



**FEB 24 2014**

Mr. Raymond Rodriquez  
Occidental of Elk Hills  
10800 Stockdale Hwy  
Bakersfield, CA 93311

**Re: Proposed ATC / Certificate of Conformity (Significant Mod)  
District Facility # S-6848  
Project # S-1133056**

Dear Mr. Rodriquez:

Enclosed for your review is the District's analysis of an application for Authority to Construct for the facility identified above. You requested that a Certificate of Conformity with the procedural requirements of 40 CFR Part 70 be issued with this project. The project is to install an 85 MMBtu/hr natural gas/propane/TEOR-fired steam generator.

After addressing all comments made during the 30-day public notice and the 45-day EPA comment periods, the District intends to issue the Authority to Construct with a Certificate of Conformity. Please submit your comments within the 30-day public comment period, as specified in the enclosed public notice. Prior to operating with modifications authorized by the Authority 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: Mike Tollstrup, CARB (w/enclosure) via email  
cc: Gerardo C. Rios, EPA (w/enclosure) via email

**Seyed Sadredin**  
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**San Joaquin Valley Air Pollution Control District**  
**Authority to Construct Application Review**  
**Steam Generator**

Facility Name:	Occidental of Elk Hills Inc	Date:	February 12, 2014
Mailing Address:	10800 Stockdale Hwy Bakersfield, CA 93311	Engineer:	Thom Maslowski
Contact Person:	Raymond Rodriquez	Lead Engineer:	Joven Refuerzo
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E-Mail:	raymond_rodriquez@oxy.com		
Application #(s):	S-6848-12-1		
Project #:	S-1133056		
Deemed Complete:	December 26, 2013		

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**I. Proposal**

Occidental of Elk Hills Inc (Oxy) has requested an Authority to Construct (ATC) for one 85 MMBtu/hr steam generator. The unit will be equipped with flue gas recirculation (FGR), an ultra low NOx burner and will be fired on natural gas, propane, and TEOR gas. The steam generator was originally issued an ATC S-6848-12-0 in March of 2010. However, the applicant is now proposing to have flexibility in the equipment description allowing an equivalent burner in accordance with District Policy APR 1035. Therefore, this project ATC S-6848-12-1 will cancel and supersede the original ATC which will be ensured by the following condition:

*This Authority to Construct (ATC) cancels and supersedes Authority to Construct (ATC) S-6848-12-0. [District Rule 2201] N*

Oxy received their Title V Permit on December 31, 2012. This modification can be classified as a Title V significant modification pursuant to Rule 2520, and can be processed with a Certificate of Conformity (COC). The facility has requested that this project be processed in that manner; therefore, Oxy will be required to submit a Title V administrative amendment application prior to operating under the revised provisions of the ATC issued with this project.

Facilities S-6848 and S-1327 constitute one stationary source.

**II. Applicable Rules**

Rule 2201	New and Modified Stationary Source Review Rule (4/21/11)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4201	Particulate Matter Concentration (12/17/92)
Rule 4301	Fuel Burning Equipment (12/17/92)

- Rule 4304 Equipment Tuning Procedure for Boilers, Steam Generators and Process Heaters (10/19/95)
- Rule 4305 Boilers, Steam Generators and Process Heaters – Phase 2 (8/21/03)
- Rule 4306 Boilers, Steam Generators and Process Heaters – Phase 3 (3/17/05)
- Rule 4320 Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/Hr (Adopted October 16, 2008)
- Rule 4351 Boilers, Steam Generators and Process Heaters – Phase 1 (8/21/03)
- Rule 4405 Oxides of Nitrogen Emission from Existing Steam Generators Used in Thermally Enhanced Oil Recovery – Central and Western Kern County Fields (12/17/92)
- Rule 4406 Sulfur Compounds from Oil-Field Steam Generators – Kern County (12/17/92)
- 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 TEOR operation will be operated within Oxy's Heavy Oil Western Stationary Source located within SE/4 Sec 35, T 30S, R 22E. 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

Oxy plan to use a 85 MMBtu/hr natural gas/propane/TEOR fired steam generator to produce steam for new thermally enhanced oil production operations in their Western Heavy Oil Stationary Source. The steam generator will be fired on a combination of produced gas, propane and/or PUC-quality natural gas. Sour gas will be treated in a fuel sulfur removal system (listed on S-6848-8) prior to combustion in the steam generator. The sulfur content of the treated sour gas is expected to contain no more than 1 grain of sulfur per 100 scf.

The steam generator is used to provide high quality steam for injection into heavy crude oil production zones. The heat added by the steam reduces the viscosity of the crude oil facilitating production.

### V. Equipment Listing

S-6848-12-1: 85 MMBTU/HR NATURAL GAS/PROPANE/TEOR-FIRED STEAM GENERATOR WITH MAGNA-FLAME LE BURNER (OR EQUIVALENT) AND FLUE GAS RECIRCULATION

As per District policy APR 1035 Flexibility in Equipment Descriptions in ATCs, some flexibility in the final specifications of the equipment is requested and will be allowed as stated in the following ATC conditions:

- The permittee shall obtain written District approval for the use of any equivalent equipment not specifically approved by this Authority to Construct. Approval of the equivalent equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate equipment is equivalent to the specifically authorized equipment. [District Rule 2201]
- The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]
- Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]
- No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]

## **VI. Emission Control Technology Evaluation**

Low-NOX burners reduce NOX formation by producing lower flame temperatures (and longer flames) than conventional burners. Conventional burners thoroughly mix all the fuel and air in a single stage just prior to combustion, whereas low-NOX burners delay the mixing of fuel and air by introducing the fuel (or sometimes the air) in multiple stages. Generally, in the first combustion stage, the air-fuel mixture is fuel rich. In a fuel rich environment, all the oxygen will be consumed in reactions with the fuel, leaving no excess oxygen available to react with nitrogen to produce thermal NOX. In the secondary and tertiary stages, the combustion zone is maintained in a fuel-lean environment. The excess air in these stages helps to reduce the flame temperature so that the reaction between the excess oxygen with nitrogen is minimized.

The use of flue gas re-circulation (FGR) can reduce nitrogen oxides (NOX) emissions by 60% to 70%. In an FGR system, a portion of the flue gas is re-circulated back to the inlet air. As flue gas is composed mainly of nitrogen and the products of combustion, it is much lower in oxygen than the inlet air and contains virtually no combustible hydrocarbons to burn. Thus, flue gas is practically inert. The addition of an inert mass of gas to the combustion reaction serves to absorb heat without producing heat, thereby lowering the flame temperature. Since thermal NOX is formed by high flame temperatures, the lower flame temperatures produced by FGR serve to reduce thermal NOX.

## **VII. General Calculations**

### **A. Assumptions**

- The maximum operating schedule is 8760 hours per year (per Applicant).
- Heating value of natural gas is 1,000 MMBtu/MMscf (District policy).
- The unit is fired on natural gas/TEOR/propane gas (per Applicant).

- Heating value of propane is 91.5 MMBtu/1,000 gallons (AP-42, 1.5.3.1) equivalent to 684,420 Btu/scf
- F-factor for natural gas, corrected to 68 °F, is 8,578 dscf/MMBtu (40 CFR 60, Appendix B).
- Sulfur content in PUC quality natural gas, and gas produced during thermally enhanced oil recovery (TEOR) is 1.0 grain/100 dscf (=0.00285 lb-SOx/MMBtu) (BACT limit and per Applicant).
- Sulfur content in propane is 2.5 grain/100 dscf (=0.00285 lb-SOx/MMBtu) (BACT limit and per Applicant; see Appendix E for Propane sulfur analysis).
- Proposed emission factors are worst case scenario for all fuel types (BACT limit and per Applicant).

**B. Emission Factors**

Emissions Factors S-6848-12 for all fuel types		
Pollutant	lb/MMBtu (ppmv @ 3%O2)	Source
NO <sub>x</sub>	0.0085 (7)	BACT and Applicant
SO <sub>x</sub>	0.00285	BACT and Applicant
PM <sub>10</sub>	0.0076	AP 42
CO	0.022 (30)	Applicant
VOC	0.006	AP42 and Applicant

Propane

Oxy has provided gas analyses (see Appendix E) that show propane sulfur content much less than the value of 2.5 grain/100 dscf (=0.00285 lb/MMBtu). However, oxy has requested that the sulfur limit for propane fuel be established at 2.5 grain/100 dscf (=0.00285 lb/MMBtu). This will allow oxy a margin of compliance with their propane fuel suppliers.

The fuel sulfur grain limit is calculated as follows:

$$\frac{0.00285 \text{ lb} \cdot \text{SO}_x}{\text{MMBtu}} \left( \frac{2,500 \text{ Btu}}{\text{dscf}} \right) \frac{\text{MMBtu}}{10^6 \text{ Btu}} \left( \frac{7,000 \text{ gr}}{1 \text{ lb}} \right) \frac{32 \text{ lb} \cdot \text{S}}{64 \text{ lb} \cdot \text{SO}_2} = 2.5 \frac{\text{gr} \cdot \text{S}}{100 \text{ dscf}}$$

**C. Calculations**

**1. Pre-Project Potential to Emit (PE1)**

Since this is a new emissions unit, PE1 = 0 for all pollutants.

## 2. Post Project Potential to Emit (PE2)

The potential to emit for the steam generator is calculated as follows, and summarized in the table below:

$$\begin{aligned} PE2_{NO_x} &= (0.0085 \text{ lb/MMBtu}) * (85 \text{ MMBtu/hr}) * (24 \text{ hr/day}) \\ &= 17.3 \text{ lb NO}_x/\text{day} \\ &= (0.0085 \text{ lb/MMBtu}) * (85 \text{ MMBtu/hr}) * (24 \text{ hr/day}) * (365 \text{ day/year}) \\ &= 6329 \text{ lb NO}_x/\text{year} \end{aligned}$$

<b>S-6848-12-1</b>		
<b>Post Project Potential to Emit (PE2)</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	17.3	6329
SO <sub>x</sub>	5.8	2122
PM <sub>10</sub>	15.5	5,659
CO	44.9	16,381
VOC	12.2	4468

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

Pursuant to Section 4.9 of 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. The facility has no ERCs for on-site reductions.

<b>Pre-Project Stationary Source Potential to Emit [SSPE1] (lb/year)</b>					
Permit Unit	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC
ATC S-1327-31-1	0	0	0	0	73
ATC S-1327-32-2	3,469	899	2,397	11,668	1,734
PTO S-1327-34-2	3627	574	1531	6649	604
ATC S-1327-35-1	9855	1560	5475	20,258	1643
ATC S-1327-36-0	0	0	0	0	3665
ATC S-1327-37-0	0	0	0	0	2482
ATC S-1327-38-0	0	0	0	0	3665
PTO S-1327-41-1	5256	150	399	4415	289
PTO S-1327-42-4	2110	42	248	11,479	1955
ATC S-1327-52-0	0	0	0	0	229
ATC S-1327-53-0	0	0	0	0	54
ATC S-1327-54-0	0	0	0	0	54
PTO S-1327-55-0	0	0	0	0	60

PTO S-1327-56-0	0	0	0	0	87
PTO S-1327-57-0	0	0	0	0	183
PTO S-1327-58-0	0	0	0	0	329
PTO S-1327-59-0	0	0	0	0	694
PTO S-1327-60-0	0	0	0	0	694
PTO S-1327-70-0	4344	86	511	23634	5152
PTO S-1327-76	0	0	0	0	415
PTO S-1327-77	0	0	0	0	525
PTO S-1327-78	0	0	0	0	190
PTO S-1327-79	0	0	0	0	373
PTO S-1327-80	0	0	0	0	1993
PTO S-1327-81	0	0	0	0	1993
PTO S-1327-82	0	0	0	0	150
PTO S-1327-83	9898	438	1169	53911	9168
PTO S-1327-84-0	0	0	0	0	169
PTO S-1327-85-0	0	0	0	0	170
PTO S-1327-86-0	0	0	0	0	170
S-6848 contribution	0	0	0	0	5,696
Pre-Project (SSPE1 total)	38,559	3749	11,730	132,014	44,658

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

Pursuant to Section 4.10 of 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 facility has no ERCs for on-site reductions.

Post Project Stationary Source Potential to Emit [SSPE2] (lb/year)					
Permit Unit	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC
ATC S-1327-31-1	0	0	0	0	73
ATC S-1327-32-2	3,469	899	2,397	11,668	1,734
PTO S-1327-34-2	3627	574	1531	6649	604
ATC S-1327-35-1	9855	1560	5475	20,258	1643
ATC S-1327-36-0	0	0	0	0	3665
ATC S-1327-37-0	0	0	0	0	2482
ATC S-1327-38-0	0	0	0	0	3665
PTO S-1327-41-1	5256	150	399	4415	289
PTO S-1327-42-4	2110	42	248	11,479	1955
ATC S-1327-52-0	0	0	0	0	229
ATC S-1327-53-0	0	0	0	0	54
ATC S-1327-54-0	0	0	0	0	54
PTO S-1327-55-0	0	0	0	0	60

PTO S-1327-56-0	0	0	0	0	87
PTO S-1327-57-0	0	0	0	0	183
PTO S-1327-58-0	0	0	0	0	329
PTO S-1327-59-0	0	0	0	0	694
PTO S-1327-60-0	0	0	0	0	694
PTO S-1327-70-0	4344	86	511	23634	5152
PTO S-1327-76	0	0	0	0	415
PTO S-1327-77	0	0	0	0	525
PTO S-1327-78	0	0	0	0	190
PTO S-1327-79	0	0	0	0	373
PTO S-1327-80	0	0	0	0	1993
PTO S-1327-81	0	0	0	0	1993
PTO S-1327-82	0	0	0	0	150
PTO S-1327-83	9898	438	1169	53911	9168
PTO S-1327-84-0	0	0	0	0	169
PTO S-1327-85-0	0	0	0	0	170
PTO S-1327-86-0	0	0	0	0	170
S-6848 contribution	0	0	0	0	5,696
S-6848-12-1	6,329	2,122	5,659	16,381	4,468
Post Project (SSPE2 total)	44,888	5,871	17,425	148,395	49,126

## 5. Major Source Determination

### Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status the following shall not be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

Major Source Determination (lb/year)					
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC
Pre-Project SSPE (SSPE1)	38,559	3749	11,730	132,014	44,658
Post Project SSPE (SSPE2)	44,888	5,871	17,425	148,395	49,126
Major Source Threshold	20,000	140,000	140,000	200,000	20,000
Major Source?	Yes	No	No	No	Yes



This source is an existing Major Source for NOx and VOC emissions and will remain a Major Source for VOC.

**Rule 2410 Major Source Determination:**

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). Therefore the following PSD Major Source thresholds are applicable.

PSD Major Source Determination (tons/year)							
	NO2	VOC	SO2	CO	PM	PM10	CO2e
Estimated Facility PE before Project Increase	20	22	2	66	9	9	166,978 <sup>1</sup>
PSD Major Source Thresholds	250	250	250	250	250	250	100,000
PSD Major Source ?	N/A	N/A	N/A	N/A	N/A	N/A	Y

As shown above, the facility is an existing major source for PSD for at least one pollutant. Therefore the facility is an existing major source for PSD.

**6. Baseline Emissions (BE)**

The BE calculation (in lbs/year) is performed pollutant-by-pollutant for each unit within the project, to calculate the QNEC and if applicable, to determine the amount of offsets required.

Pursuant to Section 3.7 of District Rule 2201, 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 3.22 of District Rule 2201.

Since this is a new emissions unit, BE = PE1 = 0 for all pollutants.

<sup>1</sup> See Appendix D for CO2e Calculations.

## 7. SB 288 Major Modification

SB 288 Major Modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since this facility is a major source for NO<sub>x</sub> and VOC, the project's PE2 is compared to the SB 288 Major Modification Thresholds in the following table in order to determine if the SB 288 Major Modification calculation is required.

SB 288 Major Modification Thresholds			
Pollutant	Project PE2 (lb/year)	Threshold (lb/year)	SB 288 Major Modification Calculation Required?
NO <sub>x</sub>	6329	50,000	No
SO <sub>x</sub>	2122	80,000	No
PM <sub>10</sub>	5,659	30,000	No
VOC	4,468	50,000	No

Since none of the SB 288 Major Modification Thresholds are surpassed with this project, this project does not constitute an SB 288 Major Modification.

## 8. Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

The determination of Federal Major Modification is based on a two-step test. For the first step, only the emission *increases* are counted. Emission decreases may not cancel out the increases for this determination.

### Step 1

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

$$\text{Emission Increase} = \text{PAE} - \text{BAE} - \text{UBC}$$

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

If there is no increase in design capacity or potential to emit, the PAE is equal to the annual emission rate at which the unit is projected to emit in any one year, selected by the operator, within 5 years after the unit resumes normal operation (10 years for existing units with an increase in design capacity or potential to emit). If detailed PAE are not provided, the PAE is equal to the PE2 for each permit unit.

The BAE is calculated based on historical emissions and operating records for any 24 month period, selected by the operator, within the previous 10 year period (5 years for electric utility steam generating units). The BAE must be adjusted to exclude any non-compliant operation emissions and emissions that are no longer allowed due to lower applicable emission limits that were in effect when this application was deemed complete.

UBC: 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.

Since this is a new emissions unit  $BAE=UBC = 0$ ; therefore;  
Emission Increase = PAE = PE2

The project's combined total emission increases are calculated in above and compared to the Federal Major Modification Thresholds in the following table.

Federal Major Modification Thresholds for Emission Increases			
Pollutant	Total Emissions Increases (lb/yr)	Thresholds (lb/yr)	Federal Major Modification?
NO <sub>x</sub> *	6,329	0	Yes
VOC*	4,468	0	Yes
PM <sub>10</sub>	5,659	30,000	No
PM <sub>2.5</sub>	5,659	20,000	No
SO <sub>x</sub>	2,122	80,000	No

\*If there is any emission increases in NO<sub>x</sub> or VOC, this project is a Federal Major Modification and no further analysis is required.

Since there is an increase in NO<sub>x</sub> and VOC emissions, this project constitutes a Federal Major Modification, and no further analysis is required.

### 9. 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:

- NO<sub>2</sub> (as a primary pollutant)
- SO<sub>2</sub> (as a primary pollutant)
- CO
- PM
- PM<sub>10</sub>
- Greenhouse gases (GHG): CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, HFCs, PFCs, and SF<sub>6</sub>

The first step of this PSD evaluation consists of determining whether the facility is an existing PSD Major Source or not (See Section VII.C.5 of this document).

In the case the facility is an existing PSD Major Source, the second step of the PSD evaluation is to determine if the project results in a PSD significant increase.

In the case the facility is NOT an existing PSD Major Source but is an existing source, the second step of the PSD evaluation is to determine if the project, by itself, would be a PSD major source.

In the case the facility is new source, the second step of the PSD evaluation is to determine if this new facility will become a new PSD major Source as a result of the project and if so, to determine which pollutant will result in a PSD significant increase.

**I. 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.

**II. Significance of Project Emission Increase Determination**

**a. 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.

<b>PSD Significant Emission Increase Determination: Potential to Emit (tons/year)</b>						
	NO2	SO2	CO	PM	PM10	CO2e
Total PE from New and Modified Units	3	1	8	3	3	43,187 <sup>2</sup>
PSD Significant Emission Increase Thresholds	40	40	100	25	15	75,000
PSD Significant Emission Increase?	N	N	N	N	N	N

As demonstrated above, because the project has a total potential to emit from all new and modified emission units below the PSD significant emission increase thresholds, this project is not subject to the requirements of Rule 2410 due to a significant emission increase and no further discussion is required.

<sup>2</sup> See Appendix D

## 10. 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. The QNEC for the new emissions unit was calculated for each pollutant by dividing annual emissions by 4 quarters/year. Below is a sample calculation done for NO<sub>x</sub>:

$$PE2 = 6329 \text{ lb-NO}_x/\text{yr}, BE = 0, QNEC = 6329 \text{ lb-NO}_x/\text{yr} / 4 = 1,582 \text{ lb-NO}_x/\text{qtr}$$

## VIII. Compliance

### Rule 2201 New and Modified Stationary Source Review Rule

#### A. Best Available Control Technology (BACT)

##### 1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions\*:

- a. Any new emissions unit with a potential to emit exceeding two pounds per 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,
- c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
- 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.

\*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. New emissions units – PE > 2 lb/day

As seen in Section VII.C.2 of this evaluation, the applicant is proposing to install a new steam generators with a PE greater than 2 lb/day for NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>, CO, and VOC. BACT is triggered for NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>, VOC and CO since the PEs are greater than 2 lbs/day; however, BACT is not triggered for CO since the SSPE2 for CO is not greater than 200,000 lbs/year, as demonstrated in Section VII.C.5 of this document.

##### b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore BACT is not triggered.

**c. Modification of emissions units – AIPE > 2 lb/day**

As discussed in Section I above, there are no modified emissions units associated with this project. Therefore BACT is not triggered.

**d. SB 288/Federal Major Modification**

As discussed in Sections VII.C.7 and VII.C.8 above, this project does constitute a Federal Major Modification for NO<sub>x</sub> and VOC emissions. Therefore BACT is triggered for NO<sub>x</sub> and VOC for the emission unit in the project for which there is an emission increase.

**2. BACT Guideline**

Please note that BACT Guideline 1.2.1 [Steam Generator ( $\geq$  5 MMBtu/hr, Oilfield)] has been rescinded. The NO<sub>x</sub> emission limit requirement of District Rule 4320 is lower than the Achieved-in-Practice requirement of BACT Guideline 1.2.1 (14 ppmv @ 3% O<sub>2</sub>) ; therefore a project specific BACT analysis will be performed to determine BACT for this project. More details regarding this are provided in Appendix F.

**3. Top-Down BACT Analysis**

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the attached Top-Down BACT Analysis (see Appendix F), BACT has been satisfied with the following:

- NO<sub>x</sub>: 7 ppmvd @ 3% O<sub>2</sub>
- SO<sub>x</sub>: Fired on PUC, quality natural gas, commercial propane, and/or LPG; gaseous fuel 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 dscf; or use of a continuously operating SO<sub>2</sub> scrubber and either achieving 95% by weight control of sulfur compounds or achieving and emission rate of 9 ppmvd SO<sub>2</sub> at stack O<sub>2</sub>.
- PM<sub>10</sub>: Fired on PUC, quality natural gas, commercial propane, and/or LPG; gaseous fuel 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 dscf; or use of a continuously operating SO<sub>2</sub> scrubber and either achieving 95% by weight control of sulfur compounds or achieving and emission rate of 9 ppmvd SO<sub>2</sub> at stack O<sub>2</sub>.
- VOC: Gaseous fuel

## B. Offsets

### 1. Offset Applicability

Offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The SSPE2 is compared to the offset thresholds in the following table.

Offset Determination (lb/year)					
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC
Pre-Project SSPE (SSPE1)	38,559	3,749	11,730	132,014	44,658
Post Project SSPE (SSPE2)	44,888	5,871	17,425	148,395	49,126
Offset Threshold	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	Yes	No	No	No	Yes

### 2. Quantity of Offsets Required

As seen above, the SSPE2 is greater than the offset thresholds for NO<sub>x</sub> and VOC; therefore offset calculations will be required for this project.

#### a. NO<sub>x</sub>

As seen above, the SSPE2 is greater than the offset thresholds; therefore offset calculations will be required for this project.

Per Sections 4.7.1 and 4.7.3, the quantity of offsets in pounds per year for NO<sub>x</sub> is calculated as follows for sources with an SSPE1 greater than the offset threshold levels before implementing the project being evaluated.

Offsets Required (lb/year) =  $(\Sigma[PE2 - BE] + ICCE) \times DOR$ , for all new or modified emissions units in the project,

Where,

PE2 = Post Project Potential to Emit, (lb/year)

BE = Baseline Emissions, (lb/year)

ICCE = Increase in Cargo Carrier Emissions, (lb/year)

DOR = Distance Offset Ratio, determined pursuant to Section 4.8

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)

As calculated in Section VII.C.6 above, the Baseline Emissions (BE) from these units equal zero. Also, there are no increases in cargo carrier emissions; therefore offsets can be determined as follows:

Offsets Required for the steam generator:

$$(\text{lb/year}) = ([\text{PE2} - \text{BE}] + \text{ICCE}) \times \text{DOR}$$

$$\text{PE2 (NO}_x) = 6329 \text{ lb/year}$$

$$\text{BE (NO}_x) = 0 \text{ lb/year}$$

$$\text{ICCE} = 0 \text{ lb/year}$$

$$\begin{aligned} \text{Offsets Required (lb/year)} &= 6329 - 0 + 0 \\ &= 6329 \text{ lb NO}_x/\text{year} \end{aligned}$$

Calculating the appropriate quarterly emissions to be offset for each steam generator is as follows:

S-6848-12-1			
1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
1582	1582	1582	1582

Assuming an offset ratio of 1.5:1, the amount of NO<sub>x</sub> ERCs that need to be withdrawn is:

S-6848-12-1				
	1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
S-6848-12-0	1582	1582	1582	1582
@ 1.5:1	2373	2373	2373	2373

The applicants have stated they plan to use ERC certificate S-3237-2 and S-2824-2, or their daughter(s), to offset the increases in NO<sub>x</sub> emissions associated with project S-1133056. The above certificates have available quarterly NO<sub>x</sub> credits as follows:

S-1133056 (S-6848)				
	<u>1<sup>st</sup> Quarter</u>	<u>2<sup>nd</sup> Quarter</u>	<u>3<sup>rd</sup> Quarter</u>	<u>4<sup>th</sup> Quarter</u>
ERC #S-2824-2	29,265	29,810	30,356	30,356



As seen above, the facility has sufficient credits to fully offset the quarterly NO<sub>x</sub> emissions increases associated with this project.

**Proposed Rule 2201 (offset) Conditions:**

- Prior to operating equipment under this Authority to Construct, permittee shall surrender NO<sub>x</sub> emission reduction credits for the following quantity of emissions: 1st quarter – 1582 lb, 2nd quarter - 1582 lb, 3rd quarter - 1582 lb, and fourth quarter - 1582 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 4/21/11). [District Rule 2201]
- ERC Certificate Number S-2824-2 (or a certificate split from this certificate) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

**b. VOC**

As seen above, the SSPE2 for VOC is greater than the offset thresholds; therefore offset calculations will be required for this project.

Per Sections 4.7.1 and 4.7.3, the quantity of offsets in pounds per year for VOC is calculated as follows for sources with an SSPE1 greater than the offset threshold levels before implementing the project being evaluated.

Offsets Required (lb/year) =  $(\Sigma[PE2 - BE] + ICCE) \times DOR$ , for all new or modified emissions units in the project,

Where,

PE2 = Post Project Potential to Emit, (lb/year)

BE = Baseline Emissions, (lb/year)

ICCE = Increase in Cargo Carrier Emissions, (lb/year)

DOR = Distance Offset Ratio, determined pursuant to Section 4.8

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)

As calculated in Section VII.C.6 above, the Baseline Emissions (BE) from these units equal zero. Also, there are no increases in cargo carrier emissions; therefore offsets can be determined as follows:

Offsets Required for each steam generator:

$$(\text{lb/year}) = ([\text{PE2} - \text{BE}] + \text{ICCE}) \times \text{DOR}$$

$$\begin{aligned} \text{PE2 (VOC)} &= 4468 \text{ lb/year} \\ \text{BE (VOC)} &= 0 \text{ lb/year} \\ \text{ICCE} &= 0 \text{ lb/year} \end{aligned}$$

$$\begin{aligned} \text{Offsets Required (lb/year)} &= 4468 - 0 + 0 \\ &= 4468 \text{ lb VOC/year} \end{aligned}$$

Calculating the appropriate quarterly VOC emissions to be offset for each steam generator is as follows:

S-6848-12-1			
1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
1117	1117	1117	1117

Assuming an offset ratio of 1.5:1, the amount of VOC ERCs that need to be withdrawn is:

S-6848-12-1				
	1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
S-6848-12-0	1117	1117	1117	1117
@ 1.5:1	1676	1676	1676	1676

The applicant for this project has stated they plan to use ERC certificates S-1704-1 and S-1708-1 to offset the increase in VOC emissions associated with the project. The above certificates have available quarterly VOC credits as follows:

S-1133056 (S-6848)				
	1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
ERC #S-1704-1	1695	3741	4523	1688
ERC #S-1708-1	1664	3970	4474	1890
Total	3359	7711	8997	3578

As seen above, the facility has sufficient credits to fully offset the quarterly VOC emissions increases associated with this project.

**Proposed Rule 2201 (offset) Conditions:**

- Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter - 1117 lb, 2nd quarter - 1117 lb, 3rd quarter - 1117 lb, and fourth quarter -

1117 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 4/21/11). [District Rule 2201]

- ERC Certificate numbers S-1704-1 and S-1708-1 (or a certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

## **C. Public Notification**

### **1. Applicability**

Public noticing is required for:

- 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 SSPE 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 Sections VII.C.7 and VII.C.8, this project is an SB 288 or Federal Major Modification. Therefore, public noticing for SB 288 and Federal Major Modification purposes is 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. As seen in Section VII.C.2 above, this project does not include a new emissions unit which has daily emissions greater than 100 lb/day for any pollutant, therefore public noticing for PE > 100 lb/day purposes is not required.

#### **c. Offset Threshold**

The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Threshold				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO <sub>x</sub>	38,559	44,888	20,000 lb/year	No
SO <sub>x</sub>	3,749	5,871	54,750 lb/year	No
PM <sub>10</sub>	11,730	17,425	29,200 lb/year	No
CO	132,014	148,395	200,000 lb/year	No
VOC	44,658	49,126	20,000 lb/year	No

As detailed above, offset thresholds were not surpassed with this project; therefore public noticing isn't 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. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table.

Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice					
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO <sub>x</sub>	38,559	44,888	6,329	20,000 lb/year	No
SO <sub>x</sub>	3,749	5,871	2,122	20,000 lb/year	No
PM <sub>10</sub>	11,730	17,425	5,659	20,000 lb/year	No
CO	132,014	148,395	16,381	20,000 lb/year	No
VOC	44,658	49,126	4,468	20,000 lb/year	No

As demonstrated above, the SSIPEs for all pollutants were less than 20,000 lb/year; therefore public noticing for SSIPE purposes is not required.

**2. Public Notice Action**

As discussed above, public noticing is required for Federal Major Modification purposes. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB), USEPA and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATC for this equipment.

**D. Daily Emission Limits (DELs)**

Daily Emissions Limitations (DELs) and other enforceable conditions are required by Section 3.15 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. Per Sections 3.15.1 and 3.15.2, 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.

**Proposed Rule 2201 (DEL) Conditions:**

S-6848-12-1:

- Emission rates shall not exceed: PM10: 0.0076 lb/MMBtu, VOC: 0.006 lb/MMBtu, 7 ppmvd NOx @ 3% O2 or 0.0085 lb-NOx/MMBtu, or CO: 30 ppmv @ 3% O2 or 0.022 lb-CO/MMBtu. [District Rules 2201, 4305, 4306, and 4320]
- The unit shall only be fired on gaseous fuel that includes PUC quality natural gas, propane, and gas produced during thermally enhanced oil recovery (TEOR) operation or a mixture of any of these fuels. [District Rules 2201 and 4320]
- Sulfur content in PUC quality natural gas, and gas produced during thermally enhanced oil recovery (TEOR) shall not exceed 1.0 grain per 100 dry standard cubic feet. [District Rules 2201, 4301, and 4320]
- Sulfur content in propane fuel shall not exceed 2.5 grain per 100 dry standard cubic feet. [District Rules 2201, 4301, and 4320]

**E. Compliance Assurance**

**1. Source Testing**

This unit is subject to District Rule 4305, Boilers, Steam Generators and Process Heaters, Phase 2, District Rule 4306, Boilers, Steam Generators and Process Heaters, Phase 3 and District Rule 4320 – Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr. Source testing requirements, in accordance with District Rules 4305, 4306 and 4320, will be discussed in Section VIII, *District Rules 4305, 4306 and 4320*, of this evaluation.

**2. Monitoring**

As required by District Rule 4305, Boilers, Steam Generators and Process Heaters, Phase 2, District Rule 4306, Boilers, Steam Generators and Process Heaters, Phase 3 and District Rule 4320 – Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr, this unit is subject to monitoring requirements. Monitoring requirements, in accordance with District Rules 4305, 4306 and 4320, will be discussed in Section VIII, *District Rules 4305, 4306 and 4320*, of this evaluation.

**Recordkeeping**

As required by District Rule 4305, Boilers, Steam Generators and Process Heaters, Phase 2, District Rule 4306, Boilers, Steam Generators and Process Heaters, Phase 3 and District Rule 4320 – Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr, this unit is subject to recordkeeping requirements. Recordkeeping requirements, in

accordance with District Rules 4305, 4306 and 4320, will be discussed in Section VIII, *District Rules 4305, 4306 and 4320*, of this evaluation.

The following permit condition will be listed on permit as follows:

- {2983} 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]

#### **4. Reporting**

No reporting is required to demonstrate compliance with Rule 2201.

#### **F. Ambient Air Quality Analysis**

Section 4.14.1 of this Rule requires that an ambient air quality analysis (AAQA) be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The Technical Services Division of the SJVAPCD conducted the required analysis. Refer to Appendix A of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO<sub>x</sub>, CO, and SO<sub>x</sub>. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for NO<sub>x</sub>, CO, or SO<sub>x</sub>.

The proposed location is in a non-attainment area for the state's PM<sub>10</sub> as well as federal and state PM<sub>2.5</sub> thresholds. As shown by the AAQA summary sheet the proposed equipment will not contribute significantly to a violation of an air quality standard for PM<sub>10</sub> and PM<sub>2.5</sub>.

#### **G. Compliance Certification**

Section 4.15.2 of this Rule requires the owner of a new Major Source or a source undergoing a Title I Modification to demonstrate to the satisfaction of the District that all other Major Sources owned by such person and operating in California are in compliance or are on a schedule for compliance with all applicable emission limitations and standards. As discussed in Section VIII above, this facility is a new major source and this project does constitute a Title I modification, therefore this requirement is applicable. OEHI compliance certification is included in Appendix B.

#### **H. Alternate Siting Analysis**

The current project occurs at an existing facility. The applicant proposes to install a new steam generator.

Since the project will provide a steam generator to be used at the same location, the existing site will result in the least possible impact from the project. Alternative sites would

involve the relocation and/or construction of various support structures on a much greater scale, and would therefore result in a much greater impact.

### **Rule 2520 Federally Mandated Operating Permits**

This facility is subject to this Rule, and has received their Title V Operating Permit. A significant permit modification is defined as a "permit amendment that does not qualify as a minor permit modification or administrative amendment."

A minor permit modification is a permit modification that does not meet the definition of modification as given in Section 111 or Section 112 of the Federal Clean Air Act. Since this project involves the installation of a new emission unit that is subject to an NSPS requirement, the proposed project is considered to be a modification under the Federal Clean Air Act. As a result, the proposed project constitutes a Significant Modification to the Title V Permit.

As discussed above, the facility has applied for a Certificate of Conformity (COC); therefore, the facility must apply to modify their Title V permit with an administrative amendment, prior to operating with the proposed modifications. Continued compliance with this rule is expected. The facility shall not implement the changes requested until the final permit is issued.

### **Rule 4001 New Source Performance Standards (NSPS)**

40 CFR Part 60, Subpart Dc applies to affected Small Industrial-Commercial-Industrial Steam Generation Units between 10 MMBtu/hr and 100 MMBtu/hr (post-6/9/89 construction, modification or, reconstruction). Steam generation units only fired on gaseous fuel are not affected units since this subpart does not include any applicable standards for gaseous fired units. Therefore, Subpart Dc does not apply to these units.

### **Rule 4101 Visible Emissions**

District Rule 4101, Section 5.0, indicates 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 dark or darker than Ringelmann 1 or equivalent to 20% opacity.

A permit condition will be listed on the permits as follows:

- {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]

Therefore, compliance with District Rule 4101 requirements is expected.

### **Rule 4102 Nuisance**

Section 4.0 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, compliance with this rule is expected.

**California Health & Safety Code 41700 (Health Risk Assessment)**

District Policy APR 1905 – Risk Management Policy for Permitting New and Modified Sources 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 or equal to one. According to the Technical Services Memo for this project (Appendix A), the total facility prioritization score including this project was less than or equal to one. Therefore, no future analysis is required to determine the impact from this project and compliance with the District’s Risk Management Policy is expected.

**Rule 4201 Particulate Matter Concentration**

Section 3.1 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot.

F-Factor for NG:	8,578 dscf/MMBtu at 60 °F	
PM10 Emission Factor:	0.0076 lb-PM10/MMBtu	
Percentage of PM as PM10 in Exhaust:	100%	
Exhaust Oxygen (O <sub>2</sub> ) Concentration:	3%	
Excess Air Correction to F Factor =	$\frac{20.9}{(20.9 - 3)}$	= 1.17

$$GL = \left( \frac{0.0076 \text{ lb-PM}}{\text{MMBtu}} \times \frac{7,000 \text{ grain}}{\text{lb-PM}} \right) / \left( \frac{8,578 \text{ ft}^3}{\text{MMBtu}} \times 1.17 \right)$$

$$GL = 0.006 \text{ grain/dscf} < 0.1 \text{ grain/dscf}$$

Therefore, compliance with District Rule 4201 requirements is expected and a permit condition will be listed on the steam generator permits as follows:

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

**District Rule 4301 Fuel Burning Equipment**

This rule specifies maximum emission rates in lb/hr for SO<sub>2</sub>, NO<sub>2</sub>, and combustion contaminants (defined as total PM in Rule 1020). This rule also limits combustion contaminants to ≤ 0.1 gr/scf. According to AP 42 (Table 1.4-2, footnote c), all PM emissions from natural gas combustion are less than 1 μm in diameter.



District Rule 4301 Limits			
Pollutant	NO <sub>2</sub>	Total PM	SO <sub>2</sub>
S-6848-12-1 (lb/hr)	0.7	0.2	0.2
Rule Limit (lb/hr)	140	10	200

The above table indicates compliance with the maximum lb/hr emissions in this rule; therefore, continued compliance is expected.

### **District Rule 4304 - Equipment Tuning Procedure for Boilers, Steam Generators and Process Heaters**

Pursuant to District Rules 4305, 4306 and 4320 Section 6.3.1, the steam generators are not required to tune since it follows a District approved Alternate Monitoring scheme where the applicable emission limits are periodically monitored. Therefore, the steam generators are not subject to this rule.

### **District Rule 4305 Boilers, Steam Generators and Process Heaters – Phase 2**

The unit is natural gas, LPG and TEOR fired with a maximum heat input of 85 MMBtu/hr. Pursuant to Section 2.0 of District Rule 4305, the unit is subject to District Rule 4305, *Boilers, Steam Generators and Process Heaters – Phase 2*.

In addition, the unit is also subject to District Rule 4320, Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr. Since emissions limits of District Rule 4306 and all other requirements are equivalent or more stringent than District Rule 4305 requirements, compliance with District Rule 4320 requirements will satisfy requirements of District Rule 4305.

### **District Rule 4306 Boilers, Steam Generators and Process Heaters – Phase 3**

The unit is natural gas, LPG and TEOR fired with a maximum heat input of 85 MMBtu/hr. Pursuant to Section 2.0 of District Rule 4306, the unit is subject to District Rule 4306, *Boilers, Steam Generators and Process Heaters – Phase 3*.

Since emissions limits of District Rule 4320 and all other requirements are equivalent or more stringent than District Rule 4306 requirements, compliance with District Rule 4320 requirements will satisfy requirements of District Rule 4306.

### **Rule 4320 – Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr**

#### **Section 5.0 Requirements**

Section 5.1 of the rule requires compliance with the NO<sub>x</sub> and CO emissions limits listed in Table 1 of Section 5.2 or payment of an annual emissions fee to the District as specified in Section 5.3 and compliance with the control requirements specified in Section 5.4; or as stated in Section 5.1.3, comply with the applicable Low-use Unit requirements of Section 5.5.

**Section 5.2 NOx and CO Emission Limits**

Oilfield Steam Generators

<b>Rule 4320 Emissions Limits</b>				
<b>Category</b>	<b>Operated on gaseous fuel</b>		<b>Operated on liquid fuel</b>	
	<b>NO<sub>x</sub> Limit</b>	<b>CO Limit</b>	<b>NO<sub>x</sub> Limit</b>	<b>CO Limit</b>
1. Units with a total rated heat input >20.0 MMBtu/hr	Standard Schedule 7 ppmv or 0.008 lb/MMBtu; or	400 ppmv @ 3% O <sub>2</sub>	40 ppmv or 0.052 lb/MMBtu	400 ppmv @ 3% O <sub>2</sub>
	Staged Enhanced Schedule Initial limit: 9 ppmv @ 3% O <sub>2</sub> , 0.011 lb/MMBtu			
	Final limit: 5 ppmv @ 3% O <sub>2</sub> , 0.0062 lb/MMBtu			

the proposed NOx emission factor is 7 ppmvd @ 3% O<sub>2</sub> (0.0108 lb/MMBtu), and  
-the proposed CO emission factors are 30 ppmvd @ 3% O<sub>2</sub>

Therefore, as both the proposed NOx and CO emissions factors meet the limits of the rule, compliance with Section 5.1 of District Rule 4320 is expected.

A permit condition listing the emissions limits will be listed on permit as shown in the DEL section above.

**Section 5.3 Annual Fee Calculation**

Applicant has proposed to meet the emissions limits requirements of Section 5.1 and therefore this section is not applicable.

**Section 5.4 Particulate Matter Control Requirements**

Section 5.4 of the rule requires one of four options for control of particulate matter: 1) combustion of PUC-quality natural gas, commercial propane, butane, or liquefied petroleum gas, or a combination of such gases, 2) limit fuel sulfur content to no more than five (5) grains of total sulfur per one hundred (100) standard cubic, 3) install and properly operate an emission control system that reduces SO<sub>2</sub> emissions by at least 95% by weight; or limit exhaust SO<sub>2</sub> to less than or equal to 9 ppmv corrected to 3.0% O<sub>2</sub> or 4) refinery units, which require modification of refinery equipment to reduce sulfur emissions, shall be in compliance with the applicable requirement in Section 5.4.1 no later than July 1, 2013.

The new steam generator has a sulfur emissions limit of 0.00285 lb SO<sub>2</sub>/MMBtu (1.0 gr S/100scf) and will be in compliance with the SO<sub>x</sub>/PM<sub>10</sub> requirements of Section 5.4.1.2 of the rule which states the following:

*5.4.1.2 On and after the applicable NO<sub>x</sub> 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*

### **Section 5.5 Low Use**

Section 5.5 requires that units limited to less than or equal to 1.8 billion Btu per calendar year heat input pursuant to a District Permit to Operate Tune the unit at least twice per calendar year, or if the unit does not operate throughout a continuous six-month period within a calendar year, only one tune-up is required for that calendar year. No tune-up is required for any unit that is not operated during that calendar year; this unit may be test fired to verify availability of the unit for its intended use, but once the test firing is completed the unit shall be shutdown; or operate the unit in a manner that maintains exhaust oxygen concentrations at less than or equal to 3.00 percent by volume on a dry basis.

The subject steam generators are not a low use unit and therefore the requirements of Section 5.5 do not apply.

### **Section 5.7, Monitoring Provisions**

Section 5.7 requires either use of a APCO approved Continuous Emissions Monitoring System (CEMS) for NO<sub>x</sub>, CO, and oxygen, or implementation of an APCO-approved Alternate Monitoring System consisting of:

- 5.7.1.1 Periodic NO<sub>x</sub> and CO exhaust emission concentrations,
- 5.7.1.2 Periodic exhaust oxygen concentration,
- 5.7.1.3 Flow rate of reducing agent added to exhaust,
- 5.7.1.4 Catalyst inlet and exhaust temperature,
- 5.7.1.5 Catalyst inlet and exhaust oxygen concentration,
- 5.7.1.6 Periodic flue gas recirculation rate, or
- 5.7.1.7 Other operational characteristics.

In order to satisfy the requirements of District Rule 4320, the applicant has proposed to use pre-approved alternate monitoring scheme A (pursuant to District Policy SSP-1105), which requires that monitoring of NO<sub>x</sub>, CO, and O<sub>2</sub> exhaust concentrations shall be conducted at least once per month (in which a source test is not performed) using a portable analyzer. The following conditions will be incorporated into the permit in order to ensure compliance with the requirements of the proposed alternate monitoring plan:

- {4063} The permittee shall monitor and record the stack concentration of NO<sub>x</sub>, CO, and O<sub>2</sub> at least once every month (in which a source test is not performed) using a portable analyzer 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, 4306, and 4320]

- {4064} If either the NO<sub>x</sub> or CO concentrations corrected to 3% O<sub>2</sub>, 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, 4306, and 4320]
- {4065} 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, 4306, and 4320]
- {4066} The permittee shall maintain records of: (1) the date and time of NO<sub>x</sub>, CO, and O<sub>2</sub> measurements, (2) the O<sub>2</sub> concentration in percent by volume and the measured NO<sub>x</sub> and CO concentrations corrected to 3% O<sub>2</sub>, (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, 4306, and 4320]

### **5.7.6 Monitoring SO<sub>x</sub> Emissions**

Section 5.7.6.1 Operators complying with Sections 5.4.1.1 or 5.4.1.2 shall provide an annual fuel analysis to the District unless a more frequent sampling and reporting period is included in the Permit To Operate. Sulfur analysis shall be performed in accordance with the test methods in Section 6.2.

Section 5.7.6.2 Operators complying with Section 5.4.1.3 by installing and operating a control device with 95% SO<sub>x</sub> reduction shall propose the key system operating parameters and frequency of the monitoring and recording. The monitoring option proposed shall be submitted for approval by the APCO. This option is not proposed and therefore the section is not applicable.

Section 5.7.6.3 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. Source tests shall be performed in accordance with the test methods in Section 6.2. Semi-annual testing of sulfur is required for the new steam generators as stated below.

### Sulfur Monitoring

The following conditions will be included on the ATC for the steam generator which is authorized to combust natural gas, propane and TEOR gas:

- The unit shall only be fired on gaseous fuel that includes PUC quality natural gas, propane, and gas produced during thermally enhanced oil recovery (TEOR) operation or a mixture of any of these fuels. [District Rules 2201 and 4320]
- Sulfur content in PUC quality natural gas, and gas produced during thermally enhanced oil recovery (TEOR) shall not exceed 1.0 grain per 100 dry standard cubic feet. [District Rules 2201, 4301, and 4320]
- Sulfur content in propane fuel shall not exceed 2.5 grain per 100 dry standard cubic feet. [District Rules 2201, 4301, and 4320]
- If the unit is fired on noncertified gaseous fuel and compliance with SO<sub>x</sub> 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 3246, D 4084, D 4468, D 6667 or grab sample analysis by GC-FPD/TCD or double GC performed in the laboratory. [District Rule 1070, 2201, 2520, and 4320]]
- When complying with sulfur emission limits by fuel analysis or by a combination of source testing and fuel analysis, each fuel source shall be tested weekly for sulfur content and higher heating value. If compliance with the fuel sulfur content limit and sulfur emission limits has been demonstrated for 8 consecutive weeks for a fuel source, then the fuel testing frequency shall be quarterly. If a quarterly fuel content source test fails to show compliance, weekly testing shall resume. [District Rules 1070, 2201, 2520, and 4320]
- If fuel analysis is used to demonstrate compliance with conditions of this permit, the fuel higher heating value for each fuel shall be certified by a third party fuel supplier or determined by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rules 1070, 2201, 2520, and 4320]

### **Section 5.8, Compliance Determination**

Section 5.8.1 requires that the operator of any unit shall have the option of complying with either the applicable heat input (lb/MMBtu) emission limits or the concentration (ppmv) emission limits specified in Section 5.2. The emission limits selected to demonstrate compliance shall be specified in the source test proposal pursuant to Rule 1081 (Source Sampling) as stated in the following ATC condition:

- {2976} The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305, 4306, and 4320]

Section 5.8.2 requires that all emissions measurements 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.

- {2972} 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, 4306, and 4320]

Section 5.8.3 Continuous Emissions Monitoring System (CEMS) emissions measurements shall be averaged over a period of 15 consecutive minutes to demonstrate compliance with the applicable emission limits. Any 15-consecutive-minute block average CEMS measurement exceeding the applicable emission limits shall constitute a violation. The steam generators are not equipped with CEMs and therefore this section is not applicable.

Section 5.8.4 For emissions monitoring pursuant to Sections 5.7.1, and 6.3.1 using a portable NOx analyzer as part of an APCO approved Alternate Emissions Monitoring System, emission readings 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 readings evenly spaced out over the 15-consecutive-minute period.

- {2937} 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, 4306, and 4320]

Section 5.8.5 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 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.

- {2980} 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.

A permit condition will be listed on the permit as follows:

- {2983} 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]

Section 6.1.1 requires that a unit operated under the exemption of Section 4.2 shall monitor and record, for each unit, the cumulative annual hours of operation. The units are not Section 4.2 exempt and therefore these records are not required.

Section 6.1.2 requires the operator of any unit that is subject to the requirements of Section 5.5 shall record the amount of fuel use at least on a monthly basis for each unit. On and after the applicable compliance schedule specified in Section 7.0, in the event that such unit exceeds the applicable annual heat input limit specified in Section 5.5, the unit shall be brought into full compliance with this rule as specified in Section 5.2 Table 1. The units are not low use and therefore these records are not necessary.

Section 6.1.3 The operator of any unit subject to Section 5.5.1 or Section 6.3.1 shall maintain records to verify that the required tune-up and the required monitoring of the operational characteristics of the unit have been performed. The units are not low use and therefore these records are not necessary.

Section 6.1.4 The operator performing start-up or shutdown of a unit shall keep records of the duration of start-up or shutdown. The following condition is included on the ATC:

- Permittee shall maintain a record of the duration of each startup and shutdown of this unit. [District Rules 4305, 4306, and 4320]

Section 6.1.5 The operator of any unit firing on liquid fuel during a PUC-quality natural gas curtailment period pursuant to Section 5.4.2 shall record the sulfur content of the fuel, amount of fuel used, and duration of the natural gas curtailment period. The unit is not authorized to combust liquid fuel. Therefore this section is not applicable.

**Section 6.2, Test Methods**

Section 6.2 identifies the following test methods as District-approved source testing methods for the pollutants listed:

Pollutant	Units	Test Method Required
NO <sub>x</sub>	ppmv	EPA Method 7E or ARB Method 100
NO <sub>x</sub>	lb/MMBtu	EPA Method 19
CO	ppmv	EPA Method 10 or ARB Method 100
Stack Gas O <sub>2</sub>	%	EPA Method 3 or 3A, or ARB Method 100
Stack Gas Velocities	ft/min	EPA Method 2
Stack Gas Moisture Content	%	EPA Method 4
Oxides of sulfur		EPA Method 6C, EPA Method 8, or ARB Method 100
Total Sulfur as Hydrogen Sulfide (H <sub>2</sub> S) Content		EPA Method 11 or EPA Method 15, as appropriate.
Sulfur Content of Liquid Fuel		ASTM D 6920-03 or ASTM D 5453-99

The following test method conditions are included on the ATCs:

- {2977} NO<sub>x</sub> emissions for source test purposes shall be determined using EPA Method 7E or ARB Method 100 on a ppmv basis, or EPA Method 19 on a heat input basis. [District Rules 4305, 4306, and 4320]
- {2978} CO emissions for source test purposes shall be determined using EPA Method 10 or ARB Method 100. [District Rules 4305, 4306, and 4320]
- {2979} Stack gas oxygen (O<sub>2</sub>) shall be determined using EPA Method 3 or 3A or ARB Method 100. [District Rules 4305, 4306, and 4320]

Section 6.2.8.2. The SO<sub>x</sub> emission control system efficiency shall be determined using the following:

$$\% \text{ Control Efficiency} = [(C_{\text{SO}_2, \text{inlet}} - C_{\text{SO}_2, \text{outlet}}) / C_{\text{SO}_2, \text{inlet}}] \times 100$$

where:

C<sub>SO<sub>2</sub>, inlet</sub> = concentration of SO<sub>x</sub> (expressed as SO<sub>2</sub>) at the inlet side of the SO<sub>x</sub> emission control system, in lb/dscf



$C_{SO_2, \text{outlet}}$  = concentration of SO<sub>x</sub> (expressed as SO<sub>2</sub>) at the outlet side of the SO<sub>x</sub> emission control system, in lb/dscf

The units are not equipped with a SO<sub>2</sub> scrubber. Therefore this section is not applicable.

### Section 6.3 Compliance Testing

Section 6.3.1 requires that this unit be tested to determine compliance with the applicable requirements of section 5.2 not less than once every 12 months (no more than 30 days before or after the required annual source test date). Upon demonstrating compliance on two consecutive compliance source tests, the following source test may be deferred for up to thirty-six months.

Section 6.3.1.1 Units that demonstrate compliance on two consecutive 12-month source tests may defer the following 12-month source test for up to 36 months (no more than 30 days before or after the required 36-month source test date). During the 36-month source testing interval, the operator shall tune the unit in accordance with the provisions of Section 5.5.1, and shall monitor, on a monthly basis, the unit's operational characteristics recommended by the manufacturer to ensure compliance with the applicable emission limits specified in Section 5.2.

Section 6.3.1.2 Tune-ups required by Sections 5.5.1 and 6.3.1 do not need to be performed for units that operate and maintain an APCO approved CEMS or an APCO approved Alternate Monitoring System where the applicable emission limits are periodically monitored. Applicant has proposed to monitor the emissions of NO<sub>x</sub> and CO Alternate Monitoring Scheme "A" and therefore tuning is not required.

Section 6.3.1.3 If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits specified in Section 5.2, the source testing frequency shall revert to at least once every 12 months.

The following conditions are included on the ATC:

- {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]
- {3466} Source testing to measure NO<sub>x</sub> and CO emissions from this unit while fired on natural gas shall be conducted at least once every twelve (12) months. After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months. 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, 4306, and 4320]
- {110} The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

Sections 6.3.2.1 through 6.3.2.7 address the requirements of group testing which is not applicable for this project.

#### **Section 6.4, Emission Control Plan (ECP)**

Section 6.4.1 requires that the operator of any unit shall submit to the APCO for approval an Emissions Control Plan according to the compliance schedule in Section 7.0 of District Rule 4320.

The proposed units are in compliance with the emissions limits listed in Table 1, Section 5.1 of this rule and with periodic monitoring and source testing requirements. Therefore, this current application for the new proposed unit satisfies the requirements of the Emission Control Plan, as listed in Section 6.4 of District Rule 4320. No further discussion is required.

#### **Section 7.0, Compliance Schedule**

Section 7.0 indicates that an operator with multiple units at a stationary source shall comply with this rule in accordance with the schedule specified in Table 1, Section 5.2 of District Rule 4320.

The units will be in compliance with the emissions limits listed in Table 1, Section 5.2 of this rule, and periodic monitoring and source testing as required by District Rule 4320. Therefore, requirements of the compliance schedule, as listed in Section 7.1 of District Rule 4306, are satisfied. No further discussion is required.

#### **Conclusion**

Conditions are included on the ATCs in order to ensure compliance with each section of this rule, see attached draft permit(s). Therefore, compliance with District Rule 4320 requirements is expected.

#### **District Rule 4351 Boilers, Steam Generators and Process Heaters – Phase 1**

This rule applies to boilers, steam generators, and process heaters at NO<sub>x</sub> Major Sources that are not located west of Interstate 5 in Fresno, Kings, or Kern counties. The facility is located west of Interstate 5 in Kern County. Therefore, this rule does not apply.

#### **Rule 4405 Oxides of Nitrogen Emissions from Existing Steam Generators Used in Thermally Enhanced Oil Recovery – Central and Western Kern County Fields**

This rule limits NO<sub>x</sub> emissions to 0.14 lb/MMBTU for existing steam generators located in Kern County. This steam generator is considered a new steam generator and is not subject to this rule and a limit of 0.14 lb-NO<sub>x</sub>/MMBTU.

In addition, the unit in this project is also subject to District Rule 4320, *Advanced Emission Reduction Options for Boilers, Steam Generators, and Process heaters Greater than 5.0*

MMBTU/hr. Since emissions limits of District Rule 4320 and all other requirements are equivalent or more stringent than District Rule 4405 requirements, compliance with District Rule 4320 requirements will satisfy requirements of District Rule 4405.

**Rule 4406 - Sulfur Compounds from Oil-Field Steam Generators - Kern County**

This rule limits sulfur compound emissions from existing steam generators used in oil field operations prior to September 12, 1979. The limit imposed by the rule is 0.11 lb S/MMBtu, either individually or on average basis for all of an operators steam generators subject to the rule requirements. The authorized SOx emission factor (0.00285 lb/MMBtu) is well below the rule limit. Therefore, compliance this rule is expected.

**District Rule 4801 Sulfur Compounds**

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<sub>2</sub>, on a dry basis averaged over 15 consecutive minutes.

Using the ideal gas equation and the emission factors presented in Section VII, the sulfur compound emissions are calculated as follows:

$$\text{Volume SO}_2 = \frac{n RT}{P}$$

With:

N = moles SO<sub>2</sub>

T (Standard Temperature) = 60°F = 520°R

P (Standard Pressure) = 14.7 psi

R (Universal Gas Constant) =  $\frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot ^\circ\text{R}}$

$$\frac{0.00285 \text{ lb} - \text{SO}_x}{\text{MMBtu}} \times \frac{\text{MMBtu}}{8,578 \text{ dscf}} \times \frac{1 \text{ lb} \cdot \text{mol}}{64 \text{ lb}} \times \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot ^\circ\text{R}} \times \frac{520^\circ\text{R}}{14.7 \text{ psi}} \times \frac{1,000,000 \cdot \text{parts}}{\text{million}} = 1.97 \frac{\text{parts}}{\text{million}}$$

$$\text{Sulfur Concentration} = 1.97 \frac{\text{parts}}{\text{million}} < 2,000 \text{ ppmv (or 0.2\%)}$$

Therefore, compliance with District Rule 4801 requirements is expected.

**California Health & Safety Code 42301.6 (School Notice)**

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

## **California Environmental Quality ACT (CEQA)**

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 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; and
- 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.

## **Greenhouse Gas (GHG) Significance Determination**

It is determined that no other agency has prepared or will prepare an environmental review document for the project. Thus the District is the Lead Agency for this project.

On December 17, 2009, the District's Governing Board adopted a policy, APR 2005, *Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*, for addressing GHG emission impacts when the District is Lead Agency under CEQA and approved the District's guidance document for use by other agencies when addressing GHG impacts as lead agencies under CEQA. Under this policy, the District's determination of significance of project-specific GHG emissions is founded on the principal that projects with GHG emission reductions consistent with AB 32 emission reduction targets are considered to have a less than significant impact on global climate change. Consistent with District Policy 2005, projects complying with an approved GHG emission reduction plan or GHG mitigation program, which avoids or substantially reduces GHG emissions within the geographic area in which the project is located, would be determined to have a less than significant individual and cumulative impact for GHG emission.

The California Air Resources Board (ARB) adopted a Cap-and-Trade regulation as part one of the strategies identified for AB 32. This Cap-and-Trade regulation is a statewide plan, supported by a CEQA compliant environmental review document, aimed at reducing or mitigating GHG emissions from targeted industries. Facilities subject to the Cap-and-Trade regulation are subject to an industry-wide cap on overall GHG emissions. Any growth in emissions must be accounted for under that cap such that a corresponding and equivalent reduction in emissions must occur to allow any increase. Further, the cap decreases over time, resulting in an overall decrease in GHG emissions.

Under District policy APR 2025, *CEQA Determinations of Significance for Projects Subject to ARB's GHG Cap-and-Trade Regulation*, the District finds that the Cap-and-Trade is a regulation plan approved by ARB, consistent with AB32 emission reduction targets, and

supported by a CEQA compliant environmental review document. As such, consistent with District Policy 2005, projects complying project complying with Cap-and-Trade requirements are determined to have a less than significant individual and cumulative impact for GHG emissions.

Facility S-6848 is subject to the Cap-and-Trade regulation. All fuel gasses burned at 9522 Oilfield Road in Bakersfield, CA are currently reported to CARB as a requirement of AB32. In particular, the report to ARB includes waste gases (TEOR gas) burned in the boiler units evaluated. Therefore, as discussed above, consistent with District Policies APR 2005 and APR 2025, the District concludes that the GHG emissions increases associated with this project would have a less than significant individual and cumulative impact on global climate change.

**IX. Recommendation**

Compliance with all applicable rules and regulations is expected. Issue Authority to Construct S-6848-12-1 subject to the permit conditions on the attached draft Authority to Construct in Appendix C.

**X. Billing Information**

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
S-6848-12-1	3020-02-H	85 MMBtu/hr	\$953.00

**Appendices**

- A: AAQA/HRA
- B: Compliance Certification
- C: Draft ATC
- D: CO2e Calculations
- E: Propane Fuel Test Analysis
- F: BACT

# **APPENDIX A**

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AAQA/HRA

**San Joaquin Valley Air Pollution Control District  
Risk Management Review  
\*\*\*REVISED\*\*\***

To: Thom Maslowski, AQE – Permit Services  
 From: Joe Aguayo, AQS – Technical Services  
 Date: February 11, 2014  
 Facility Name: Occidental of Elk Hills  
 Location: SE/4 Section: 35, Township: 30S, Range: 22E  
 Application #(s): S-6848-12-1  
 Project #: S-1133056

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**A. RMR SUMMARY**

<b>RMR Summary</b>			
<b>Categories</b>	<b>85 MMBtu/hr NG-fired generator (Unit 12-1)</b>	<b>Project Totals</b>	<b>Facility Totals</b>
<b>Prioritization Score</b>	0.0	0.0	<1.0
<b>Acute Hazard Index</b>	N/A <sup>1</sup>	N/A	N/A
<b>Chronic Hazard Index</b>	N/A <sup>1</sup>	N/A	N/A
<b>Maximum Individual Cancer Risk (10<sup>-6</sup>)</b>	N/A <sup>1</sup>	N/A	N/A
<b>T-BACT Required?</b>	<b>No</b>		
<b>Special Permit Conditions?</b>	<b>No</b>		

<sup>1</sup> This project passed on prioritization; no further analysis is required.

**Proposed Permit Conditions**

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

Unit # 12-1

No special conditions are required.

**B. RMR REPORT**

**i. Project Description**

Technical Services received a request on February 11, 2014, to revise an Ambient Air Quality Analysis and a Risk Management Review for an 85 MMBtu/hr NG-fired steam generator. The applicant modified the proposed PM10 emission factor to the AP 42 value to avoid source testing.

## II. Analysis

Toxic emissions for this proposed unit were calculated using emission factors for external combustion sources. In accordance with the District's *Risk Management Policy for Permitting New and Modified Sources* (APR 1905, March 2, 2001), risks from the proposed unit's toxic emissions were prioritized using the procedure in the 1990 CAPCOA Facility Prioritization Guidelines and incorporated in the District's HEARTs database. The prioritization score for this proposed unit was less than 1.0 (see RMR Summary Table). Therefore, no further analysis was necessary.

The following parameters were used for the review:

<b>Analysis Parameters Unit 12-1</b>			
<b>Throughput (MMscf/yr)</b>	744.6	<b>Max Hours per Year</b>	8760
<b>Closest Receptor (m)</b>	402		

Technical Services performed modeling for criteria pollutants CO, NO<sub>x</sub>, SO<sub>x</sub> and PM<sub>10</sub>; as well as a RMR. The emission rates used for criteria pollutant modeling were 1.87 lb/hr CO, 0.72 lb/hr NO<sub>x</sub>, 0.24 lb/hr SO<sub>x</sub>, and 0.65 lb/hr PM<sub>10</sub>. The engineer supplied the maximum fuel rate for the steam generators used during the analysis.

The results from the Criteria Pollutant Modeling are as follows:

### Criteria Pollutant Modeling Results\*

Diesel ICE	1 Hour	3 Hours	8 Hours	24 Hours	Annual
CO	Pass	X	Pass	X	X
NO <sub>x</sub>	Pass	X	X	X	Pass
SO <sub>x</sub>	Pass	Pass	X	Pass	Pass
PM <sub>10</sub>	X	X	X	Pass <sup>1</sup>	Pass <sup>1</sup>

\*Results were taken from the attached PSD spreadsheet.

<sup>1</sup>The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2).

## III. Conclusion

The prioritization score is less than 1.0. In accordance with the District's **Risk Management Policy**, the project is approved without Toxic Best Available Control Technology (T-BACT).

The emissions from the proposed equipment will not cause or contribute significantly to a violation of the State and National AAQS.

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:**

- A. RMR request from the project engineer
- B. Additional information from the applicant/project engineer
- C. Toxic emissions summary
- D. Prioritization score
- E. AAQA Results

# **APPENDIX B**

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## **Compliance Certification**

RECEIVED  
JUL 19 2013  
SJVAPCD  
Southern Region

## San Joaquin Valley Unified Air Pollution Control District

### TITLE V MODIFICATION - COMPLIANCE CERTIFICATION FORM

**I. TYPE OF PERMIT ACTION** (Check appropriate box)

- SIGNIFICANT PERMIT MODIFICATION                       ADMINISTRATIVE  
 MINOR PERMIT MODIFICATION                                       AMENDMENT

COMPANY NAME: OCCIDENTAL OF ELK HILLS, INC.	FACILITY ID: S - 6848
1. Type of Organization: <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Sole Ownership <input type="checkbox"/> Government <input type="checkbox"/> Partnership <input type="checkbox"/> Utility	
2. Owner's Name: OCCIDENTAL OF ELK HILLS, INC.	
3. Agent to the Owner: OCCIDENTAL OF ELK HILLS, INC.	

**II. COMPLIANCE CERTIFICATION** (Read each statement carefully and initial all circles for confirmation):

- Based on information and belief formed after reasonable inquiry, the equipment identified in this application will continue to comply with the applicable federal requirement(s).
- Based on information and belief formed after reasonable inquiry, the equipment identified in this application will comply with applicable federal requirement(s) that will become effective during the permit term, on a timely basis.
- Corrected information will be provided to the District when I become aware that incorrect or incomplete information has been submitted.
- Based on information and belief formed after reasonable inquiry, information and statements in the submitted application package, including all accompanying reports, and required certifications are true accurate and complete.

I declare, under penalty of perjury under the laws of the state of California, that the forgoing is correct and true:

  
Signature of Responsible Official

7/19/2013  
Date

Armando Gonzalez

Name of Responsible Official (please print)

Health, Environmental and Safety Manager

Title of Responsible Official (please print)

Mailing Address: Central Regional Office • 1990 E. Gettysburg Avenue • Fresno, California 93726-0244 • (559) 230-5900 • FAX (559) 230-6061

TVFORM-009  
Rev. July 2005

# **APPENDIX C**

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Draft ATC

San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

ISSUANCE DATE: DRAFT  
**DRAFT**

PERMIT NO: S-6848-12-1

LEGAL OWNER OR OPERATOR: OCCIDENTAL OF ELK HILLS INC  
MAILING ADDRESS: ATTN: DENNIS CHAMPION  
PO BOX 1001  
TUPMAN, CA 93276

LOCATION: HEAVY OIL WESTERN

SECTION: SE 35 TOWNSHIP: 30S RANGE: 22E

**EQUIPMENT DESCRIPTION:**

85 MMBTU/HR NATURAL GAS/PROPANE/TEOR-FIRED STEAM GENERATOR WITH MAGNA-FLAME LE BURNER (OR EQUIVALENT) AND FLUE GAS RECIRCULATION

**CONDITIONS**

1. This Authority to Construct (ATC) cancels and supersedes Authority to Construct (ATC) S-6848-12-0. [District Rule 2201] Federally Enforceable Through Title V Permit
2. 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] Federally Enforceable Through Title V Permit
3. 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
4. Prior to operating equipment under this Authority to Construct, permittee shall surrender NOX emission reduction credits for the following quantity of emissions: 1st quarter - 1582 lb, 2nd quarter - 1582 lb, 3rd quarter - 1582 lb, and fourth quarter - 1582 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201] Federally Enforceable Through Title V Permit
5. Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter - 1117 lb, 2nd quarter - 1117 lb, 3rd quarter - 1117 lb, and fourth quarter - 1117 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 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

S-6848-12-1; Feb 12 2014 4:53PM - MABLOWBT : Joint Inspection NOT Required

6. ERC Certificate numbers S-2824-2, S-1704-1 and S-1708-1 (or a certificate split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
7. The permittee shall obtain written District approval for the use of any equivalent equipment not specifically approved by this Authority to Construct. Approval of the equivalent equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate equipment is equivalent to the specifically authorized equipment. [District Rule 2201] Federally Enforceable Through Title V Permit
8. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2201] Federally Enforceable Through Title V Permit
9. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
10. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201] Federally Enforceable Through Title V Permit
11. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
12. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit
13. 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] Federally Enforceable Through Title V Permit
14. The unit shall only be fired on gaseous fuel that includes PUC quality natural gas, propane and gas produced during thermally enhanced oil recovery (TEOR) operation or a mixture of any of these fuels. [District Rule 2201] Federally Enforceable Through Title V Permit
15. Sulfur content in PUC quality natural gas and gas produced during thermally enhanced oil recovery (TEOR) shall not exceed 1.0 grain per 100 dry standard cubic feet. [District Rules 2201, 4301, and 4320] Federally Enforceable Through Title V Permit
16. Sulfur content in propane fuel shall not exceed 2.5 grain per 100 dry standard cubic feet. [District Rules 2201, 4301, and 4320] Federally Enforceable Through Title V Permit
17. Emission rates shall not exceed: PM10: 0.005 lb/MMBtu, VOC: 0.006 lb/MMBtu, 7 ppmvd NOx @ 3% O2 or 0.0085 lb-NOx/MMBtu, or CO: 30 ppmv @ 3% O2 or 0.022 lb-CO/MMBtu. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
18. When complying with sulfur emission limits by fuel analysis or by a combination of source testing and fuel analysis, each fuel source shall be tested weekly for sulfur content and higher heating value. If compliance with the fuel sulfur content limit and sulfur emission limits has been demonstrated for 8 consecutive weeks for a fuel source, then the fuel testing frequency shall be quarterly. If a quarterly fuel content source test fails to show compliance, weekly testing shall resume. When fired on propane fuel, weekly demonstration is not required and operator shall retain all third party fuel supplier analyses on site. [District Rule 1070, 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
19. Testing to demonstrate compliance with the sulfur content limit is not required when the unit is fired on PUC certified gas. [District Rule 2201] Federally Enforceable Through Title V Permit
20. Testing to demonstrate compliance with the sulfur content limit is not required when the unit is fired on propane. Operator shall maintain fuel analyses for all propane shipments. [District Rule 2201] Federally Enforceable Through Title V Permit

**DRAFT**  
CONDITIONS CONTINUE ON NEXT PAGE

21. 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, double GC for H<sub>2</sub>S and mercaptans, performed in the laboratory. Should the applicant decide to use different methodology, the methodology must be approved by the District prior to its use. [District Rule 1070, 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
22. 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 Rule 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
23. Source testing to measure fuel combustion NO<sub>x</sub> and CO emissions from this unit shall be conducted within 60 days of initial start-up. Source test shall be conducted using a gas mixture including PUC-quality natural gas and the expected amounts of thermally enhanced oil recovery (TEOR) gas for PM<sub>10</sub> emissions testing. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
24. The permittee shall monitor and record the stack concentration of NO<sub>x</sub>, CO, and O<sub>2</sub> 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 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
25. If either the NO<sub>x</sub> or CO concentrations corrected to 3% O<sub>2</sub>, 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 performing the notification and testing required by this condition. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
26. 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 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
27. The permittee shall maintain records of: (1) the date and time of NO<sub>x</sub>, CO, and O<sub>2</sub> measurements, (2) the O<sub>2</sub> concentration in percent and the measured NO<sub>x</sub> and CO concentrations corrected to 3% O<sub>2</sub>, (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 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
28. 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 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
29. Source testing to measure NO<sub>x</sub> and CO emissions from this unit shall be conducted at least once every twelve (12) months. After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months. 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 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
30. The source test plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rule 4305, 4306 and 4320] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

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. NOx emissions for source test purposes shall be determined using EPA Method 7E or ARB Method 100 on a ppmv basis, or EPA Method 19 on a heat input basis. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
33. CO emissions for source test purposes shall be determined using EPA Method 10 or ARB Method 100. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
34. Stack gas oxygen (O2) shall be determined using EPA Method 3 or 3A or ARB Method 100. [District Rules 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
35. 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 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit
36. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit
37. 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, 2201, 4305, 4306, and 4320] Federally Enforceable Through Title V Permit

DRAFT



# **APPENDIX D**

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## **CO2e Emissions Calculations**

The CO2e emissions from combustion units only are calculated in the table below.

**Assumptions:**

Operating schedule is 8,760 hrs/year unless otherwise limited on the permit.

All units are fired on natural gas.

CO2e emission factor for natural gas= 52.92 kg/MMBtu = 0.058 short tons/MMBtu

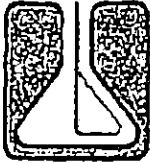
Permit Unit	Permitted		CO2e (short tons)
	MMBtu/hr	MMBtu/year	
S-1327- 32 -8	36	315,360	18,385
S-1327- 34 -6	23	201,480	11,746
S-1327- 35 -3	62.5	547,500	31,919
S-1327- 41 -2	4.25	37,230	2,171
S-1327- 83 -1	83	399	23
S-1327- 116 -1	25	219,000	12,768
S-1327- 120 -1	23	201,480	11,746
S-1327- 130 -1	85	655	38
S-1327- 131 -1	85	655	38
S-1327- 132 -1	85	655	38
S-1327- 133 -1	85	655	38
S-1327- 134 -1	85	655	38
S-1327- 135 -1	85	655	38
S-1327- 136 -1	85	655	38
S-1327- 137 -1	25	219,000	12,768
S-1327- 138 -1	25	219,000	12,768
S-1327- 155 -3	85	655	38
S-1327- 196 -0	18	157,680	9,193
S-6848- 196 -0	85	744,600	43,187

Total CO2e (short tons)	166,978
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# **APPENDIX E**

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## **Propane Fuel Test Analysis**



ZALCO LABORATORIES, INC.  
Analytical & Consulting Services

4309 Armour Avenue  
Bakersfield, California 93308

(661) 395-0539  
FAX (661) 395-3069

Vintage Production California LLC - 2 8600 Ming Avenue Ste 300 Bakersfield CA 93311-1373	Project Master Project # Attention George Chedige	Work Order No.: 1703321 Reported 03/27/07 Received 03/27/07 09:45
--	---	---

Lab Sample ID: 1703321-01 Client Sample ID: Dry Skid at Propane Truck Rack	Collected By: Armando Rubio Date Collected: 3/27/07 8:50 AM
---	--

Analyte	Results	POC	Units	Flag	Method	Date Prepared	Date Analyzed	Init.
<b>Total Sulfur/Hydrogen Sulfide by ASTM D3246</b>								
Hydrogen sulfide	2.6	1.0	ppm		ASTM D 3246M	3/27/07	3/27/07	JAH
Sulfur	0.51	0.05	gr/100 sd		ASTM D3246	3/27/07	3/27/07	JAH

Quality Control data is available upon request

NCP: Non-Hazardous Sample P: Specific Analyte Hold Time TLLC: Total Threshold Limit Concentration STLC: Soluble Threshold Limit Concentration TOLP: Toxicity Chart details

Note: Samples analyzed for regulatory purposes should be put on ice immediately after sampling and received by the laboratory at temperatures between 3-6°C. Microbiological analysis requires samples to be at level 4-10°C when received at the laboratory. For additional information regarding the limitations of the method(s) referred to, please call us at 661-395-0539

# **APPENDIX E**

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**BACT**

# BACT Analysis

## ❖ Top Down BACT Analysis for NO<sub>x</sub> Emissions:

### Step 1 - Identify All Possible Control Technologies

The District adopted District Rule 4320 on October 16, 2008. The NO<sub>x</sub> emission limit requirements in District Rule 4320 are lower than the current BACT limits; therefore a project specific BACT analysis will be performed to determine BACT for this project. District Rule 4320 includes a compliance option that limits oilfield steam generators with heat input ratings greater than 20 MMBtu/hr to 7 ppm @ 3% O<sub>2</sub>. This emission limit is Achieved in Practice control technology for the BACT analysis. District Rule 4320 also contains an enhanced schedule option that allows applicants additional time to meet the requirements of the rule. The enhanced schedule NO<sub>x</sub> emission limit requirement is 5 ppmv @ 3% O<sub>2</sub>. Since this is an enhanced option in the rule, it will be considered the Technologically Feasible control technology for the BACT analysis.

The SJVUAPCD BACT Clearinghouse Guideline 1.2.1 has been rescinded. Therefore a new BACT analysis is required. The following are possible control technologies:

1. 7 ppmvd @ 3% O<sub>2</sub> - Achieved in Practice.
2. 5 ppmvd @ 3% O<sub>2</sub> with SCR – Technologically Feasible

### Step 2 - Eliminate Technologically Infeasible Options

None of the above listed technologies are technologically infeasible.

### Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. 7 ppmvd @ 3% O<sub>2</sub> - Achieved in Practice.
2. 5 ppmvd @ 3% O<sub>2</sub> with SCR – Technologically Feasible

### Step 4 - Cost Effectiveness Analysis

A cost effective analysis is required for technologically feasible control options that are not proposed. The applicant has proposed 7 ppmvd NO<sub>x</sub> @ 3% O<sub>2</sub>; therefore, a cost effective analysis is required for the 5 ppmvd NO<sub>x</sub> @ 3% O<sub>2</sub> with Selective Catalytic Reduction option.

### SCR Cost Effectiveness Analysis

#### Assumptions:

Industry standard (IS) assumed to be a NO<sub>x</sub> emission rate of 15 ppmv @ 3% O<sub>2</sub> in accordance with District Rule 4306.

Unit's maximum emissions are defined by the burner size multiplied by the emissions factor and a maximum annual operating schedule of 8,760 hr/year.

Calculations:

$$\text{Industrial Standard NOx Emissions} = 85 \text{ MMBtu/hr} \times 0.018 \text{ lb/MMBtu} \times 8760 \text{ hrs/year} \\ = 13,403 \text{ lb/year}$$

$$\text{Technologically Feasible NOx Emissions} = 85 \text{ MMBtu/hr} \times 0.006 \text{ lb/MMBtu} \times 8760 \\ \text{hrs/year} \\ = 4,468 \text{ lb/year}$$

Selective Catalytic Reduction system (Detailed costs follow the BACT Analysis Section):

Capital Cost (SCR Vendor & TJ Cross): **\$1,102,046** (includes all purchased equipment, taxes, freight, and installation for a 62.5 MMBtu/hr unit) – detailed costs follow.

Total Estimated Capital Cost: **\$1,102,046**

Equivalent Annual Capital Cost (Capital Recovery)

$$A = P \frac{i(1+i)^n}{(1+i)^n - 1} \quad \text{where;}$$

A = Equivalent Annual Control Equipment Capital Cost

P = Present value of the control equipment, including installation cost

i = interest rate (use 10%, or demonstrate why alternate is more representative of the specific operation).

n = equipment life (assume 10 years or demonstrate why alternate is more representative of the specific operation)

Where

$$P = \$1,102,046$$

$$i = 10\%$$

$$n = 10 \text{ years}$$

$$A = \$179,303$$

Because the capital recovery and annual costs of ammonia, catalyst replacement, and energy (\$179,303/yr + \$35,583/yr + \$10,512/yr = \$225,398) correspond to a 62.5 MMBtu/hr unit they are adjusted using the "6/10" rule as follows:

$$\$225,398 \times (85/62.5)^{0.6} = \$271,064/\text{yr}$$

$$\text{Operation and Maintenance Labor} = \$7875/\text{yr} + \$1181/\text{yr}$$



Indirect annual costs =  $\$2 \times 13,120 + 4725$   
=  $\$30,965$   
Total annualized cost =  $\$311,085/\text{yr}$

**NOx Reduction due to Selective Catalytic Reduction system:**

Total reduction = Emissions<sub>15 ppm</sub> - Emissions<sub>5 ppm</sub>  
Total reduction = 13,403 lb/year - 4468 lb/year  
Total reduction = 8,935 lb/year = 4.5 ton NOx per year

**Cost effectiveness:**

Cost effectiveness =  $\$311,085 / 4.47 \text{ tpy}$   
Cost effectiveness =  $\$69,594 / \text{ton}$

The cost effectiveness is greater than the \$24,500/ton cost effectiveness threshold of the District BACT policy. Therefore the use of SCR with ammonia injection is not cost effective and is not required as BACT.

**Step 5 - Select BACT**

BACT is satisfied by the applicant's proposal to meet a NOx limit of 7 ppmvd @ 3% O<sub>2</sub> to be achieved with a Low NO<sub>x</sub> burner and flue gas recirculation (FGR).

❖ **Top Down BACT Analysis for VOC Emissions:**

**Step 1 - Identify all control technologies**

The SJVUAPCD BACT Clearinghouse guideline 1.2.1, 3rd quarter 2008, identifies achieved in practice and technologically feasible BACT for Steam Generator  $\geq 5$  MMbtu/hr, at an oil field as follows:

1. Gaseous fuel - achieved in practice

**Step 2 - Eliminate Technologically Infeasible Options**

The above listed technology is technologically feasible.

**Step 3 - Rank Remaining Control Technologies by Control Effectiveness**

1. Gaseous fuel - achieved in practice

**Step 4 - Cost Effectiveness Analysis**

Only one control technology identified and this technology is achieved in practice, therefore, cost effectiveness analysis not necessary.

**Step 5 - Select BACT for VOC**

The use of gaseous fuel (natural gas) is selected as BACT for VOC emissions.

❖ **Top Down BACT Analysis for PM<sub>10</sub> and SO<sub>x</sub> Emissions:**

**Step 1 - Identify all control technologies**

The SJVUAPCD BACT Clearinghouse guideline 1.2.1, 3rd quarter 2007, identifies achieved in practice and technologically feasible BACT for Steam Generator  $\geq 5$  MMbtu/hr, at an oil field as follows:

1. Fired on PUC, quality natural gas, commercial propane, and/or LPG; gaseous fuel 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 dscf; or use of a continuously operating SO<sub>2</sub> scrubber and either achieving 95% by weight control of sulfur compounds or achieving and emission rate of 9 ppmvd SO<sub>2</sub> at stack O<sub>2</sub> - achieved in practice

**Step 2 - Eliminate Technologically Infeasible Options**

The above listed technology is technologically feasible.

**Step 3 - Rank Remaining Control Technologies by Control Effectiveness**

1. Fired on PUC, quality natural gas, commercial propane, and/or LPG; gaseous fuel 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 dscf; or use of a continuously operating SO<sub>2</sub> scrubber and either achieving 95% by weight control of sulfur compounds or achieving and emission rate of 9 ppmvd SO<sub>2</sub> at stack O<sub>2</sub> - achieved in practice

**Step 4 - Cost Effectiveness Analysis**

Only one control technology identified and this technology is achieved in practice, therefore, cost effectiveness analysis not necessary.

**Step 5 - Select BACT for SO<sub>x</sub> and PM<sub>10</sub>**

The use of natural gas and commercial propane and TEOR fuel with a sulfur content not to exceed 1.0 gr-S/100 scf is selected as BACT for SO<sub>x</sub> and PM<sub>10</sub> emissions.