clean Units. As shown in the following table, the total post-porject emisisons are less than the SB288 Major Modificaiton Thresholds so any project increases cannot exceed the thresholds and the project cannot be an SB288 Major Modification.

SB288 Major Modification Determination (lb/year)				
	NO_X	**SO_X**	**PM_{10}**	**VOC**
Post Project Emissions (PE2)	37,636	28,580	16,691	17,894
SB288 Major Modification Threshold	50,000	80,000	30,000	50,000
SB288 Major Modification?	No	No	No	No

9. Rule 2201 Federal Major Modification

This facility is an existing major source for all air contaminants.

Rule 2201 section 3.18 defines Federal Major Modification the same as "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA. Section 3.17 also states that an SB 288 Major Modification is not a Federal Major Modification if the emission increase for the project or the net emission increase for the project (calculated pursuant to 40 CFR 51.165 (a)(2)(ii)(B) through (D) and (F)) does not result in a significant emission increase as defined In Rule 2201 Table 3-1 or the modification does not cause facility wide emissions to exceed a previously established plant wide applicability limit (PAL).

Rule 2201 Table 3-1
Federal Major Modification Significance Thresholds

Pollutant	Thresholds (lb/year)
VOC	0
NOx	0
PM10	30,000
SOx	80,000

The project's emission increase for each pollutant is equal the difference between the projected actual emissions (PAE) or PE and the baseline actual emissions (BAE) (for existing emission units) minus any unused baseline capacity emissions.

Emission increase = PAE – BAE – unused baseline capacity emissions

If the District determines that the proposed modification does not result in an increase in design capacity or potential to emit, and it does not impact the ability of the emission unit to operate at a higher utilization rate (and there are no existing physical or legal limitations on the unit's ability to operate at a higher utilization rate), the emission increase is presumed to be zero. In such cases, no detailed calculations are required.

The proposed increase in vapor recovery gas usage does not increase the design capacity, because the previous annual fuel limit is retained. Also, there are no physical or legal limits to the units' ability to operate at its higher permitted utilization rate. Therefore, the emissions increase is presumed to be zero and the project is not a major modification.

10. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to pollutants for which the District is in attainment or for unclassified, pollutants. The pollutants addressed in the PSD applicability determination are listed as follows:

- NO2 (as a primary pollutant)
- SO2 (as a primary pollutant)
- CO
- PM
- PM10
- Greenhouse gases (GHG): CO2, N2O, CH4, HFCs, PFCs, and SF6

a. Project Location Relative to Class 1 Area

As demonstrated in the "PSD Major Source Determination" Section above, the facility was determined to be a existing major source for PSD. Because the project is not located within 10 km of a Class 1 area – modeling of the emission increase is not required to determine if the project is subject to the requirements of Rule 2410.

b. Significance of Project Emission Increase Determination

i. Potential to Emit of attainment/unclassified pollutant for New or Modified Emission Units vs. PSD Significant Emission Increase Thresholds

As a screening tool, the potential to emit from all new and modified units is compared to the PSD significant emission increase thresholds, and if total potential to emit from all new and modified units is below this threshold, no further analysis will be needed.

PSD Significant Emission Increase Determination: Potential to Emit (tons/year)						
	NO2	**SO2**	**CO**	**PM**	**PM10**	**CO2e**
Total PE from New and Modified Units	19.9	14.3	36.1	8.4	8.4	127,568
PSD Significant Emission Increase Thresholds	40	40	100	25	15	75,000
PSD Significant Emission Increase?	No	No	No	No	No	Yes

As demonstrated above, because the project has a total potential to emit of CO2e from all new and modified emission units greater than PSD significant emission increase threshold, further analysis is required to determine if the project has an emission increase greater than the PSD significant emission increase thresholds.

ii. Emission Increase for Each Attainment/Unclassified Pollutant with a Significant Emission Increase vs. PSD Significant Emission Increase Thresholds

In this step, the emission increase for each attainment/unclassified pollutant is compared to the PSD significant emission increase thresholds, and if emission increase for each attainment pollutant is below this threshold, no further analysis is needed.

For existing emissions units, the increase in emissions is calculated as follows:

Emission Increase = PAE – (BAE + UBC)

Where: PAE = Projected Actual Emissions, and
BAE = Baseline Actual Emissions
UBC = Unused baseline capacity

Since this project does not result in an increase in design capacity or potential to emit, and it does not impact the ability of the emission unit to operate at a higher utilization rate, the UBC is the portion of PAE that the emission units could have accommodated during the baseline period. Thus, the quantity (BAE +UBC) = PE1.

Since the applicant did not provide a justified estimate of PAE, the PAE is equal to the PE2 for each permit unit.

Therefore the original equation becomes

Emission Increase = PE2 – PE1

As previously shown in the calculation section, PE2 = PE1 for SO2, CO, and PM10. For NOx, PE2 was less than PE1, so that value would be set = 0 for this calculation. The CO2e value which was calculated applies to both pre- and post-project operations so PE1 = PE2. Therefore, the Emission Increase = 0 for all pollutants, as shown in the table below:

PSD Significant Emission Increase Determination: Emission Increase (tons/year)						
	NO2	SO2	CO	PM	PM10	CO2e
Emission Increases (only)	0	0	0	0	0	0
PSD Significant Emission Increase Thresholds	40	40	100	25	15	75,000
PSD Significant Emission Increase?	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N

The project emission increase, for all new and modified emission units, does not exceed any of the PSD significant emission increase thresholds. Therefore the project does not result in a PSD major modification due to a significant emission increase and no further discussion is required.

11. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix B.

VIII. Compliance

Rule 2201 New and Modified Stationary Source Review Rule

A. BACT

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis for the following*:

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a) Any new emissions unit with a potential to emit exceeding two pounds per day,

No new emissions units are being added so BACT is not triggered for new emissions units with a PE > 2 lb/day.

b) The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,

No units are being relocated so BACT is not triggered for this reason.

c) Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day.

The steam generators and flare are existing units which are are being modified, so the AIPE calculation must be performed for all pollutants which are emitted by the units. Because the potential daily emissions from each generator are identical to each other, a representative calculation will be done.

AIPE = PE2 - HAPE, where

AIPE = Adjusted increase in Permitted Emissions in lb/day
PE2 = the emissions units post project PE in lb/day
HAPE = PE1 x (EF2/EF1) (if EF2 > EF, set EF2/EF1 to 1)

AIPE (Steam Generators)									
Pollutant	**PE_2**	**-**	**(PE_1**	**x**	**(EF2**	**/**	**EF1))**	**=**	
NOx	25.5		27		0.017		0.018		0
SOx	22.8		22.8		0.015		0.015		0
PM10	11.4		11.4		0.0076		0.076		0
CO	48		48		0.032		0.032		0
VOC	12		12		0.008		0.008		0

AIPE (Flare)									
Pollutant	**PE_2**	**-**	**(PE_1**	**x**	**(EF2**	**/**	**EF1))**	**=**	
NOx	50.5		50.5		0.068		0.068		0
SOx	226		226		3.31		3.32		0
PM10	5.9		5.9		0.008		0.008		0
CO	274.8		274.8		0.37		0.37		0
VOC	46.8		46.8		0.063		0.063		0

Since the AIPE = 0, BACT is not triggered by the modified units.

d) Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

As shown in Section VII.C.7, this project does not result in an SB 288 Major Modification or a Federal Major Modification. Therefore, BACT is not trigger for the steam generators or the flare.

2. BACT Analysis

Because BACT was not triggered, no further discussion is required.

B. OFFSETS

1. Offset Applicability

Offset requirements shall be triggered if the SSPE2 equals or exceeds the Offset Threshold levels. The facility is a Major Source with pre-project emissions above the Offset Levels.

2. Quantity of Offsets Required

For projects where the SSPE1 met or exceeded the Offset Threshold, offsets are calculated as the difference between the post-project Potential to Emit and the Baseline Emissions. The offsets required are calculated below.

Offsets Required (lb/year)					
Pollutant	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
PE 1 (lb/yr)	39,824	28,580	16,691	72,278	17,894
PE 2 (lb/yr)	37,636	28,580	16,691	72,278	17,894
Offsets required	-2,188	0	0	0	0

Since offsets are not required, no further discussion is required.

C. Public Notification

1. Applicability

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
c. Any project which results in the offset thresholds being surpassed, and/or
d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

As demonstrated in VII.C.7, this project does not constitute an SB 288 or Federal Major Modification; therefore, public noticing for SB 288 or Federal Major Modification purposes is not required.

b. PE > 100 lb/day

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. There are no new emissions units associated with this project. Therefore public noticing is not required for this project for PE > 100 lb/day.

c. Offset Threshold

As detailed above, there were no increases in potential emissions so there were no increases beyond the offset thresholds with this project; therefore public noticing is not required for offset purposes.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE = SSPE2 – SSPE1. There were no increases in potential emissions with this project so SSIPE = 0 and therefore, public noticing is not required for SSIPE > 20,000 lb/year.

2. Public Notice Action

As discussed above, this project will not result in emissions, for any pollutant, which would subject the project to any of the noticing requirements listed above. Therefore, public notice will not be required for this project.

D. Daily Emission Limits (DELs)

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

For these units, the DELs are stated in the form of direct daily limits, along with maximum gas throughput for both natural and casing gas, and maximum sulfur content. The following conditions will be placed on the ATC:

1. Steam Generators (-17, -18, -19, -41)

- Fuel consumption for the steam generator shall not exceed 1,500 MMBtu/day. [District Rule 2201] Y

- Combined quantity of well vent and tank vapor recovery gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 1,300,000 scf/day. [District Rule 2201] Y

- Only natural gas, vapor recovery gas, or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Y

- Emission rates shall not exceed any of the following limits: NOx (as NO2): 14 ppmv @ 3% O2 or 0.017 lb/MMBtu (27.0 lb/day), CO: 43 ppmv @ 3%O2 or 0.032 lb/MMBtu (48.0 lb/day), PM10: 0.0076 lb/MMBtu (11.4 lb-PM10/day), or VOC: 0.008 lb/MMBtu (12.0 lb/day). [District Rule 2201, 4201, 4305, 4306 and 4320] Y

- When fired on PUC quality natural gas, the SOx emissions rate shall not exceed 0.00285 lb/MMBtu. [District Rule 2201 and 4320] Y

- When fired on gases other than PUC quality natural gas, the SOx emissions rate shall not exceed 9 ppmv @ 3% O2 or 0.015 lb/MMBtu (22.8 lb/day). [District Rule 2201 and 4320] Y

- Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201] Y

2. Flare (-168)

- Fuel consumption for the flare shall not exceed 1.35 MMscf/day. [District Rule 2201] Y

- Combined exhaust gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 1,300,000 scf/day. [District Rule 2201] Y

- Only natural gas, vapor recovery gas, or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Y

- When fired only on natural gas, emissions from the flare shall not exceed any of the following limits: 0.008 lb-PM10/MMBtu; 0.00285 lb-SOx/MMBtu calculated as SO2; 0.068 lb-NOx/MMBtu calculated as NO2, or 30 ppmv @ 3% O2; 0.063 lb-VOC/MMBtu, or 0.37 lb-CO/MMBtu. [District NSR Rules, Rule 4201, 3.1 & Rule 4301, 5.1, 5.2] Y

- When fired only on waste gas, emissions from the flare shall not exceed any of the following limits: 0.0.008 lb-PM10/MMBtu; 3.31lb-SOx/MMBtu calculated as SO2; 0.068 lb-NOx/MMBtu calculated as NO2, or 30 ppmv @ 3% O2; 0.063 lb-VOC/MMBtu, or 0.37 lb-CO/MMBtu. [District NSR Rules, Rule 4201, 3.1 & Rule 4301, 5.1, 5.2] Y

- Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201] Y

- The sulfur content of treated waste gas exiting the H2S Scavenger System shall not exceed 5000 ppmv. Sulfur content shall be determined on a daily basis by gas detector tube sampling. [District Rule 2201] Y

- Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Y
- Operation of this flare shall only occur when steam generators C-1121-17, -18,-19, and -41 are all shut down due to maintenance. [District Rule 2201] Y

- Gas line to flare shall be equipped with operational, volumetric flow rate indicator. [District Rule 2201] Y

- Operation of the flare shall not exceed 48 hours per calendar quarter or 192 hours per calendar year. [District Rule 2201] Y

E. Compliance Assurance

1. Source Testing

Source testing is required to demonstrate compliance with NOx and CO emission limits on certain high-emission units. The following conditions will be placed on the ATC:

a. Steam Generators (-17, -18, -19, -41)

- Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted at least once every twelve (12) months, (no more than 30 days before or after the required annual source test date). After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months, (no more than 30 days before or after the required 36 months source test date). If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 6.3.1, 4306, 6.3.1, and 4351, 6.3.1] N

- The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305 and 4306] Y

- For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305 and 4306] Y

- All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30

minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305 and 4306] Y

- Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Y

- The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, NOx (lb/MMBtu) - EPA Method 19, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, stack gas moisture content - EPA Method 4, stack gas velocities - EPA Method 2, and fuel gas sulfur content - ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rules 1081, 4305, 4306, 6.2, and 4351] Y

- NOx, and CO emissions shall be measured with annual source testing conducted by independent testing laboratory with sample collection by ARB certified testing laboratory and shall be witnessed or authorized by the District. [District Rule 1081, 3.0, 4.0 and Rule 2520, 9.4.2] Y

- If the steam generator is fired on PUC-regulated natural gas, then the permittee shall maintain on file copies of all natural gas bills or fuel throughput records for a period of five years. [District Rule2520, 9.3.2] N

- If the steam generator is not fired on PUC-regulated natural gas, then the sulfur content of the non-certified (non PUC/FERC regulated) natural gas being fired in the steam generator shall be determined using ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rule 2520, 9.3.2] Y

b. Flare (-168)

Source testing is not required for the flare.

2. Monitoring

Periodic monitoring is required to determine compliance between source tests. The following conditions will be placed on the ATC to ensure continued compliance:

a. Steam Generators (-17, -18, -19, -41)

- The sulfur content of treated waste gas exiting the H2S Scavenger System shall be determined on a daily basis by gas detector tube sampling. [District Rules 2201 and 4320] Y

- The sulfur content of the waste gas exiting the sulfur treatment system shall be tested weekly for sulfur content and higher heating value. If compliance with the sulfur emission limits has been demonstrated for 8 consecutive weeks, then the fuel testing frequency shall be semi-annually. If a semi-annual fuel content

source test fails to show compliance, weekly testing shall resume. Testing shall be by grab sample analysis by GC-FPD/TCD or other District approved methods for H2S and mercaptans performed in the laboratory and EPA Method 19. [District Rules 2201 and 4320] Y

- Daily SOx emissions from combustion of waste gas shall be calculated based on the waste gas sulfur content as determined by gas detector tube sampling or the most recent laboratory analysis, whichever is greater. [District Rule 2201 and 4320] Y
- The sulfur content of treated waste gas exiting the H2S Scavenger System shall be determined on a daily basis by gas detector tube sampling. [District Rules 2201 and 4320] Y

- Daily SOx emissions from combustion of waste gas shall be calculated based on the waste gas sulfur content as determined by gas detector tube sampling or the most recent laboratory analysis, whichever is greater. [District Rule 2201 and 4320] Y

- When source or type of gas changes, sampling for sulfur content shall be conducted within one week. A change in fuel type is defined as changing between any of the following: PUC-Quality gas, unprocessed field gas, or any field gas with any specific level of pretreatment. [District Rule 2520, 9.3.2] Y

- At least once every 12 months, unit shall be stack tested to demonstrate compliance with the SOx emission limit required by this permit (ppmv @3 % O2) using EPA Method 6C, Method 8 or ARB Method 100. Stack testing for SOx emissions in not required if unit was fired only on PUC quality natural during the 12 months prior to the compliance testing anniversary date. [District Rules 2201 and 4320] Y

- If the unit is fired on noncertified gaseous fuel and compliance with SOx emission limits is achieved through fuel sulfur content limitations, then the sulfur content of the gaseous fuel being fired in the unit shall be determined using ASTM D 1072, D 3031, D 4084, D 3246 or grab sample analysis by GC-FPD/TCD performed in the laboratory. [District Rule 2520, 9.4.2] Y

- If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rules 2520, 9.4.2 and 4305, 6.2.1] Y

- Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods [District Rule 4305, 5.5.6 and 4306, 5.3] Y

- Subject to the definitions and requirements of Section 5.3, District Rule 4306, emission factor limitations of this permit shall not apply during periods of startup, shutdown, or refractory curing. Duration of startup and shutdown shall not exceed 2 hours each per occurrence. Refractory curing period is defined as a maintenance-based reduced-load period of time during which a unit is brought from a shutdown status to staged rates of firing for the sole purpose of curing new refractory lining in the heat exchanger section of the unit, and shall not exceed 30 hours per occurrence. [District Rules 4305 and 4306] Y

- The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Y
- All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Y

- If either the NOx or CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Y

b. Flare (-168)

- The sulfur content of treated waste gas exiting the H2S Scavenger System shall not exceed 5,000 ppmv. Sulfur content shall be determined on a daily basis by gas detector tube sampling. [District Rule 2201] Y

3. Record Keeping

Daily records are required to document compliance with monitoring, source testing and other permit requirements. The following conditions will be placed on the ATC:

a. Steam Generators (-17, -18, -19, -41)

- The permittee shall maintain records of: (1) the date and time of NOx, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NOx and CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Y

- Permittee shall maintain daily record of all natural gas consumption including waste gas consumption, fuel sulfur content, calculated SOx emissions, supplier certifications and test results to show compliance with the conditions of this permit. The operator shall record daily amount and type (s) of fuel(s) combusted and all dates on which unit is fired on any non-certified fuel and record specific type(s) of non-certified fuel used. [District Rule 1070 and District Rule 2520, section 9.4.2] N

- All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, 4306 and 4320]

b. Flare (-168)

- Records of operating hours, sulfur content, and gas volume flared shall be maintained, retained on the premises for at least five years, and be made available for District inspection on request. [District Rule 2201] Y

4. Reporting

Reporting of specific information may be required to ensure the District has a timely review of required tests or monitoring. The following conditions will be placed on the ATC:

a. Steam Generators (-17, -18, -19, -41)

- The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] N

- Annual test results submitted to the District from unit(s) representing a group of units may be used to measure NOx emissions of this permit for that group, provided the selection of the representative unit(s) is approved by the APCO prior to testing. Should any of the representative units exceed the required NOx emission limits of this permit, each of the units in the group shall demonstrate

compliance by emissions testing within 90 days of the failed test. (This requirement shall not supersede a more stringent NSR or PSD permit testing requirement.)

b. Flare (-168)

There are no reporting requirements for the flare.

Rule 2520 – Federally Mandated Operating Permits

Aera Energy, LLC's Fresno Heavy Oil stationary source has a Title V permit. The proposed modification is a Minor Modification to the Title V Permit.

In accordance with Rule 2520, these modifications:

1. Do not violate requirements of any applicable federally enforceable local or federal requirement;
2. Do not relax monitoring, reporting, or recordkeeping requirements in the permit and are not significant changes in existing monitoring permit terms or conditions;
3. Do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis;
4. Do not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject. Such terms and conditions include:
   a. A federally enforceable emission cap assumed to avoid classification as a modification under any provisions of Title I of the Federal Clean Air Act; and
   b. An alternative emissions limit approved pursuant to regulations promulgated under section 112(i)(5) of the Federal Clean Air Act; and
5. Are not Title I modifications as defined in District Rule 2520 or modifications as defined in section 111 or 112 of the Federal Clean Air Act; and
6. Do not seek to consolidate overlapping applicable requirements.

The changes authorized by these ATCs meet these criteria and therefore constitute a minor modification of their Title V permit. The facility has requested that this ATC be issued with a Certificate of Conformity (COC). Therefore, prior to issuance, this ATC will undergo a 45 day EPA review. Prior to initial operation under these ATCs, the applicant must submit a Title V application for an administrative amendment, and permit conditions will be listed as follows:

- {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201]

- {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4]

Rule 4001 - New Source Performance Standards

40 CFR Part 60, Subpart Dc applies to Small Industrial-Commercial-Industrial Steam Generators between 10 MMBtu/hr and 100 MMBtu/hr (post-6/9/89 construction, modification or, reconstruction).

40 CFR Part 60, Subpart A, Section 60.2, defines the "modification" as

"any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted."

No newly constructed or reconstructed units are proposed in this project, nor is the unit being modified, as defined above, since no air pollutant emission is being increased. Therefore, this standard does not apply.

Rule 4101 – Visible Emissions

Rule 4101 states that no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. Opacity is expected to be less than 20% provided that all of the equipment is maintained and operated properly. The following condition will be listed on the ATC to ensure compliance:

- {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

Rule 4102 - Nuisance

Rule 4102 states that no air contaminant shall be released into the atmosphere which causes a public nuisance. Public nuisance conditions are not expected as a result of this operation provided the equipment is well maintained. Therefore, the following condition will be listed on the ATC to ensure compliance:

- {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 - Risk Management Policy for Permitting New and Modified Sources (dated 3/2/01) specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (Appendix E), the total facility prioritization score including this project was greater than one. Therefore, an HRA

was required to determine the short-term acute and long-term chronic exposure from this project.

The cancer risk for this project is shown below:

HRA Summary		
Unit	Cancer Risk	T-BACT Required
C-1121-17-26, -18-26, -19-26, -41-26 and 168-11	3.31 per million	Yes

Discussion of T-BACT

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is required for this project because the HRA indicates that the risk is above the District's thresholds for triggering T-BACT requirements.

For this project T-BACT is triggered for VOC. T-BACT is satisfied with BACT for VOC (see Appendix F), which is the use of natural gas as a supplemental fuel; therefore, compliance with the District's Risk Management Policy is expected. The following condition will be listed on the ATCs to ensure compliance:

- {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102] N

Rule 4201 - Particulate Matter Concentration

Particulate matter emissions from the engine will be less than or equal to the rule limit of 0.1 grain per cubic foot of gas at dry standard conditions. The highest post-project PM10 emission rate is 0.008, which produces the grain loading shown by the following equation:

$$0.008 \quad \frac{g - PM_{10}}{bhp - hr} \times \frac{1\,bhp - hr}{2{,}542.5\,Btu} \times \frac{10^6\,Btu}{8{,}578\,dscf} \times \frac{0.35\,Btu_{out}}{1\,Btu_{in}} \times \frac{15.43\,grain}{g} = \quad 0.002 \quad \frac{grain - PM}{dscf}$$

Since 0.002 grain-PM/dscf is ≤ to 0.1 grain per dscf, compliance with Rule 4201 is expected. The following condition will be listed on the ATCs to ensure compliance:

- {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Rule 4301 – Fuel Burning Equipment

The purpose of this rule is to limit the emission of air contaminants from fuel burning equipment. With fuel burning equipment being any furnace, boiler, apparatus, or stack used for producing heat or power by indirect transfer. This rule limits the concentration of combustion contaminants and specifies maximum emission rates for sulfur dioxide, nitrogen oxide and combustion contaminant emissions.

The rule states that a person shall not discharge into the atmosphere combustion contaminants exceeding in concentration at the point of discharge, 0.1 grain per cubic foot of gas calculated to 12% of carbon dioxide at dry standard conditions.

The rule also states that a person shall not build, erect, install or expand any non-mobile fuel burning equipment unit unless the discharge into the atmosphere of contaminants will not and does not exceed any one or more of the following rates:

- 200 pounds per hour of sulfur compounds, calculated as SO_2,
- 140 pounds per hour of nitrogen oxides, calculated as NO_2,
- Ten pounds per hour of combustion contaminants (particulate matter discharged into the atmosphere from the burning of any kind of material containing carbon in a free or combined state), which is 5 lb-PM_{10}/hr, and derived from the fuel.

Expected emissions of sulfur compounds, as SO_2, from the units will not exceed 200 lb/hr for this project as shown in section VII.C

Steam Generator: 22.8 lb/day = 1.0 lb/hr < 200 lb/hr
Flare: 430.3 lb/day = 17.9 lb/hr < 200 lb/hr

Expected emissions of nitrogen compounds, as NO_2, from the boilers will not exceed 140 lb/hr for this project as shown in section VII.C

Steam Generator: 25.5 lb/day = 1.1 lb/hr < 140 lb/hr
Flare: 8.8 lb/day = 0.4 lb/hr < 140 lb/hr

Expected emissions of combustion contaminants, as PM_{10}, from the boilers will not exceed 10 lb/hr for this project as shown in section VII.C

Steam Generator: 11.4 lb/day = 0.5 lb/hr < 10 lb/hr
Flare: 1.0 lb/day = 0.04 lb/hr < 10 lb/hr

Thus compliance with this rule is expected.

Rule 4305 - Boilers, Steam Generators and Process Heaters – Phase 2

This rule limits NOx and CO emissions from boilers, steam generators, and process heaters rated greater than 5 MMBtu/hr. The subject units are currently in compliance with the applicable provisions of this rule. Source testing, monitoring and recordkeeping requirements

of Rule 4320 are equal to or more stringent than the requirements of this rule; therefore, continued compliance is expected

Rule 4306 - Boilers, Steam Generators and Process Heaters – Phase 3

This rule limits NOx and CO emissions from boilers, steam generators, and process heaters rated greater than 5 MMBtu/hr. The subject units are currently in compliance with the applicable provisions of this rule. Source testing, monitoring and recordkeeping requirements of Rule 4320 are equal to or more stringent than the requirements of this rule; therefore, continued compliance is expected

Rule 4311 - Flares

This rule is applicable to operations involving the use of flares.

Since the flare is currently designated as a Dormant Emissions Unit, the fuel supply line has been permanently removed and the equipment is prohibited from operating prior to obtaining an Authority to Construct. Compliance with the applicable rule conditions will be determined at the time of issuance of the activating ATC. The following conditions will be listed on the proposed ATC to ensure compliance:

- This equipment shall not be operated for any reason until an Authority to Construct permit is issued approving all necessary retrofits required to comply with the applicable requirements of District Rule 4311. [District Rule 4311] Y

- The operator shall permanently disconnect the fuel supply line serving this unit. [District Rule 4311] Y

Rule 4320 Advance Emission Reduction Options for Boilers, Steam Generators and Process Heaters, greater than 5 MMBtu/hr

This rule limits NOx, CO, SO2 and PM10 emissions from boilers, steam generators and process heaters rated greater than 5 MMBtu/hr. This rule also provides a compliance option of payment of fees in proportion to the actual amount of NOx emitted over the previous year.

The units in this project are all rated at greater than 5 MMBtu/hr heat input, so the provisions of this rule apply.

Section 5.1 NOx Emission Limits

Section 5.1 states that an operator of a unit subject to this rule shall comply with all applicable requirements of the rule and one of the following, on a unit-by-unit basis:

5.1.1 Operate the unit to comply with the emission limits specified in Sections 5.2 and 5.4; or

5.1.2 Pay an annual emissions fee to the District as specified in Section 5.3 and comply with the control requirements specified in Section 5.4; or

5.1.3 Comply with the applicable Low-use Unit requirements of Section 5.5.

The operator will comply with this section under the provisions of Section 5.1.2.

Section 5.4 Particulate Matter Control Requirements

Section 5.4.1 states that to limit particulate matter emissions, an operator shall comply with one of the options listed in the following requirements:

Section 5.4.1.1	provides option for the operator to comply with the rule by firing the unit exclusively on PUC-quality natural gas, commercial propane, butane, or LPG, or a combination of such gases.
Section 5.4.1.1	On and after the applicable NOx Compliance Deadline specified in Section 5.2 Table 1, operators shall fire units exclusively on PUC-quality natural gas, commercial propane, butane, or liquefied petroleum gas, or a combination of such gases;
Section 5.4.1.2	On and after the applicable NOx Compliance Deadline specified in Section 5.2 Table 1, operators shall limit fuel sulfur content to no more than five (5) grains of total sulfur per one hundred (100) standard cubic feet; or
Section 5.4.1.3	On and after the applicable NOx Compliance Deadline specified in Section 5.2 Table 1, operators shall install and properly operate an emission control system that reduces SO_2 emissions by at least 95% by weight; or limit exhaust SO_2 to less than or equal to 9 ppmv corrected to 3.0% O2.

The units that utilize scrubbed waste gas will limit exhaust SO_2 to less than or equal to 9 ppmv corrected to 3.0% O2.

Section 5.7.6 Monitoring SOx Emissions

Operators complying with Section 5.4.1.3 shall perform an annual source test unless a more frequent sampling and reporting period is included in the Permit to Operate. Therefore the following conditions will be placed on the ATC:

- At least once every 12 months, unit shall be stack tested to demonstrate compliance with the SOx emission limit required by this permit (ppmv @3 % O2) using EPA Method 6C, Method 8 or ARB Method 100. Stack testing for SOx emissions in not required if unit was fired only on PUC quality natural during the 12 months prior to the compliance testing anniversary date.

- Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

Section 5.6 Startup and Shutdown Provisions

Section 5.6 states that on and after the full compliance deadline specified in Section 5.0, the applicable emission limits of Sections 5.2 Table 1 and 5.5.2 shall not apply during start-up or shutdown provided an operator complies with the requirements specified in Sections 5.6.1 through 5.6.5.

Aera has proposed to retain existing start-up and shutdown duration limits of 2 hours and 2 hours, respectively. Emissions during start-up and shutdown will not be subject to the emission limits in Sections 5.2 and 5.2.2.

Section 5.8 Compliance Determination

Section 5.8.2 requires that all emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. Unless otherwise specified in the Permit to Operate, no determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0. Therefore, the following permit condition will be listed on the ATCs as follows:

- All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. Unless otherwise specified in the Permit to Operate, no determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4320. [District Rules 4305, 4306 and 4320]

Section 5.8.5 requires that for emissions source testing performed pursuant to Section 6.3.1 for the purpose of determining compliance with an applicable standard or numerical limitation of this rule, the arithmetic average of three (3) 30-consecutive-minute test runs shall apply. If two (2) of three (3) runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. Therefore, the following permit condition will be listed on the permit as follows:

- For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305, 4306 and 4320]

Section 6.1 Recordkeeping

Section 6.1 requires that the records required by Sections 6.1.1 through 6.1.5 shall be maintained for five calendar years and shall be made available to the APCO and EPA upon request. Failure to maintain records or information contained in the records that demonstrate noncompliance with the applicable requirements of this rule shall constitute a violation of this rule.

Recordkeeping will be required by the permit condition, as previously discussed in the Rule 2201 compliance discussion.

Section 6.2, Test Methods

Section 6.2 identifies test methods to be used when determining compliance with the rule. The following existing permit conditions will be retained on the ATCs:

- {109} Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]
- The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, NOx (lb/MMBtu) - EPA Method 19, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, stack gas moisture content - EPA Method 4, stack gas velocities - EPA Method 2, and fuel gas sulfur content - ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rules 4305, 4306 and 4320]

Conclusion

Conditions will be incorporated into the ATCs in order to ensure compliance with the PM_{10} requirements of this rule, see attached draft ATCs. Therefore, compliance with District Rule 4320 requirements is expected.

Rule 4351 – Boilers, Steam Generators, and Process Heaters – Reasonably Available Control Technology

The purpose of this rule is to limit emissions of NO_X from boilers, steam generators, and process heaters to levels consistent with reasonably available control technology (RACT). This rule applies to any boiler, steam generator or process heater, with a rated heat input greater than 5 million Btu per hour that is fired with gaseous and/or liquid fuels, and is included in a major NO_X source. This rule does not apply to any unit located west of Interstate Highway 5 located in Fresno, Kern, or Kings County.

As the boilers involved in this project are located in the Coalinga, which is west of Interstate 5, the requirements of this rule do not apply.

Rule 4401 – Steam Enhanced Crude Oil Production Well Vents

The purpose of this rule is to limit the VOC emissions from steam-enhanced crude oil production well vents. This rule is applicable to all steam-enhanced crude oil production wells and any associated vapor collection and control systems. This rule requires collection and 99% control of VOC emissions from oil wells that are using steam generation in the production of oil, unless the facility is a small producer.

The collection and subsequent combustion of the vapor recovery gas in the steam generators involved in this project constitutes 99% control as stipulated by this rule.

Rule 4801 – Sulfur Compounds

The purpose of this rule is to limit the emissions of sulfur compounds. The limit is that sulfur compound emissions (as SO_2) shall not exceed 0.2% by volume.

A person shall not discharge into the atmosphere sulfur compounds, which would exist as a liquid or gas at standard conditions, exceeding in concentration at the point of discharge: 0.2 % by volume calculated as SO_2, on a dry basis averaged over 15 consecutive minutes.

$$9\,ppmv \times \frac{20.9}{20.9-3} = 10.5 \frac{parts}{million}$$

$$Sulfur\ Concentration = 10.5 \frac{parts}{million} < 2{,}000 \text{ ppmv (or 0.2\%)}$$

Therefore, compliance with District Rule 4801 requirements is expected.

California Health & Safety Code 42301.6 (School Notice)

The emissions units are not located within 1000 feet of the outer boundary of any K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The San Joaquin Valley Unified Air Pollution Control District (District) adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The District performed an Engineering Evaluation (this document) for the proposed project and determined that the activity will occur at an existing facility and the project involves negligible expansion of the existing use. Furthermore, the District determined that the activity will not have a significant effect on the environment. The District finds that the activity is categorically exempt from the provisions of CEQA pursuant to CEQA Guideline § 15031 (Existing Facilities), and finds that the project is exempt per the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment (CEQA Guidelines §15061(b)(3)).

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Issue Authority to Construct C-1121-17-26, -18-26, -19-26, -41-26, and -168-11 subject to the permit conditions on the attached Authority to Construct in Appendix C.

X. Billing Information

Annual Permit Fees			
Permit Number	**Fee Schedule**	**Fee Description**	**Annual Fee**
C-1121-17-26	3020-02-H	Greater than 15 MMBtu/hr (62.5 MMBtu/hr)	$1030.00
C-1121-18-26	3020-02-H	Greater than 15 MMBtu/hr (62.5 MMBtu/hr)	$1030.00
C-1121-19-26	3020-02-H	Greater than 15 MMBtu/hr (62.5 MMBtu/hr)	$1030.00
C-1121-41-26	3020-02-H	Greater than 15 MMBtu/hr (62.5 MMBtu/hr)	$1030.00
C-1121-168-11	3020-02-G	5.0 or Greater but less than 15.0 (7.16 MMBtu/hr)	$815.00

Appendix A – Current PTOs/ATCs
Appendix B - QNEC Calculations
Appendix C – Flare SOx Emissions Factor Derivation
Appendix D – Draft ATCs and Emission Profiles
Appendix E – Health Risk Assessment
Appendix F – BACT Guideline

Appendix A
Current PTOs/ATCs

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

AUTHORITY TO CONSTRUCT

PERMIT NO: C-1121-17-24 **ISSUANCE DATE:** 05/26/2011

LEGAL OWNER OR OPERATOR: AERA ENERGY LLC
MAILING ADDRESS: 10000 MING AVE
P O BOX 11164
BAKERSFIELD, CA 93389-1164

LOCATION: HEAVY OIL PRODUCTION
FRESNO COUNTY, CA

SECTION: 26 **TOWNSHIP:** 19S **RANGE:** 15E

EQUIPMENT DESCRIPTION:
MODIFICATION OF SG S-9, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH COEN QLN ULN BURNER AND FLUE GAS RECIRCULATION SERVED BY LO-COST H2S SCAVENGER SYSTEM SHARED WITH PERMIT UNITS C-1121-18, '-19 AND '-41: INSTALL SULFATREAT VESSELS DOWNSTREAM OF LO-COST SCAVENGING SYSTEM FOR H2S REMOVAL AND LIMIT EXHAUST SOX EMISSIONS TO 9 PPMV @3% O2 FOR RULE 4320 COMPLIANCE

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2520] Federally Enforceable Through Title V Permit
2. Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Fuel consumption for the steam generator shall not exceed 1,500 MMBtu/day. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Combined quantity of well vent and tank vapor recovery gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 675,000 scf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

Seyed Sadredin, Executive Director / APCO

DAVID WARNER, Director of Permit Services
C-1121-17-24 : May 26 2011 4:23PM – DAVIDSOS : Joint Inspection NOT Required

5. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements of SJVUAPCD Rules 4201 (Amended December 17, 1992), and 4301 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

6. Only natural gas, vapor recovery gas, or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Federally Enforceable Through Title V Permit

7. Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

8. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

9. Emission rates shall not exceed any of the following limits: NOx (as NO2): 15 ppmv @ 3% O2 or 0.018 lb/MMBtu (27.0 lb/day), CO: 43 ppmv @ 3%O2 or 0.032 lb/MMBtu (48.0 lb/day), PM10: 0.0076 lb/MMBtu (11.4 lb-PM10/day), or VOC: 0.008 lb/MMBtu (12.0 lb/day). [District Rule 2201, 4201, 4305, 4306 and 4320] Federally Enforceable Through Title V Permit

10. When fired on PUC quality natural gas, the SOx emissions rate shall not exceed 0.00285 lb/MMBtu. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

11. When fired on gases other than PUC quality natural gas, the SOx emissions rate shall not exceed 9 ppmv @ 3% O2 or 0.015 lb/MMBtu (22.8 lb/day). [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

12. Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201]

13. The sulfur content of treated waste gas exiting the H2S Scavenger System shall be determined on a daily basis by gas detector tube sampling. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

14. The sulfur content of the waste gas exiting the sulfur treatment system shall be tested weekly for sulfur content and higher heating value. If compliance with the sulfur emission limits has been demonstrated for 8 consecutive weeks, then the fuel testing frequency shall be semi-annually. If a semi-annual fuel content source test fails to show compliance, weekly testing shall resume. Testing shall be by grab sample analysis by GC-FPD/TCD or other District approved methods for H2S and mercaptans performed in the laboratory and EPA Method 19. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

15. Daily SOx emissions from combustion of waste gas shall be calculated based on the waste gas sulfur content as determined by gas detector tube sampling or the most recent laboratory analysis, whichever is greater. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

16. When source or type of gas changes, sampling for sulfur content shall be conducted within one week. A change in fuel type is defined as changing between any of the following: PUC-Quality gas, unprocessed field gas, or any field gas with any specific level of pretreatment. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

17. Within 60 days of startup and at least once every 12 months thereafter, unit shall be stack tested to demonstrate compliance with the SOx emission limit required by this permit (ppmv @3 % O2) using EPA Method 6C, Method 8 or ARB Method 100. Stack testing for SOx emissions in not required if unit was fired only on PUC quality natural during the 12 months prior to the compliance testing anniversary date. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

18. If the unit is fired on noncertified gaseous fuel and compliance with SOx emission limits is achieved through fuel sulfur content limitations, then the sulfur content of the gaseous fuel being fired in the unit shall be determined using ASTM D 1072, D 3031, D 4084, D 3246 or grab sample analysis by GC-FPD/TCD performed in the laboratory. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

19. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rules 2520, 9.4.2 and 4305, 6.2.1] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

20. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rule 4305, 5.5.6 and 4306, 5.3] Federally Enforceable Through Title V Permit

21. Subject to the definitions and requirements of Section 5.3, District Rule 4306, emission factor limitations of this permit shall not apply during periods of startup, shutdown, or refractory curing. Duration of startup and shutdown shall not exceed 2 hours each per occurrence. Refractory curing period is defined as a maintenance-based reduced-load period of time during which a unit is brought from a shutdown status to staged rates of firing for the sole purpose of curing new refractory lining in the heat exchanger section of the unit, and shall not exceed 30 hours per occurrence. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

22. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

23. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

24. If either the NOx or CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

25. The permittee shall maintain records of: (1) the date and time of NOx, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NOx and CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

26. Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted at least once every twelve (12) months, (no more than 30 days before or after the required annual source test date). After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months, (no more than 30 days before or after the required 36 months source test date). If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 6.3.1, 4306, 6.3.1, and 4351, 6.3.1]

27. The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

28. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

29. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

30. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

31. The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, NOx (lb/MMBtu) - EPA Method 19, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, stack gas moisture content - EPA Method 4, stack gas velocities - EPA Method 2, and fuel gas sulfur content - ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rules 1081, 4305, 4306, 6.2, and 4351] Federally Enforceable Through Title V Permit

32. NOx, and CO emissions shall be measured with annual source testing conducted by independent testing laboratory with sample collection by ARB certified testing laboratory and shall be witnessed or authorized by the District. [District Rule 1081, 3.0, 4.0 and Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

33. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

34. If the steam generator is fired on PUC-regulated natural gas, then the permittee shall maintain on file copies of all natural gas bills or fuel throughput records for a period of five years. [District Rule2520, 9.3.2]

35. If the steam generator is not fired on PUC-regulated natural gas, then the sulfur content of the non-certified (non PUC/FERC regulated) natural gas being fired in the steam generator shall be determined using ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

36. Compliance with permit conditions in the Title V permit shall be deemed compliance with the requirements of County Rules 108 (Kings), 108.1 (Fresno, Merced, San Joaquin, Tulare, Kern, and Stanislaus), and 110 (Madera), 402 (Madera), 404 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 405 (Madera), 408 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 407.2 (Kern, Tulare, Kings, Stanislaus, and San Joaquin), and 408.2 (Merced). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

37. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements: SJVUAPCD Rules 4201 (Last Amended December 17, 1992), 4301 (Last Amended December 17, 1992), 4406 (Amended December 17, 1992), and 4801 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2]

38. This unit commenced construction, modification, or reconstruction prior to June 19, 1984. This unit has not been used to produce electricity for sale in 1985 or on or after November 15, 1990. Therefore, the requirements of 40 CFR 72.6(b) and 40 CFR 60.40c do not apply to this source. A permit shield is granted from this requirement. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

39. Permittee shall maintain daily record of all natural gas consumption including waste gas consumption, fuel sulfur content, calculated SOx emissions, supplier certifications and test results to show compliance with the conditions of this permit. The operator shall record daily amount and type (s) of fuel(s) combusted and all dates on which unit is fired on any non certified fuel and record specific type(s) of non certified fuel used. [District Rule 1070 and District Rule 2520, section 9.4.2]

40. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, and 4306]

41. ATCs C-1121-17-19, '-17-21, '-17-22, and '-17-23, shall be canceled upon implementation of this ATC. [District Rule 2201] Federally Enforceable Through Title V Permit

42. This ATC shall be implemented concurrent with ATCs C-1121-18-24, '-19-24, '-41-24, and '-168-10 [District Rule] Federally Enforceable Through Title V Permit

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

AUTHORITY TO CONSTRUCT

PERMIT NO: C-1121-18-24 **ISSUANCE DATE:** 05/26/2011

LEGAL OWNER OR OPERATOR: AERA ENERGY LLC
MAILING ADDRESS: 10000 MING AVE
P O BOX 11164
BAKERSFIELD, CA 93389-1164

LOCATION: HEAVY OIL PRODUCTION
FRESNO COUNTY, CA

SECTION: 29 **TOWNSHIP:** 19S **RANGE:** 15E

EQUIPMENT DESCRIPTION:
MODIFICATION OF SG S-10, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER, AND A FLUE GAS RECIRCULATION (FGR) SYSTEM SERVED BY LO-COST H2S SCAVENGER SYSTEM SHARED WITH PERMIT UNITS C-1121-17, '-19 AND '-41: INSTALL SULFATREAT VESSELS DOWNSTREAM OF LO-COST SCAVENGING SYSTEM FOR H2S REMOVAL AND LIMIT EXHAUST SOX EMISSIONS TO 9 PPMV @3% O2 FOR RULE 4320 COMPLIANCE

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2520] Federally Enforceable Through Title V Permit
2. Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Fuel consumption for the steam generator shall not exceed 1,500 MMBtu/day. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Combined quantity of well vent and tank vapor recovery gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 675,000 scf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

Seyed Sadredin, Executive Director / APCO

DAVID WARNER, Director of Permit Services
C-1121-18-24 : May 26 2011 4:23PM – DAVIDSOS : Joint Inspection NOT Required

5. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements of SJVUAPCD Rules 4201 (Amended December 17, 1992), and 4301 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

6. Only natural gas, vapor recovery gas, or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Federally Enforceable Through Title V Permit

7. Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

8. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

9. Emission rates shall not exceed any of the following limits: NOx (as NO2): 15 ppmv @ 3% O2 or 0.018 lb/MMBtu (27.0 lb/day), CO: 43 ppmv @ 3%O2 or 0.032 lb/MMBtu (48.0 lb/day), PM10: 0.0076 lb/MMBtu (11.4 lb-PM10/day), or VOC: 0.008 lb/MMBtu (12.0 lb/day). [District Rule 2201, 4201, 4305, 4306 and 4320] Federally Enforceable Through Title V Permit

10. When fired on PUC quality natural gas, the SOx emissions rate shall not exceed 0.00285 lb/MMBtu. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

11. When fired on gases other than PUC quality natural gas, the SOx emissions rate shall not exceed 9 ppmv @ 3% O2 or 0.015 lb/MMBtu (22.8 lb/day). [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

12. Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201]

13. The sulfur content of treated waste gas exiting the H2S Scavenger System shall be determined on a daily basis by gas detector tube sampling. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

14. The sulfur content of the waste gas exiting the sulfur treatment system shall be tested weekly for sulfur content and higher heating value. If compliance with the sulfur emission limits has been demonstrated for 8 consecutive weeks, then the fuel testing frequency shall be semi-annually. If a semi-annual fuel content source test fails to show compliance, weekly testing shall resume. Testing shall be by grab sample analysis by GC-FPD/TCD or other District approved methods for H2S and mercaptans performed in the laboratory and EPA Method 19. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

15. Daily SOx emissions from combustion of waste gas shall be calculated based on the waste gas sulfur content as determined by gas detector tube sampling or the most recent laboratory analysis, whichever is greater. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

16. When source or type of gas changes, sampling for sulfur content shall be conducted within one week. A change in fuel type is defined as changing between any of the following: PUC-Quality gas, unprocessed field gas, or any field gas with any specific level of pretreatment. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

17. Within 60 days of startup and at least once every 12 months thereafter, unit shall be stack tested to demonstrate compliance with the SOx emission limit required by this permit (ppmv @3 % O2) using EPA Method 6C, Method 8 or ARB Method 100. Stack testing for SOx emissions in not required if unit was fired only on PUC quality natural during the 12 months prior to the compliance testing anniversary date. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

18. If the unit is fired on noncertified gaseous fuel and compliance with SOx emission limits is achieved through fuel sulfur content limitations, then the sulfur content of the gaseous fuel being fired in the unit shall be determined using ASTM D 1072, D 3031, D 4084, D 3246 or grab sample analysis by GC-FPD/TCD performed in the laboratory. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

19. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rules 2520, 9.4.2 and 4305, 6.2.1] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

20. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rule 4305, 5.5.6 and 4306, 5.3] Federally Enforceable Through Title V Permit

21. Subject to the definitions and requirements of Section 5.3, District Rule 4306, emission factor limitations of this permit shall not apply during periods of startup, shutdown, or refractory curing. Duration of startup and shutdown shall not exceed 2 hours each per occurrence. Refractory curing period is defined as a maintenance-based reduced-load period of time during which a unit is brought from a shutdown status to staged rates of firing for the sole purpose of curing new refractory lining in the heat exchanger section of the unit, and shall not exceed 30 hours per occurrence. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

22. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

23. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

24. If either the NOx or CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

25. The permittee shall maintain records of: (1) the date and time of NOx, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NOx and CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

26. Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted at least once every twelve (12) months, (no more than 30 days before or after the required annual source test date). After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months, (no more than 30 days before or after the required 36 months source test date). If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 6.3.1, 4306, 6.3.1, and 4351, 6.3.1]

27. The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

28. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

29. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

30. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

31. The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, NOx (lb/MMBtu) - EPA Method 19, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, stack gas moisture content - EPA Method 4, stack gas velocities - EPA Method 2, and fuel gas sulfur content - ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rules 1081, 4305, 4306, 6.2, and 4351] Federally Enforceable Through Title V Permit

32. NOx, and CO emissions shall be measured with annual source testing conducted by independent testing laboratory with sample collection by ARB certified testing laboratory and shall be witnessed or authorized by the District. [District Rule 1081, 3.0, 4.0 and Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

33. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

34. If the steam generator is fired on PUC-regulated natural gas, then the permittee shall maintain on file copies of all natural gas bills or fuel throughput records for a period of five years. [District Rule2520, 9.3.2]

35. If the steam generator is not fired on PUC-regulated natural gas, then the sulfur content of the non-certified (non PUC/FERC regulated) natural gas being fired in the steam generator shall be determined using ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

36. Compliance with permit conditions in the Title V permit shall be deemed compliance with the requirements of County Rules 108 (Kings), 108.1 (Fresno, Merced, San Joaquin, Tulare, Kern, and Stanislaus), and 110 (Madera), 402 (Madera), 404 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 405 (Madera), 408 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 407.2 (Kern, Tulare, Kings, Stanislaus, and San Joaquin), and 408.2 (Merced). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

37. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements: SJVUAPCD Rules 4201 (Last Amended December 17, 1992), 4301 (Last Amended December 17, 1992), 4406 (Amended December 17, 1992), and 4801 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2]

38. This unit commenced construction, modification, or reconstruction prior to June 19, 1984. This unit has not been used to produce electricity for sale in 1985 or on or after November 15, 1990. Therefore, the requirements of 40 CFR 72.6(b) and 40 CFR 60.40c do not apply to this source. A permit shield is granted from this requirement. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

39. Permittee shall maintain daily record of all natural gas consumption including waste gas consumption, fuel sulfur content, calculated SOx emissions, supplier certifications and test results to show compliance with the conditions of this permit. The operator shall record daily amount and type (s) of fuel(s) combusted and all dates on which unit is fired on any non certified fuel and record specific type(s) of non certified fuel used. [District Rule 1070 and District Rule 2520, section 9.4.2]

40. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, and 4306]

41. ATCs C-1121-18-19, '-18-21, and '-18-22, and will be canceled upon implementation of this ATC. [District Rule 2201] Federally Enforceable Through Title V Permit

42. This ATC shall be implemented concurrent with ATCs C-1121-17-24, '-19-24, '-41-24, and '-168-10 [District Rule] Federally Enforceable Through Title V Permit

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

AUTHORITY TO CONSTRUCT

PERMIT NO: C-1121-19-24 **ISSUANCE DATE:** 05/26/2011

LEGAL OWNER OR OPERATOR: AERA ENERGY LLC
MAILING ADDRESS: 10000 MING AVE
P O BOX 11164
BAKERSFIELD, CA 93389-1164

LOCATION: HEAVY OIL PRODUCTION
FRESNO COUNTY, CA

SECTION: 29 **TOWNSHIP:** 19S **RANGE:** 15E

EQUIPMENT DESCRIPTION:
MODIFICATION OF SG S-11, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER AND A FLUE GAS RECIRCULATION (FGR) SYSTEM SERVED BY LO-COST H2S SCAVENGER SYSTEM SHARED WITH PERMIT UNITS C-1121-17, '-18 AND '-41: INSTALL SULFATREAT VESSELS DOWNSTREAM OF LO-COST SCAVENGING SYSTEM FOR H2S REMOVAL AND LIMIT EXHAUST SOX EMISSIONS TO 9 PPMV @ 3% O2 FOR RULE 4320 COMPLIANCE

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2520] Federally Enforceable Through Title V Permit
2. Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Fuel consumption for the steam generator shall not exceed 1,500 MMBtu/day. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Combined quantity of well vent and tank vapor recovery gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 675,000 scf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

Seyed Sadredin, Executive Director / APCO

DAVID WARNER, Director of Permit Services
C-1121-19-24 : May 26 2011 4:23PM – DAVIDSOS : Joint Inspection NOT Required

5. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements of SJVUAPCD Rules 4201 (Amended December 17, 1992), and 4301 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit
6. Only natural gas, vapor recovery gas, or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Federally Enforceable Through Title V Permit
7. Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Federally Enforceable Through Title V Permit
8. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit
9. Emission rates shall not exceed any of the following limits: NOx (as NO2): 15 ppmv @ 3% O2 or 0.018 lb/MMBtu (27.0 lb/day), CO: 43 ppmv @ 3%O2 or 0.032 lb/MMBtu (48.0 lb/day), PM10: 0.0076 lb/MMBtu (11.4 lb-PM10/day), or VOC: 0.008 lb/MMBtu (12.0 lb/day). [District Rule 2201, 4201, 4305, 4306 and 4320] Federally Enforceable Through Title V Permit
10. When fired on PUC quality natural gas, the SOx emissions rate shall not exceed 0.00285 lb/MMBtu. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit
11. When fired on gases other than PUC quality natural gas, the SOx emissions rate shall not exceed 9 ppmv @ 3% O2 or 0.015 lb/MMBtu (22.8 lb/day). [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit
12. Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201]
13. The sulfur content of treated waste gas exiting the H2S Scavenger System shall be determined on a daily basis by gas detector tube sampling. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
14. The sulfur content of the waste gas exiting the sulfur treatment system shall be tested weekly for sulfur content and higher heating value. If compliance with the sulfur emission limits has been demonstrated for 8 consecutive weeks, then the fuel testing frequency shall be semi-annually. If a semi-annual fuel content source test fails to show compliance, weekly testing shall resume. Testing shall be by grab sample analysis by GC-FPD/TCD or other District approved methods for H2S and mercaptans performed in the laboratory and EPA Method 19. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
15. Daily SOx emissions from combustion of waste gas shall be calculated based on the waste gas sulfur content as determined by gas detector tube sampling or the most recent laboratory analysis, whichever is greater. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit
16. When source or type of gas changes, sampling for sulfur content shall be conducted within one week. A change in fuel type is defined as changing between any of the following: PUC-Quality gas, unprocessed field gas, or any field gas with any specific level of pretreatment. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit
17. Within 60 days of startup and at least once every 12 months thereafter, unit shall be stack tested to demonstrate compliance with the SOx emission limit required by this permit (ppmv @3 % O2) using EPA Method 6C, Method 8 or ARB Method 100. Stack testing for SOx emissions in not required if unit was fired only on PUC quality natural during the 12 months prior to the compliance testing anniversary date. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit
18. If the unit is fired on noncertified gaseous fuel and compliance with SOx emission limits is achieved through fuel sulfur content limitations, then the sulfur content of the gaseous fuel being fired in the unit shall be determined using ASTM D 1072, D 3031, D 4084, D 3246 or grab sample analysis by GC-FPD/TCD performed in the laboratory. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit
19. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rules 2520, 9.4.2 and 4305, 6.2.1] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

20. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rule 4305, 5.5.6 and 4306, 5.3] Federally Enforceable Through Title V Permit

21. Subject to the definitions and requirements of Section 5.3, District Rule 4306, emission factor limitations of this permit shall not apply during periods of startup, shutdown, or refractory curing. Duration of startup and shutdown shall not exceed 2 hours each per occurrence. Refractory curing period is defined as a maintenance-based reduced-load period of time during which a unit is brought from a shutdown status to staged rates of firing for the sole purpose of curing new refractory lining in the heat exchanger section of the unit, and shall not exceed 30 hours per occurrence. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

22. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

23. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

24. If either the NOx or CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

25. The permittee shall maintain records of: (1) the date and time of NOx, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NOx and CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

26. Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted at least once every twelve (12) months, (no more than 30 days before or after the required annual source test date). After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months, (no more than 30 days before or after the required 36 months source test date). If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 6.3.1, 4306, 6.3.1, and 4351, 6.3.1]

27. The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

28. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

29. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

30. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

31. The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, NOx (lb/MMBtu) - EPA Method 19, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, stack gas moisture content - EPA Method 4, stack gas velocities - EPA Method 2, and fuel gas sulfur content - ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rules 1081, 4305, 4306, 6.2, and 4351] Federally Enforceable Through Title V Permit

32. NOx, and CO emissions shall be measured with annual source testing conducted by independent testing laboratory with sample collection by ARB certified testing laboratory and shall be witnessed or authorized by the District. [District Rule 1081, 3.0, 4.0 and Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

33. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

34. If the steam generator is fired on PUC-regulated natural gas, then the permittee shall maintain on file copies of all natural gas bills or fuel throughput records for a period of five years. [District Rule2520, 9.3.2]

35. If the steam generator is not fired on PUC-regulated natural gas, then the sulfur content of the non-certified (non PUC/FERC regulated) natural gas being fired in the steam generator shall be determined using ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

36. Compliance with permit conditions in the Title V permit shall be deemed compliance with the requirements of County Rules 108 (Kings), 108.1 (Fresno, Merced, San Joaquin, Tulare, Kern, and Stanislaus), and 110 (Madera), 402 (Madera), 404 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 405 (Madera), 408 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 407.2 (Kern, Tulare, Kings, Stanislaus, and San Joaquin), and 408.2 (Merced). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

37. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements: SJVUAPCD Rules 4201 (Last Amended December 17, 1992), 4301 (Last Amended December 17, 1992), 4406 (Amended December 17, 1992), and 4801 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2]

38. This unit commenced construction, modification, or reconstruction prior to June 19, 1984. This unit has not been used to produce electricity for sale in 1985 or on or after November 15, 1990. Therefore, the requirements of 40 CFR 72.6(b) and 40 CFR 60.40c do not apply to this source. A permit shield is granted from this requirement. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

39. Permittee shall maintain daily record of all natural gas consumption including waste gas consumption, fuel sulfur content, calculated SOx emissions, supplier certifications and test results to show compliance with the conditions of this permit. The operator shall record daily amount and type (s) of fuel(s) combusted and all dates on which unit is fired on any non certified fuel and record specific type(s) of non certified fuel used. [District Rule 1070 and District Rule 2520, section 9.4.2]

40. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, and 4306]

41. ATCs : C-1121-19-19, '-19-21, '-19-2, and '-19-23 shall be canceled upon implementation of this ATC. [District Rule 2201] Federally Enforceable Through Title V Permit

42. This ATC shall be implemented concurrent with ATCs C-1121-17-24, '-18-24, '-41-24, and '-168-10 [District Rule] Federally Enforceable Through Title V Permit

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

AUTHORITY TO CONSTRUCT

PERMIT NO: C-1121-168-10 **ISSUANCE DATE:** 05/26/2011

LEGAL OWNER OR OPERATOR: AERA ENERGY LLC
MAILING ADDRESS: 10000 MING AVE
P O BOX 11164
BAKERSFIELD, CA 93389-1164

LOCATION: HEAVY OIL PRODUCTION
FRESNO COUNTY, CA

EQUIPMENT DESCRIPTION:
MODIFICATION OF DORMANT 7.16 MMBTU/HR FLARE WITH H2S SCAVENGER SYSTEM TO BE USED TO INCINERATE NATURAL, WELL CASING, AND VAPOR RECOVERY GAS DURING MAINTENANCE OF FOUR 62.5 MMBTU/HR STEAM GENERATORS (C-1121-17, -18, -19, AND -41): LOWER ANNUAL SOX LIMIT SHARED WITH STEAM GENERATORS C-1121-17, -18, -19, AND -41 TO 28,580 LB/YR

CONDITIONS

1. No modification to this unit shall be performed without an Authority to Construct for such modification(s), except for changes specified in conditions below. [District Rule 2010] Federally Enforceable Through Title V Permit
2. This equipment shall not be operated for any reason until an Authority to Construct permit is issued approving all necessary retrofits required to comply with the applicable requirements of District Rule 4311. [District Rule 4311] Federally Enforceable Through Title V Permit
3. The operator shall permanently disconnect the fuel supply line serving this unit. [District Rule 4311] Federally Enforceable Through Title V Permit
4. All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District NSR Rule] Federally Enforceable Through Title V Permit
5. Only PUC-quality natural gas or a combination of natural gas and vapor recovery gas shall be used as fuel. [District NSR Rule] Federally Enforceable Through Title V Permit
6. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

Seyed Sadredin, Executive Director / APCO

DAVID WARNER, Director of Permit Services
C-1121-168-10 : May 26 2011 4:23PM – DAVIDSOB : Joint Inspection NOT Required

7. Fuel consumption for the flare shall not exceed 1.35 MMscf/day. [District NSR Rule] Federally Enforceable Through Title V Permit

8. Combined exhaust gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 675,000 scf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

9. Emissions from the flare shall not exceed any of the following limits: 48.1 lb-PM10/day, 571.6 lb-SOx/day calculated as SO2; 91.8 lb-NOx/day calculated as NO2, 85.1 lb-VOC/day, or 499.5 lb-CO/day. [District NSR Rules, Rule 4201, 3.1 & Rule 4301, 5.1, 5.2] Federally Enforceable Through Title V Permit

10. When fired only on natural gas, emissions from the flare shall not exceed any of the following limits: 0.008 lb-PM10/MMBtu calculated to 12% CO2; 0.00285 lb-SOx/MMBtu calculated as SO2; 0.068 lb-NOx/MMBtu calculated as NO2 @ 3% O2 or 30 ppmv @ 3% O2; 0.063 lb-VOC/MMBtu, or 0.37 lb-CO/MMBtu @ 3% O2. [District NSR Rules, Rule 4201, 3.1 & Rule 4301, 5.1, 5.2] Federally Enforceable Through Title V Permit

11. When fired only on waste gas, emissions from the flare shall not exceed any of the following limits: 0.633 lb-PM10/MMBtu calculated to 12% CO2; 8.44 lb-SOx/MMBtu calculated as SO2; 0.068 lb-NOx/MMBtu calculated as NO2 @ 3% O2 or 30 ppmv @ 3% O2; 0.063 lb-VOC/MMBtu, or 0.37 lb-CO/MMBtu @ 3% O2. [District NSR Rules, Rule 4201, 3.1 & Rule 4301, 5.1, 5.2] Federally Enforceable Through Title V Permit

12. Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201] Federally Enforceable Through Title V Permit

13. The sulfur content of treated waste gas exiting the H2S Scavenger System shall not exceed 5000 ppmv. Sulfur content shall be determined on a daily basis by gas detector tube sampling. [District NSR Rule] Federally Enforceable Through Title V Permit

14. Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

15. Operation of this flare shall only occur when steam generators C-1121-17, -18,-19, and -41 are all shut down due to maintenance. [District Rule 2201] Federally Enforceable Through Title V Permit

16. The flame shall be present at all times when combustible gases are vented through the flare. [District Rule 4311] Federally Enforceable Through Title V Permit

17. The outlet shall be equipped with an automatic ignition system, or, shall operate with a pilot flame present at all times when combustible gases are vented through the flare, except during purge periods for automatic-ignition equipped flares. [District Rule 4311] Federally Enforceable Through Title V Permit

18. Except for flares equipped with a flow-sensing ignition system, a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting at least one pilot flame or the flare flame is present shall be installed and operated. Flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot shall use purge gas for purging. [District Rule 4311] Federally Enforceable Through Title V Permit

19. Flare gas pressure shall be greater than or equal to 5 psig. [District Rule 2201] Federally Enforceable Through Title V Permit

20. Gas line to flare shall be equipped with operational, volumetric flow rate indicator. [District Rule 2201] Federally Enforceable Through Title V Permit

21. Operation of the flare shall not exceed 48 hours per calendar quarter or 192 hours per calendar year. [District Rule 2201] Federally Enforceable Through Title V Permit

22. Records of operating hours and gas volume flared shall be maintained, retained on the premises for at least five years, and be made available for District inspection on request. [District Rule 2201] Federally Enforceable Through Title V Permit

23. This ATC shall be implemented concurrent with ATCs C-1121-17-24, '-18-24, '-19-24, and '-41-24. [District Rule] Federally Enforceable Through Title V Permit

Appendix B
QNEC Calculations

Quarterly Net Emissions Change (QNEC)

The QNEC is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

NEC = PE2 - BE, where:

NEC = Quarterly Net Emissions Change
PE2 = Post Project Potential to Emit for all units
BE = Baseline Emissions (per Rule 2201).

Using the quarterly values calculated in Sections VII.C.2 and VII.C.6 and the evaluation above, quarterly NEC can be calculated as follows:

Quarterly NEC (Steam Generator)			
	PE_2 lb/qtr	BE lb/qtr	NEC lb/qtr
NO_x	2,321	2,457	-136
SO_x	2,075	2,075	0
PM_{10}	1,037	1,037	0
CO	4,369	4,369	0
VOC	1,092	1,092	0

Quarterly NEC (Flare)			
	PE_2 lb/qtr	BE lb/qtr	NEC lb/qtr
NO_x	101	101	0
SO_x	861	452	0*
PM_{10}	12	12	0
CO	550	550	0
VOC	94	94	0

* An SLC limits Annual SOx emissions to 28,580 lb/year, therefore, the quarterly NEC is considered to be zero for the units operating under the SLC.

Appendix C
Flare SOx Emission Factor Derivation

Derivation of Flare Vapor Recovery Gas Sulfur Emission Factor
Using Mass Balance

A. Assumptions

- 7.16 MMBtu/hr maximum design rating
- Operating schedule: 24 hours/day (per applicant)
  192 hours/year (equivalent to 8 day/year)
  48 hours/quarter (equivalent to 2 day/qtr)
- Pre-Project:
  - Total fuel gas combustion: 1.35 MMscf/day (per current permit)
  - Maximum waste gas combustion: 675,000 scf/day (per current permit)
  - Maximum influent waste gas H_2S concentration: 5,000 ppmvd (per current permit)
- Post-Project
  - Total fuel gas combustion: 1.35 MMscf/day (per applicant)
  - Maximum waste gas combustion: 1,350,000 scf/day (per applicant)
  - Maximum influent waste gas H_2S concentration: 2,500 ppmvd (per applicant, to prevent an increase in sulfur emissions)
- Recovery gas F-factor (60 °F): 13,629 dscf/MMBtu (per applicant)
- Natural gas F-factor (60 °F) 8,578 dscf/MMBtu
- Molar Specific Volume (60 °F): 379.5 ft^3/lb-mol
- Molecular Weight of H_2S: 34 lb/lb-mol
- Molecular Weight of S: 32 lb/lb-mol
- Molecular Weight of SO_2: 64 lb/lb-mol
- Heat Content of Natural Gas = 1,000 Btu/scf
- Heat Content of Recovery Gas = 100 Btu/scf (per applicant)

B. Emission Factors (EFs)

1. Pre-Project Emission Factors:

The pre-project emission factors for natural gas were obtained from the current permit.

Pre-Project Emission Factors (lb/MMBtu)					
Pollutant	NOx	SOx	PM_{10}	CO	VOC
SG Natural Gas	0.018	0.00285	0.0076	0.032	0.008
SG Recovery Gas	0.018	0.015	0.0076	0.032	0.008
Flare Natural Gas	0.068	0.00285	0.008	0.37	0.063
Flare Recovery Gas	0.068	8.44	0.008	0.37	0.063

Per District Policy APR 1110 (Use of Revised EFs), the SO_X EF for recovery gas will be re-established based on the sulfur content, and is calculated using the following formula:

$$EF_{SO_X} = \frac{\left(468.75\frac{ft^3-fuel}{min}\right)\left(60\frac{min}{hr}\right)\left(5{,}000\frac{ft^3-H_2S}{10^6\ ft^3-fuel}\right)\left(34\frac{lb-H_2S}{lb-mol}\right)}{\left(\frac{379.5\ ft^3-H_2S}{lb-mol}\right)\left(\frac{34\ lb-H_2S}{32\ lb-S}\right)\left(\frac{32\ lb-S}{64\ lb-SO_2}\right)}$$

$$= \quad 23.72\frac{lb-SO_2}{hr} \text{ or } 23.72\frac{lb-SO_x}{hr}$$

The flare also burns natural gas, which has an emission factor of 0.00285 lb SOx per MMBtu. When the running currently permitted maximum vapor recovery gas allowable in a day (675,000 scf/day) through the flare and running the remaining allowable fuel limit (0.675 MMBtu/day), as natural gas, through the flare. The remaining natural gas amount is calculated as

Natural Gas burned = (1.35 MMscf – 0.675 MMscf)
= 0.675 MMscf

$SOx_{Natural\ Gas}$ = 0.00285 (lb/MMBtu) x 1000 (Btu/scf) x .675(MMscf/day) /24 hr/day
= 0.080 (lb/hr)

Combining the emissions from the vapor recovery gas and natural gas produces the total flare emissions:

Total SOx = (23.72 + 0.08) lb/hr
= 23.80 lb/hr

Applying the maximum design flare tip rating of the enclosed ground-level flare's burner, the waste gas mass rate emission of SO_X can be converted into EF (lb-SO_X/MMBtu)

EF_{SOx} = (23.80 lb-SO_X/hr) ÷ (7.16 MMBtu/hr) = **3.32 lb-SO_X/MMBtu**

The previous PM_{10} emission factor for recovery gas was based on FYI-83 (Use of AP-42 EF for Flares).

Revised Pre-Project Emission Factors for Flare Combustion		
Recovery Gas		
Pollutant	EF (lb/MMBtu)	Source
NO_X	0.068	per current permit
SO_X	3.32	Mass Balance (Gas Analysis)
PM_{10}	0.008	FYI-83 (Use of AP-42 EF for Flares)
CO	0.37	per current permit
VOC	0.063	per current permit

2. Post-Project Emission Factors:

The applicant is proposing to maintain sulfur emissions at their current level, despite the doubling the vapor recovery fuel consumption. This will be accomplished by increasing the sulfur removal to reduce the sulfur content by 50%. Applying these new factors to the previous equation produces the following result.

$$EF_{SO_X} = \frac{\left(937.5\frac{ft^3-fuel}{min}\right)\left(60\frac{min}{hr}\right)\left(2{,}500\frac{ft^3-H_2S}{10^6\,ft^3-fuel}\right)\left(34\frac{lb-H_2S}{lb-mol}\right)}{\left(\frac{379.5\,ft^3-H_2S}{lb-mol}\right)\left(\frac{34\,lb-H_2S}{32\,lb-S}\right)\left(\frac{32\,lb-S}{64\,lb-SO_2}\right)}$$

$$= \quad 23.72\frac{lb-SO_2}{hr} \;\; or \;\; 23.72\frac{lb-SO_X}{hr}$$

Since the applicant is proposing that natural gas could be burned at the maximum vapor recovery gas level, the calculated number represents the maximum emission rate.

Applying the maximum design flare tip rating of the enclosed ground-level flare's burner, the waste gas mass rate emission of SO_X can be converted into EF (lb-SO_X/MMBtu)

EF_{SOx} = (23.72 lb-SO_X/hr) ÷ (7.16 MMBtu/hr) = **3.31 lb-SO_X/MMBtu**

Post-Project Emission Factors for Flare Combustion		
Recovery Gas		
Pollutant	EF (lb/MMBtu)	Source
NO_X	0.068	per current permit
SO_X	3.31	Mass Balance (Gas Analysis)
PM_{10}	0.008	FYI-83 (Use of AP-42 EF for Flares)
CO	0.37	per current permit
VOC	0.063	per current permit

Appendix D
Draft ATCs
And Emission Profiles

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: C-1121-17-26 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: AERA ENERGY LLC
MAILING ADDRESS: 10000 MING AVE
P O BOX 11164
BAKERSFIELD, CA 93389-1164

LOCATION: HEAVY OIL PRODUCTION
FRESNO COUNTY, CA

SECTION: 26 **TOWNSHIP:** 19S **RANGE:** 15E

EQUIPMENT DESCRIPTION:
MODIFICATION OF S-9, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH COEN QLN ULN BURNER AND FLUE GAS RECIRCULATION SERVED BY LO-COST H2S SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C-1121-18, '-19 AND '-41: INCREASE THE VAPOR RECOVERY GAS LIMIT FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY AND LIMIT NOX EMISSIONS TO 14 PPMV @ 3% O2

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Fuel consumption for the steam generator shall not exceed 1,500 MMBtu/day. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Combined quantity of well vent and tank vapor recovery gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 1,300,000 scf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

Seyed Sadredin, Executive Director / APCO

DRAFT

DAVID WARNER, Director of Permit Services
C-1121-17-26 : Feb 25 2013 10:53AM – HEINENG : Joint Inspection NOT Required

5. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements of SJVUAPCD Rules 4201 (Amended December 17, 1992), and 4301 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

6. Only natural gas, vapor recovery gas, or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Federally Enforceable Through Title V Permit

7. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]

8. Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

9. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

10. Emission rates shall not exceed any of the following limits: NOx (as NO2): 14 ppmv @ 3% O2 or 0.017 lb/MMBtu (25.5 lb/day), CO: 43 ppmv @ 3%O2 or 0.032 lb/MMBtu (48.0 lb/day), PM10: 0.0076 lb/MMBtu (11.4 lb-PM10/day), or VOC: 0.008 lb/MMBtu (12.0 lb/day). [District Rule 2201, 4201, 4305, 4306 and 4320] Federally Enforceable Through Title V Permit

11. When fired on PUC quality natural gas, the SOx emissions rate shall not exceed 0.00285 lb/MMBtu. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

12. When fired on gases other than PUC quality natural gas, the SOx emissions rate shall not exceed 9 ppmv @ 3% O2 or 0.015 lb/MMBtu (22.8 lb/day). [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

13. Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201]

14. The sulfur content of treated waste gas exiting the H2S Scavenger System shall be determined on a daily basis by gas detector tube sampling. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

15. The sulfur content of the waste gas exiting the sulfur treatment system shall be tested weekly for sulfur content and higher heating value. If compliance with the sulfur emission limits has been demonstrated for 8 consecutive weeks, then the fuel testing frequency shall be semi-annually. If a semi-annual fuel content source test fails to show compliance, weekly testing shall resume. Testing shall be by grab sample analysis by GC-FPD/TCD or other District approved methods for H2S and mercaptans performed in the laboratory and EPA Method 19. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

16. Daily SOx emissions from combustion of waste gas shall be calculated based on the waste gas sulfur content as determined by gas detector tube sampling or the most recent laboratory analysis, whichever is greater. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

17. When source or type of gas changes, sampling for sulfur content shall be conducted within one week. A change in fuel type is defined as changing between any of the following: PUC-Quality gas, unprocessed field gas, or any field gas with any specific level of pretreatment. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

18. At least once every 12 months, unit shall be stack tested to demonstrate compliance with the SOx emission limit required by this permit (ppmv @3 % O2) using EPA Method 6C, Method 8 or ARB Method 100. Stack testing for SOx emissions in not required if unit was fired only on PUC quality natural during the 12 months prior to the compliance testing anniversary date. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

19. If the unit is fired on noncertified gaseous fuel and compliance with SOx emission limits is achieved through fuel sulfur content limitations, then the sulfur content of the gaseous fuel being fired in the unit shall be determined using ASTM D 1072, D 3031, D 4084, D 3246 or grab sample analysis by GC-FPD/TCD performed in the laboratory. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

20. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rules 2520, 9.4.2 and 4305, 6.2.1] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

21. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rule 4305, 5.5.6 and 4306, 5.3] Federally Enforceable Through Title V Permit

22. Subject to the definitions and requirements of Section 5.3, District Rule 4306, emission factor limitations of this permit shall not apply during periods of startup, shutdown, or refractory curing. Duration of startup and shutdown shall not exceed 2 hours each per occurrence. Refractory curing period is defined as a maintenance-based reduced-load period of time during which a unit is brought from a shutdown status to staged rates of firing for the sole purpose of curing new refractory lining in the heat exchanger section of the unit, and shall not exceed 30 hours per occurrence. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

23. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

24. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

25. If either the NOx or CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

26. The permittee shall maintain records of: (1) the date and time of NOx, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NOx and CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

27. Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted at least once every twelve (12) months, (no more than 30 days before or after the required annual source test date). After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months, (no more than 30 days before or after the required 36 months source test date). If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 6.3.1, 4306, 6.3.1, and 4351, 6.3.1]

28. The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

29. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

30. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

31. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

32. The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, NOx (lb/MMBtu) - EPA Method 19, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, stack gas moisture content - EPA Method 4, stack gas velocities - EPA Method 2, and fuel gas sulfur content - ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rules 1081, 4305, 4306, 6.2, and 4351] Federally Enforceable Through Title V Permit

33. NOx, and CO emissions shall be measured with annual source testing conducted by independent testing laboratory with sample collection by ARB certified testing laboratory and shall be witnessed or authorized by the District. [District Rule 1081, 3.0, 4.0 and Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

34. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

35. If the steam generator is fired on PUC-regulated natural gas, then the permittee shall maintain on file copies of all natural gas bills or fuel throughput records for a period of five years. [District Rule2520, 9.3.2]

36. If the steam generator is not fired on PUC-regulated natural gas, then the sulfur content of the non-certified (non PUC/FERC regulated) natural gas being fired in the steam generator shall be determined using ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

37. Compliance with permit conditions in the Title V permit shall be deemed compliance with the requirements of County Rules 108 (Kings), 108.1 (Fresno, Merced, San Joaquin, Tulare, Kern, and Stanislaus), and 110 (Madera), 402 (Madera), 404 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 405 (Madera), 408 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 407.2 (Kern, Tulare, Kings, Stanislaus, and San Joaquin), and 408.2 (Merced). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

38. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements: SJVUAPCD Rules 4201 (Last Amended December 17, 1992), 4301 (Last Amended December 17, 1992), 4406 (Amended December 17, 1992), and 4801 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2]

39. This unit commenced construction, modification, or reconstruction prior to June 19, 1984. This unit has not been used to produce electricity for sale in 1985 or on or after November 15, 1990. Therefore, the requirements of 40 CFR 72.6(b) and 40 CFR 60.40c do not apply to this source. A permit shield is granted from this requirement. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

40. Permittee shall maintain daily record of all natural gas consumption including waste gas consumption, fuel sulfur content, calculated SOx emissions, supplier certifications and test results to show compliance with the conditions of this permit. The operator shall record daily amount and type (s) of fuel(s) combusted and all dates on which unit is fired on any non certified fuel and record specific type(s) of non certified fuel used. [District Rule 1070 and District Rule 2520, section 9.4.2]

41. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, and 4306]

42. ATC C-1121-17-25 shall be canceled upon implementation of this ATC. [District Rule 2201] Federally Enforceable Through Title V Permit

43. This ATC shall be implemented concurrent with ATCs C-1121-18-26, -19-26, -41-26, and -168-11. [District Rule] Federally Enforceable Through Title V Permit

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: C-1121-18-26 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: AERA ENERGY LLC
MAILING ADDRESS: 10000 MING AVE
P O BOX 11164
BAKERSFIELD, CA 93389-1164

LOCATION: HEAVY OIL PRODUCTION
FRESNO COUNTY, CA

SECTION: 29 **TOWNSHIP:** 19S **RANGE:** 15E

EQUIPMENT DESCRIPTION:
MODIFICATION OF S-10, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER, AND A FLUE GAS RECIRCULATION (FOR) SYSTEM SERVED BY LO-COST H2S SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C-1121-17, '-19 AND '-41: INCREASE THE VAPOR RECOVERY GAS LIMIT FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY AND LIMIT NOX EMISSIONS TO 14 PPMV @ 3% O2

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Fuel consumption for the steam generator shall not exceed 1,500 MMBtu/day. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Combined quantity of well vent and tank vapor recovery gases combusted within steam generators -17, -18, -19, and -41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 1,300,000 scf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

Seyed Sadredin, Executive Director / APCO

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DAVID WARNER, Director of Permit Services
C-1121-18-26 : Feb 25 2013 10:53AM – HEINENG : Joint Inspection NOT Required

5. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements of SJVUAPCD Rules 4201 (Amended December 17, 1992), and 4301 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

6. Only natural gas, vapor recovery gas, or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Federally Enforceable Through Title V Permit

7. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]

8. Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

9. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

10. Emission rates shall not exceed any of the following limits: NOx (as NO2): 14 ppmv @ 3% O2 or 0.017 lb/MMBtu (25.5 lb/day), CO: 43 ppmv @ 3%O2 or 0.032 lb/MMBtu (48.0 lb/day), PM10: 0.0076 lb/MMBtu (11.4 lb-PM10/day), or VOC: 0.008 lb/MMBtu (12.0 lb/day). [District Rule 2201, 4201, 4305, 4306 and 4320] Federally Enforceable Through Title V Permit

11. When fired on PUC quality natural gas, the SOx emissions rate shall not exceed 0.00285 lb/MMBtu. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

12. When fired on gases other than PUC quality natural gas, the SOx emissions rate shall not exceed 9 ppmv @ 3% O2 or 0.015 lb/MMBtu (22.8 lb/day). [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

13. Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201]

14. The sulfur content of treated waste gas exiting the H2S Scavenger System shall be determined on a daily basis by gas detector tube sampling. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

15. The sulfur content of the waste gas exiting the sulfur treatment system shall be tested weekly for sulfur content and higher heating value. If compliance with the sulfur emission limits has been demonstrated for 8 consecutive weeks, then the fuel testing frequency shall be semi-annually. If a semi-annual fuel content source test fails to show compliance, weekly testing shall resume. Testing shall be by grab sample analysis by GC-FPD/TCD or other District approved methods for H2S and mercaptans performed in the laboratory and EPA Method 19. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

16. Daily SOx emissions from combustion of waste gas shall be calculated based on the waste gas sulfur content as determined by gas detector tube sampling or the most recent laboratory analysis, whichever is greater. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

17. When source or type of gas changes, sampling for sulfur content shall be conducted within one week. A change in fuel type is defined as changing between any of the following: PUC-Quality gas, unprocessed field gas, or any field gas with any specific level of pretreatment. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

18. At least once every 12 months, unit shall be stack tested to demonstrate compliance with the SOx emission limit required by this permit (ppmv @3 % O2) using EPA Method 6C, Method 8 or ARB Method 100. Stack testing for SOx emissions in not required if unit was fired only on PUC quality natural during the 12 months prior to the compliance testing anniversary date. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

19. If the unit is fired on noncertified gaseous fuel and compliance with SOx emission limits is achieved through fuel sulfur content limitations, then the sulfur content of the gaseous fuel being fired in the unit shall be determined using ASTM D 1072, D 3031, D 4084, D 3246 or grab sample analysis by GC-FPD/TCD performed in the laboratory. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

20. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rules 2520, 9.4.2 and 4305, 6.2.1] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

21. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rule 4305, 5.5.6 and 4306, 5.3] Federally Enforceable Through Title V Permit

22. Subject to the definitions and requirements of Section 5.3, District Rule 4306, emission factor limitations of this permit shall not apply during periods of startup, shutdown, or refractory curing. Duration of startup and shutdown shall not exceed 2 hours each per occurrence. Refractory curing period is defined as a maintenance-based reduced-load period of time during which a unit is brought from a shutdown status to staged rates of firing for the sole purpose of curing new refractory lining in the heat exchanger section of the unit, and shall not exceed 30 hours per occurrence. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

23. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

24. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

25. If either the NOx or CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

26. The permittee shall maintain records of: (1) the date and time of NOx, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NOx and CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

27. Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted at least once every twelve (12) months, (no more than 30 days before or after the required annual source test date). After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months, (no more than 30 days before or after the required 36 months source test date). If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 6.3.1, 4306, 6.3.1, and 4351, 6.3.1]

28. The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

29. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

30. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

31. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

32. The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, NOx (lb/MMBtu) - EPA Method 19, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, stack gas moisture content - EPA Method 4, stack gas velocities - EPA Method 2, and fuel gas sulfur content - ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rules 1081, 4305, 4306, 6.2, and 4351] Federally Enforceable Through Title V Permit

33. NOx, and CO emissions shall be measured with annual source testing conducted by independent testing laboratory with sample collection by ARB certified testing laboratory and shall be witnessed or authorized by the District. [District Rule 1081, 3.0, 4.0 and Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

34. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

35. If the steam generator is fired on PUC-regulated natural gas, then the permittee shall maintain on file copies of all natural gas bills or fuel throughput records for a period of five years. [District Rule2520, 9.3.2]

36. If the steam generator is not fired on PUC-regulated natural gas, then the sulfur content of the non-certified (non PUC/FERC regulated) natural gas being fired in the steam generator shall be determined using ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

37. Compliance with permit conditions in the Title V permit shall be deemed compliance with the requirements of County Rules 108 (Kings), 108.1 (Fresno, Merced, San Joaquin, Tulare, Kern, and Stanislaus), and 110 (Madera), 402 (Madera), 404 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 405 (Madera), 408 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 407.2 (Kern, Tulare, Kings, Stanislaus, and San Joaquin), and 408.2 (Merced). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

38. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements: SJVUAPCD Rules 4201 (Last Amended December 17, 1992), 4301 (Last Amended December 17, 1992), 4406 (Amended December 17, 1992), and 4801 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2]

39. This unit commenced construction, modification, or reconstruction prior to June 19, 1984. This unit has not been used to produce electricity for sale in 1985 or on or after November 15, 1990. Therefore, the requirements of 40 CFR 72.6(b) and 40 CFR 60.40c do not apply to this source. A permit shield is granted from this requirement. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

40. Permittee shall maintain daily record of all natural gas consumption including waste gas consumption, fuel sulfur content, calculated SOx emissions, supplier certifications and test results to show compliance with the conditions of this permit. The operator shall record daily amount and type (s) of fuel(s) combusted and all dates on which unit is fired on any non certified fuel and record specific type(s) of non certified fuel used. [District Rule 1070 and District Rule 2520, section 9.4.2]

41. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, and 4306]

42. ATC C-1121-18-25 shall be canceled upon implementation of this ATC. [District Rule 2201] Federally Enforceable Through Title V Permit

43. This ATC shall be implemented concurrent with ATCs C-1121-17-26, -19-26, -41-26, and -168-10 [District Rule 2201] Federally Enforceable Through Title V Permit

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: C-1121-19-26 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: AERA ENERGY LLC
MAILING ADDRESS: 10000 MING AVE
P O BOX 11164
BAKERSFIELD, CA 93389-1164

LOCATION: HEAVY OIL PRODUCTION
FRESNO COUNTY, CA

SECTION: 29 **TOWNSHIP:** 19S **RANGE:** 15E

EQUIPMENT DESCRIPTION:
MODIFICATION OF S-11, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR WITH A COEN QLN-ULN LOW NOX BURNER AND A FLUE GAS RECIRCULATION (FGR) SYSTEM SERVED BY LO-COST H2S . SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C-1121-17, '-18 AND '-41: INCREASE THE VAPOR RECOVERY GAS LIMIT FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY AND LIMIT NOX EMISSIONS TO 14 PPMV @ 3% O2

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Fuel consumption for the steam generator shall not exceed 1,500 MMBtu/day. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Combined quantity of well vent and tank vapor recovery gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 1,300,000 scf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

Seyed Sadredin, Executive Director / APCO

DRAFT

DAVID WARNER, Director of Permit Services
C-1121-19-26 , Feb 25 2013 10:53AM – HEINENG : Joint Inspection NOT Required

5. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements of SJVUAPCD Rules 4201 (Amended December 17, 1992), and 4301 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

6. Only natural gas, vapor recovery gas, or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Federally Enforceable Through Title V Permit

7. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]

8. Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

9. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

10. Emission rates shall not exceed any of the following limits: NOx (as NO2): 14 ppmv @ 3% O2 or 0.017 lb/MMBtu (25.5 lb/day), CO: 43 ppmv @ 3% O2 or 0.032 lb/MMBtu (48.0 lb/day), PM10: 0.0076 lb/MMBtu (11.4 lb-PM10/day), or VOC: 0.008 lb/MMBtu (12.0 lb/day). [District Rule 2201, 4201, 4305, 4306 and 4320] Federally Enforceable Through Title V Permit

11. When fired on PUC quality natural gas, the SOx emissions rate shall not exceed 0.00285 lb/MMBtu. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

12. When fired on gases other than PUC quality natural gas, the SOx emissions rate shall not exceed 9 ppmv @ 3% O2 or 0.015 lb/MMBtu (22.8 lb/day). [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

13. Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201]

14. The sulfur content of treated waste gas exiting the H2S Scavenger System shall be determined on a daily basis by gas detector tube sampling. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

15. The sulfur content of the waste gas exiting the sulfur treatment system shall be tested weekly for sulfur content and higher heating value. If compliance with the sulfur emission limits has been demonstrated for 8 consecutive weeks, then the fuel testing frequency shall be semi-annually. If a semi-annual fuel content source test fails to show compliance, weekly testing shall resume. Testing shall be by grab sample analysis by GC-FPD/TCD or other District approved methods for H2S and mercaptans performed in the laboratory and EPA Method 19. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

16. Daily SOx emissions from combustion of waste gas shall be calculated based on the waste gas sulfur content as determined by gas detector tube sampling or the most recent laboratory analysis, whichever is greater. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

17. When source or type of gas changes, sampling for sulfur content shall be conducted within one week. A change in fuel type is defined as changing between any of the following: PUC-Quality gas, unprocessed field gas, or any field gas with any specific level of pretreatment. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

18. At least once every 12 months, unit shall be stack tested to demonstrate compliance with the SOx emission limit required by this permit (ppmv @3 % O2) using EPA Method 6C, Method 8 or ARB Method 100. Stack testing for SOx emissions in not required if unit was fired only on PUC quality natural during the 12 months prior to the compliance testing anniversary date. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

19. If the unit is fired on noncertified gaseous fuel and compliance with SOx emission limits is achieved through fuel sulfur content limitations, then the sulfur content of the gaseous fuel being fired in the unit shall be determined using ASTM D 1072, D 3031, D 4084, D 3246 or grab sample analysis by GC-FPD/TCD performed in the laboratory. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

20. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rules 2520, 9.4.2 and 4305, 6.2.1] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

21. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rule 4305, 5.5.6 and 4306, 5.3] Federally Enforceable Through Title V Permit

22. Subject to the definitions and requirements of Section 5.3, District Rule 4306, emission factor limitations of this permit shall not apply during periods of startup, shutdown, or refractory curing. Duration of startup and shutdown shall not exceed 2 hours each per occurrence. Refractory curing period is defined as a maintenance-based reduced-load period of time during which a unit is brought from a shutdown status to staged rates of firing for the sole purpose of curing new refractory lining in the heat exchanger section of the unit, and shall not exceed 30 hours per occurrence. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

23. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

24. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

25. If either the NOx or CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

26. The permittee shall maintain records of: (1) the date and time of NOx, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NOx and CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

27. Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted at least once every twelve (12) months, (no more than 30 days before or after the required annual source test date). After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months, (no more than 30 days before or after the required 36 months source test date). If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 6.3.1, 4306, 6.3.1, and 4351, 6.3.1]

28. The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

29. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

30. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

31. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

32. The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, NOx (lb/MMBtu) - EPA Method 19, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, stack gas moisture content - EPA Method 4, stack gas velocities - EPA Method 2, and fuel gas sulfur content - ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rules 1081, 4305, 4306, 6.2, and 4351] Federally Enforceable Through Title V Permit

33. NOx, and CO emissions shall be measured with annual source testing conducted by independent testing laboratory with sample collection by ARB certified testing laboratory and shall be witnessed or authorized by the District. [District Rule 1081, 3.0, 4.0 and Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

34. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

35. If the steam generator is fired on PUC-regulated natural gas, then the permittee shall maintain on file copies of all natural gas bills or fuel throughput records for a period of five years. [District Rule2520, 9.3.2]

36. If the steam generator is not fired on PUC-regulated natural gas, then the sulfur content of the non-certified (non PUC/FERC regulated) natural gas being fired in the steam generator shall be determined using ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

37. Compliance with permit conditions in the Title V permit shall be deemed compliance with the requirements of County Rules 108 (Kings), 108.1 (Fresno, Merced, San Joaquin, Tulare, Kern, and Stanislaus), and 110 (Madera), 402 (Madera), 404 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 405 (Madera), 408 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 407.2 (Kern, Tulare, Kings, Stanislaus, and San Joaquin), and 408.2 (Merced). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

38. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements: SJVUAPCD Rules 4201 (Last Amended December 17, 1992), 4301 (Last Amended December 17, 1992), 4406 (Amended December 17, 1992), and 4801 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2]

39. This unit commenced construction, modification, or reconstruction prior to June 19, 1984. This unit has not been used to produce electricity for sale in 1985 or on or after November 15, 1990. Therefore, the requirements of 40 CFR 72.6(b) and 40 CFR 60.40c do not apply to this source. A permit shield is granted from this requirement. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

40. Permittee shall maintain daily record of all natural gas consumption including waste gas consumption, fuel sulfur content, calculated SOx emissions, supplier certifications and test results to show compliance with the conditions of this permit. The operator shall record daily amount and type (s) of fuel(s) combusted and all dates on which unit is fired on any non certified fuel and record specific type(s) of non certified fuel used. [District Rule 1070 and District Rule 2520, section 9.4.2]

41. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, and 4306]

42. ATCs C-1121-19-25 shall be canceled upon implementation of this ATC. [District Rule 2201] Federally Enforceable Through Title V Permit

43. This ATC shall be implemented concurrent with ATCs C-1121-17-26, -18-26, -41-26, and -168-11 [District Rule 2201] Federally Enforceable Through Title V Permit

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: C-1121-41-26 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: AERA ENERGY LLC
MAILING ADDRESS: 10000 MING AVE
P O BOX 11164
BAKERSFIELD, CA 93389-1164

LOCATION: HEAVY OIL PRODUCTION
FRESNO COUNTY, CA

SECTION: 29 **TOWNSHIP:** 19S **RANGE:** 15E

EQUIPMENT DESCRIPTION:
MODIFICATION OF S-12, 62.5 MMBTU/HR THERMOTICS, NATURAL GAS/VAPOR RECOVERY GAS-FIRED STEAM GENERATOR (S-12) WITH COEN QLN-ULN BURNER, FLUE GAS RECIRCULATION SERVED BY LO-COST H2S SCAVENGER SYSTEM AND SULFATREAT VESSELS SHARED WITH PERMIT UNITS C- 1121-17, '-18 AND '-19: INCREASE THE VAPOR RECOVERY GAS LIMIT FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY AND LIMIT NOX EMISSIONS TO 14 PPMV @ 3% O2

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Fuel consumption for the steam generator shall not exceed 1,500 MMBtu/day. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Combined quantity of well vent and tank vapor recovery gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 1,300,000 scf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

Seyed Sadredin, Executive Director / APCO

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DAVID WARNER, Director of Permit Services
C-1121-41-26 : Feb 25 2013 10:53AM – HEINENG . Joint Inspection NOT Required

5. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements of SJVUAPCD Rules 4201 (Amended December 17, 1992), and 4301 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

6. Only natural gas, vapor recovery gas, or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Federally Enforceable Through Title V Permit

7. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]

8. Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

9. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

10. Emission rates shall not exceed any of the following limits: NOx (as NO2): 14 ppmv @ 3% O2 or 0.017 lb/MMBtu (25.5 lb/day), CO: 43 ppmv @ 3%O2 or 0.032 lb/MMBtu (48.0 lb/day), PM10: 0.0076 lb/MMBtu (11.4 lb-PM10/day), or VOC: 0.008 lb/MMBtu (12.0 lb/day). [District Rule 2201, 4201, 4305, 4306 and 4320] Federally Enforceable Through Title V Permit

11. When fired on PUC quality natural gas, the SOx emissions rate shall not exceed 0.00285 lb/MMBtu. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

12. When fired on gases other than PUC quality natural gas, the SOx emissions rate shall not exceed 9 ppmv @ 3% O2 or 0.015 lb/MMBtu (22.8 lb/day). [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

13. Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201]

14. The sulfur content of treated waste gas exiting the H2S Scavenger System shall be determined on a daily basis by gas detector tube sampling. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

15. The sulfur content of the waste gas exiting the sulfur treatment system shall be tested weekly for sulfur content and higher heating value. If compliance with the sulfur emission limits has been demonstrated for 8 consecutive weeks, then the fuel testing frequency shall be semi-annually. If a semi-annual fuel content source test fails to show compliance, weekly testing shall resume. Testing shall be by grab sample analysis by GC-FPD/TCD or other District approved methods for H2S and mercaptans performed in the laboratory and EPA Method 19. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

16. Daily SOx emissions from combustion of waste gas shall be calculated based on the waste gas sulfur content as determined by gas detector tube sampling or the most recent laboratory analysis, whichever is greater. [District Rule 2201 and 4320] Federally Enforceable Through Title V Permit

17. When source or type of gas changes, sampling for sulfur content shall be conducted within one week. A change in fuel type is defined as changing between any of the following: PUC-Quality gas, unprocessed field gas, or any field gas with any specific level of pretreatment. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

18. At least once every 12 months, unit shall be stack tested to demonstrate compliance with the SOx emission limit required by this permit (ppmv @3 % O2) using EPA Method 6C, Method 8 or ARB Method 100. Stack testing for SOx emissions in not required if unit was fired only on PUC quality natural during the 12 months prior to the compliance testing anniversary date. [District Rules 2201 and 4320] Federally Enforceable Through Title V Permit

19. If the unit is fired on noncertified gaseous fuel and compliance with SOx emission limits is achieved through fuel sulfur content limitations, then the sulfur content of the gaseous fuel being fired in the unit shall be determined using ASTM D 1072, D 3031, D 4084, D 3246 or grab sample analysis by GC-FPD/TCD performed in the laboratory. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

20. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rules 2520, 9.4.2 and 4305, 6.2.1] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

21. Duration of start-up or shutdown shall not exceed two hours each per occurrence. During start-up or shutdown, the emissions control system shall be in operation, and emissions shall be minimized insofar as technologically possible. The operator shall maintain daily records of the duration of start-up and shutdown periods. [District Rule 4305, 5.5.6 and 4306, 5.3] Federally Enforceable Through Title V Permit

22. Subject to the definitions and requirements of Section 5.3, District Rule 4306, emission factor limitations of this permit shall not apply during periods of startup, shutdown, or refractory curing. Duration of startup and shutdown shall not exceed 2 hours each per occurrence. Refractory curing period is defined as a maintenance-based reduced-load period of time during which a unit is brought from a shutdown status to staged rates of firing for the sole purpose of curing new refractory lining in the heat exchanger section of the unit, and shall not exceed 30 hours per occurrence. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

23. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

24. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

25. If either the NOx or CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

26. The permittee shall maintain records of: (1) the date and time of NOx, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NOx and CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

27. Source testing to measure natural gas-combustion NOx and CO emissions from this unit shall be conducted at least once every twelve (12) months, (no more than 30 days before or after the required annual source test date). After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months, (no more than 30 days before or after the required 36 months source test date). If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 6.3.1, 4306, 6.3.1, and 4351, 6.3.1]

28. The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

29. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

30. All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

31. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

32. The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, NOx (lb/MMBtu) - EPA Method 19, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, stack gas moisture content - EPA Method 4, stack gas velocities - EPA Method 2, and fuel gas sulfur content - ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rules 1081, 4305, 4306, 6.2, and 4351] Federally Enforceable Through Title V Permit

33. NOx, and CO emissions shall be measured with annual source testing conducted by independent testing laboratory with sample collection by ARB certified testing laboratory and shall be witnessed or authorized by the District. [District Rule 1081, 3.0, 4.0 and Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

34. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

35. If the steam generator is fired on PUC-regulated natural gas, then the permittee shall maintain on file copies of all natural gas bills or fuel throughput records for a period of five years. [District Rule2520, 9.3.2]

36. If the steam generator is not fired on PUC-regulated natural gas, then the sulfur content of the non-certified (non PUC/FERC regulated) natural gas being fired in the steam generator shall be determined using ASTM D 1072, D 4468, D 4084, D 3246, or double GC for H2S and mercaptans. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

37. Compliance with permit conditions in the Title V permit shall be deemed compliance with the requirements of County Rules 108 (Kings), 108.1 (Fresno, Merced, San Joaquin, Tulare, Kern, and Stanislaus), and 110 (Madera), 402 (Madera), 404 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 405 (Madera), 408 (Fresno, Kern, Tulare, Kings, Stanislaus, Merced, and San Joaquin), 407.2 (Kern, Tulare, Kings, Stanislaus, and San Joaquin), and 408.2 (Merced). A permit shield is granted from these requirements. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

38. Compliance with permit conditions in the Title V permit shall be deemed compliance with the following requirements: SJVUAPCD Rules 4201 (Last Amended December 17, 1992), 4301 (Last Amended December 17, 1992), 4406 (Amended December 17, 1992), and 4801 (Amended December 17, 1992). A permit shield is granted from these requirements. [District Rule 2520, 13.2]

39. This unit commenced construction, modification, or reconstruction prior to June 19, 1984. This unit has not been used to produce electricity for sale in 1985 or on or after November 15, 1990. Therefore, the requirements of 40 CFR 72.6(b) and 40 CFR 60.40c do not apply to this source. A permit shield is granted from this requirement. [District Rule 2520, 13.2] Federally Enforceable Through Title V Permit

40. Permittee shall maintain daily record of all natural gas consumption including waste gas consumption, fuel sulfur content, calculated SOx emissions, supplier certifications and test results to show compliance with the conditions of this permit. The operator shall record daily amount and type (s) of fuel(s) combusted and all dates on which unit is fired on any non certified fuel and record specific type(s) of non certified fuel used. [District Rule 1070 and District Rule 2520, section 9.4.2]

41. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, and 4306]

42. ATC C-1121-41-25 shall be canceled upon implementation of this ATC. [District Rule 2201] Federally Enforceable Through Title V Permit

43. This ATC shall be implemented concurrent with ATCs C-1121-17-26,-18-26, -19-26, and -168-11 [District Rule 2201] Federally Enforceable Through Title V Permit

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: C-1121-168-11 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: AERA ENERGY LLC
MAILING ADDRESS: 10000 MING AVE
P O BOX 11164
BAKERSFIELD, CA 93389-1164

LOCATION: HEAVY OIL PRODUCTION
FRESNO COUNTY, CA

EQUIPMENT DESCRIPTION:
MODIFICATION OF 7.16 MMBTU/HR FLARE TO BE USED TO INCINERATE NATURAL, WELL CASING, AND VAPOR RECOVERY GAS DURING MAINTENANCE OF FOUR 62.5 MMBTU/HR STEAM GENERATORS (C-1121-17, -18, -19, AND -41): INCREASE WASTE GAS FLOW RATE FROM 675,000 SCF/DAY TO 1.3 MMSCF/DAY

CONDITIONS

1. No modification to this unit shall be performed without an Authority to Construct for such modification(s), except for changes specified in conditions below. [District Rule 2010] Federally Enforceable Through Title V Permit
2. This equipment shall not be operated for any reason until an Authority to Construct permit is issued approving all necessary retrofits required to comply with the applicable requirements of District Rule 4311. [District Rule 4311] Federally Enforceable Through Title V Permit
3. The operator shall permanently disconnect the fuel supply line serving this unit. [District Rule 4311] Federally Enforceable Through Title V Permit
4. All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201] Federally Enforceable Through Title V Permit
5. Only PUC-quality natural gas or a combination of natural gas and vapor recovery gas shall be used as fuel. [District Rule 2201] Federally Enforceable Through Title V Permit
6. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit
7. Fuel consumption for the flare shall not exceed 1.35 MMscf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 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.

Seyed Sadredin, Executive Director / APCO

DRAFT

DAVID WARNER, Director of Permit Services
C-1121-168-11 · Feb 25 2013 10:53AM – HEINENG : Joint Inspection NOT Required

8. Combined exhaust gases combusted within steam generators '-17, '-18, '-19, and '-41, from the four CVR systems (C-1121-38, -39, -114, & -116) and the section 32 TVR system shall not exceed 1,300,000 scf/day. [District Rule 2201] Federally Enforceable Through Title V Permit

9. When fired only on natural gas, emissions from the flare shall not exceed any of the following limits: 0.008 lb-PM10/MMBtu; 0.00285 lb-SOx/MMBtu calculated as SO2; 0.068 lb-NOx/MMBtu calculated as NO2, or 30 ppmv @ 3% O2; 0.063 lb-VOC/MMBtu, or 0.37 lb-CO/MMBtu. [District NSR Rules, Rule 4201, 3.1 & Rule 4301, 5.1, 5.2] Federally Enforceable Through Title V Permit

10. When fired only on waste gas, emissions from the flare shall not exceed any of the following limits: 0.0.008 lb-PM10/MMBtu; 3.31lb-SOx/MMBtu calculated as SO2; 0.068 lb-NOx/MMBtu calculated as NO2, or 30 ppmv @ 3% O2; 0.063 lb-VOC/MMBtu, or 0.37 lb-CO/MMBtu. [District NSR Rules, Rule 4201, 3.1 & Rule 4301, 5.1, 5.2] Federally Enforceable Through Title V Permit

11. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]

12. Combined emissions of SOx, calculated as SO2, from the steam generators and the flare (C-1121-17, -18, -19, -41, & -168) shall not exceed 28,580 lb/yr. [District Rule 2201] Federally Enforceable Through Title V Permit

13. The sulfur content of treated waste gas exiting the H2S Scavenger System shall not exceed 5000 ppmv. Sulfur content shall be determined on a daily basis by gas detector tube sampling. [District Rule 2201] Federally Enforceable Through Title V Permit

14. Lo-Cost H2S scavenging system shall be used whenever vapor recovery gas is fired in this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

15. Operation of this flare shall only occur when steam generators C-1121-17, -18,-19, and -41 are all shut down due to maintenance. [District Rule 2201] Federally Enforceable Through Title V Permit

16. The flame shall be present at all times when combustible gases are vented through the flare. [District Rule 4311] Federally Enforceable Through Title V Permit

17. The outlet shall be equipped with an automatic ignition system, or, shall operate with a pilot flame present at all times when combustible gases are vented through the flare, except during purge periods for automatic-ignition equipped flares. [District Rule 4311] Federally Enforceable Through Title V Permit

18. Except for flares equipped with a flow-sensing ignition system, a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting at least one pilot flame or the flare flame is present shall be installed and operated. Flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot shall use purge gas for purging. [District Rule 4311] Federally Enforceable Through Title V Permit

19. Flare gas pressure shall be greater than or equal to 5 psig. [District Rule 2201] Federally Enforceable Through Title V Permit

20. Gas line to flare shall be equipped with operational, volumetric flow rate indicator. [District Rule 2201] Federally Enforceable Through Title V Permit

21. Operation of the flare shall not exceed 48 hours per calendar quarter or 192 hours per calendar year. [District Rule 2201] Federally Enforceable Through Title V Permit

22. Records of operating hours, sulfur content, and gas volume flared shall be maintained, retained on the premises for at least five years, and be made available for District inspection on request. [District Rule 2201] Federally Enforceable Through Title V Permit

23. ATC C-1121-168-10 shall be implemented prior to implementation of this ATC. [District Rule 2201]

24. This ATC shall be implemented concurrent with ATCs C-1121-17-26, -18-26, -19-26, and -41-26. [District Rule 2201] Federally Enforceable Through Title V Permit

DRAFT

Application Emissions

Permit #: C-1121-17-26	**Last Updated**
Facility: AERA ENERGY LLC	08/15/2012 HEINENG

Equipment Pre-Baselined: NO

	NOX	SOX	PM10	CO	VOC
Potential to Emit (lb/Yr):	9308.0	8322.0	4161.0	17520.0	4380.0
Daily Emis. Limit (lb/Day)	25.5	22.8	11.4	48.0	12.0
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	-136.0	0.0	0.0	0.0	0.0
Q2:	-136.0	0.0	0.0	0.0	0.0
Q3:	-136.0	0.0	0.0	0.0	0.0
Q4:	-136.0	0.0	0.0	0.0	0.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					
Quarterly Offset Amounts (lb/Qtr)					
Q1:					
Q2:					
Q3:					
Q4:					

Application Emissions

Permit #: C-1121-18-26	**Last Updated**
Facility: AERA ENERGY LLC	08/15/2012 HEINENG

Equipment Pre-Baselined: NO

	NOX	SOX	PM10	CO	VOC
Potential to Emit (lb/Yr):	9380.0	8322.0	4161.0	17520.0	4380.0
Daily Emis. Limit (lb/Day)	25.5	22.8	11.4	48.0	12.0
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	-136.0	0.0	0.0	0.0	0.0
Q2:	-136.0	0.0	0.0	0.0	0.0
Q3:	-136.0	0.0	0.0	0.0	0.0
Q4:	-136.0	0.0	0.0	0.0	0.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					
Quarterly Offset Amounts (lb/Qtr)					
Q1:					
Q2:					
Q3:					
Q4:					

Application Emissions

Permit #: C-1121-19-26	**Last Updated**
Facility: AERA ENERGY LLC	08/15/2012 HEINENG

Equipment Pre-Baselined: NO

	NOX	SOX	PM10	CO	VOC
Potential to Emit (lb/Yr):	9308.0	8322.0	4161.0	17520.0	4380.0
Daily Emis. Limit (lb/Day)	25.5	22.8	11.4	48.0	12.0
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	-136.0	0.0	0.0	0.0	0.0
Q2:	-136.0	0.0	0.0	0.0	0.0
Q3:	-136.0	0.0	0.0	0.0	0.0
Q4:	-136.0	0.0	0.0	0.0	0.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					
Quarterly Offset Amounts (lb/Qtr)					
Q1:					
Q2:					
Q3:					
Q4:					

Application Emissions

Permit #: C-1121-41-26	**Last Updated**
Facility: AERA ENERGY LLC	08/15/2012 HEINENG

Equipment Pre-Baselined: NO

	NOX	SOX	PM10	CO	VOC
Potential to Emit (lb/Yr):	9308.0	8322.0	4161.0	17520.0	4380.0
Daily Emis. Limit (lb/Day)	25.5	22.8	11.4	48.0	12.0
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	-136.0	0.0	0.0	0.0	0.0
Q2:	-136.0	0.0	0.0	0.0	0.0
Q3:	-136.0	0.0	0.0	0.0	0.0
Q4:	-136.0	0.0	0.0	0.0	0.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					
Quarterly Offset Amounts (lb/Qtr)					
Q1:					
Q2:					
Q3:					
Q4:					

Application Emissions

Permit #: C-1121-168-11	**Last Updated**
Facility: AERA ENERGY LLC	11/01/2012 HEINENG

Equipment Pre-Baselined: NO

	NOX	SOX	PM10	CO	VOC
Potential to Emit (lb/Yr):	402.0	3445.0	48.0	2198.0	374.0
Daily Emis. Limit (lb/Day)	50.5	430.3	5.9	274.8	46.8
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	0.0	0.0	0.0	0.0	0.0
Q2:	0.0	0.0	0.0	0.0	0.0
Q3:	0.0	0.0	0.0	0.0	0.0
Q4:	0.0	0.0	0.0	0.0	0.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					
Quarterly Offset Amounts (lb/Qtr)					
Q1:					
Q2:					
Q3:					
Q4:					

Appendix E
Health Risk Assessment

San Joaquin Valley Air Pollution Control District
Risk Management Review

To:	George Heinen – Permit Services
From:	Cheryl Lawler – Technical Services
Date:	January 8, 2013
Facility Name:	Aera Energy LLC
Location:	Coalinga Heavy Oil Field
Application #(s):	C-1121-17-26, 18-26, 19-26, 41-26, 168-11
Project #:	C-1120160

A. RMR SUMMARY

RMR Summary			
Categories	**Increase Waste Gas Usage (Units 17-26, 18-26, 19-26, 41-26, 168-11)**	**Project Totals**	**Facility Totals**
Prioritization Score	0.09	0.09	>1
Acute Hazard Index	0.01	0.01	0.03
Chronic Hazard Index	0.00	0.00	0.01
Maximum Individual Cancer Risk	**3.31E-06**	3.31E-06	4.08E-06
T-BACT Required?	**Yes - VOCs**		
Special Permit Conditions?	**Yes**		

Proposed Permit Conditions

To ensure that human health risks will not exceed District allowable levels; the following permit conditions must be included for:

Units 17-26, 18-26, 19-26, 41-26, 168-11

1. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102] N

B. RMR REPORT

I. Project Description

Technical Services received a request on January 2, 2013, to perform a Risk Management Review for the proposed modification of four existing steam generators and one flare to change the Specific Limiting Condition to increase the usage of waste gas. The increased waste gas could be burned in any of the generators or flare, as long as the total doesn't exceed the conditioned limit.

II. Analysis

Toxic emissions for the project were calculated using 2001 Ventura County Air Pollution Control District emission factors for natural gas and waste gas fired external combustion and on a refinery gas composition analysis from the 2005 report *FINAL REPORT Test of TDA's Direct Oxidation Process for Sulfur Recovery.* The processing engineer provided the increased waste gas usage rates. Technical Services performed a prioritization using the District's HEARTs database. Since the total facility cumulative prioritization score was greater than one, a refined health risk assessment was required. The AERMOD model was used, with the parameters outlined below and meteorological data for 2005-2009 from Hanford to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the Hot Spots Analysis and Reporting Program (HARP) risk assessment module to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

Analysis Parameters			
Source Type	Point	**Location Type**	Rural
Stack Height (m)	4.57	**Closest Receptor (m)**	1609
Stack Diameter. (m)	0.91	**Type of Receptor**	Residence & Business
Stack Exit Velocity (m/s)	4.38	**Hourly Waste Gas Increase (mmscf/hr)**	0.03
Stack Exit Temp. (°K)	450	**Annual Waste Gas Increase (mmscf/yr)**	246.4

III. Conclusions

The acute and chronic indices are below 1.0 and the cancer risk factor associated with the project is **3.31E-06**, which is greater than the 1 in a million threshold. In accordance with the District's Risk Management Policy, the project is approved **with** Toxic Best Available Control Technology (T-BACT).

To ensure that human health risks will not exceed District allowable levels; the permit conditions listed on page 1 of this report must be included for the proposed project.

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

Attachments

RMR Request Form
Oilfield Natural Gas & Waste Gas Emissions Worksheet
Prioritization
Risk Results
Facility Summary

Appendix F
BACT Guideline

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.4.5*

Last Update 3/10/1994

Oilfield Waste Gas Incinerator

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
CO	Natural gas auxiliary fuel	Natural gas or LPG auxiliary fuel	
NOx	Natural gas auxiliary fuel	Natural gas or LPG auxiliary fuel	
PM10		Vapor control system and 95% sulfur removal by scrubber or vapors no greater than 0.2 gr S/100 dscf and natural gas or LPG auxiliary fuel	
SOx		Vapor control system and 95% sulfur removal by scrubber or vapors no greater than 0.2 gr S/100 dscf and natural gas or LPG auxiliary fuel	
VOC	Natural gas auxiliary fuel	Natural gas or LPG auxiliary fuel	

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

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