San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

MAY 06 2013

Dan Martin
E & J Gallo Winery
18000 W River Rd
Livingston, CA 95334

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: N-1237
Project Number: N-1121959

Dear Mr. Martin:

Enclosed for your review and comment is the District's analysis of E & J Gallo Winery's application for an Authority to Construct for installation of two cogeneration (heat and electric) systems each equipped with 1,393 bhp Cummins Model QSK60G lean burn digester gas-fired internal combustion (IC) engine with selective catalytic reduction with ammonia injection, at 18000 W River Rd, Livingston.

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. After addressing all comments made during the 30-day public notice and 45-day EPA notice comment periods, the District intends to issue the Authority to Construct. Please submit your written comments on this project within the 30-day public comment period, as specified in the enclosed public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Stanley Tom of Permit Services at (559) 230- 5900.

Sincerely,

David Warner
Director of Permit Services

DW:st

Enclosures

cc: Mike Tollstrup, CARB (w/ enclosure) via email
cc: Gerardo C. Rios, EPA (w/ enclosure) via email

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Executive Director/Air Pollution Control Officer

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4800 Enterprise Way
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Newspaper notice for publication in Merced Sun-Star and for posting on valleyair.org

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NOTICE OF PRELIMINARY DECISION
FOR THE PROPOSED ISSUANCE OF
AN AUTHORITY TO CONSTRUCT

NOTICE IS HEREBY GIVEN that the San Joaquin Valley Unified Air Pollution Control District solicits public comment on the proposed issuance of Authority to Construct to E & J Gallo Winery for installation of two cogeneration (heat and electric) systems each equipped with 1,393 bhp Cummins Model QSK60G lean burn digester gas-fired internal combustion (IC) engine with selective catalytic reduction with ammonia injection., at 18000 W River Rd, Livingston.

The analysis of the regulatory basis for this proposed action, Project #N-1121959, is available for public inspection at http://www.valleyair.org/notices/public_notices_idx.htm and at any District office. For additional information, please contact the District at (559) 230-6000. Written comments on this project must be submitted by June 5, 2013 to **DAVID WARNER, DIRECTOR OF PERMIT SERVICES, SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT, 1990 EAST GETTYSBURG AVENUE, FRESNO, CA 93726.**

San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Cogeneration System Consisting of Two Digester Gas-Fired IC Engines

Facility Name:	E & J Gallo Winery	Date:	May 2, 2013
Mailing Address:	18000 W River Rd Livingston, CA 95334	Engineer:	Stanley Tom
		Lead Engineer:	Joven Refuerzo
Contact Person:	Dan Martin		
Telephone:	(209) 394-6211		
Application No:	N-1237-605-0 and '606-0		
Project No:	N-1121959		
Deemed Complete:	July 30, 2012		

I. Proposal

E & J Gallo Winery has requested Authority to Construct (ATC) permits for the installation of two cogeneration (heat and electric) systems each equipped with 1,393 bhp Cummins Model QSK60G lean burn digester gas-fired internal combustion (IC) engine with non-selective catalytic reduction and selective catalytic reduction with ammonia injection.

The proposed equipment will be used to generate up to 2 MW of electricity to be used onsite to offset a portion of the current power usage from the local utility power grid. The plant will be equipped to handle various types of feedstock substrates including winery and distillery wastewater and pomace. An anaerobic digester system will generate digester gas which will be sent to two cogeneration engines to produce electricity.

The digester gas will contain hydrogen sulfide (H_2S) which is produced during the anaerobic digestion process. A desulfurization unit consisting of a two phase biogas scrubber will be utilized to reduce H_2S. The scrubber system will consist of a liquid biological oxidation gas wet scrubber using sulfur oxidizing bacteria followed by two activated carbon adsorption polishing filters.

The operation will also include anaerobic digester system served by a flare (see project N-1123806). The anaerobic digester system served by a flare and the digester gas-fired IC engines will be considered as a single permitting action. The facility has proposed to permit the IC engines initially so that the equipment can be procured at the outset to minimize project delays.

E & J Gallo Winery has received their Title V Permit. This modification can be classified as a Title V significant modification pursuant to Rule 2520, Section 3.29, and can be processed with a Certificate of Conformity (COC). But the facility has not requested that this project be processed in that manner; therefore, the facility will be required to submit a Title V significant modification application prior to operating under the revised provisions of the ATC(s) issued with this project. The facility may commence construction under the ATCs while the Title V significant modification is processed.

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 4002 National Emissions Standards for Hazardous Air Pollutants (5/20/04)
Rule 4101 Visible Emissions (2/17/05)
Rule 4102 Nuisance (12/17/92)
Rule 4201 Particulate Matter Concentration (12/17/92)
Rule 4701 Internal Combustion Engines (8/21/03)
Rule 4702 Internal Combustion Engines – Phase 2 (8/18/11)
Rule 4801 Sulfur Compounds (12/17/92)
CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notice
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

II. Project Location

The facility is located at 18000 W River Rd in Livingston, CA. 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.

III. Process Description

E & J Gallo Winery is proposing to construct and operate a digester gas operation at the existing winery in Livingston, CA. The project will be a wastewater treatment and energy recovery project called Livingston Water Innovation and Energy (L-WINE). This permitting project is for the IC engines and the rest of the digester gas operation has been applied for separately under project N-1123806.

Anaerobic digestion of winery and distillery wastewater and pomace will create digester gas. The digester gas will be used by two cogeneration engines that will produce electricity and heat. The produced heat from the engines will be recovered to aid in the digestion process. The digester operation will operate 24 hours per day and 365 days per year.

V. Equipment Listing

N-1237-605-0: 1,393 BHP CUMMINS MODEL QSK60G LEAN BURN DIGESTER GAS-FIRED IC ENGINE WITH TURBOCHARGER, INTERCOOLER, AIR/FUEL RATIO CONTROLLER, NON-SELECTIVE CATALYTIC REDUCTION AND SELECTIVE CATALYTIC REDUCTION WITH AMMONIA INJECTION COGENERATION SYSTEM SERVED BY A TWO PHASE SULFUR SCRUBBER SYSTEM CONSISTING OF ONE LIQUID BIOLOGICAL OXIDATION WET SCRUBBER AND TWO ACTIVATED CARBON ADSORPTION POLISHING FILTERS SHARED WITH PERMIT N-1237-606

N-1237-606-0: 1,393 BHP CUMMINS MODEL QSK60G LEAN BURN DIGESTER GAS-FIRED IC ENGINE WITH TURBOCHARGER, INTERCOOLER, AIR/FUEL RATIO CONTROLLER, NON-SELECTIVE CATALYTIC REDUCTION AND SELECTIVE CATALYTIC REDUCTION WITH AMMONIA INJECTION COGENERATION SYSTEM SERVED BY A TWO PHASE SULFUR SCRUBBER SYSTEM CONSISTING OF ONE LIQUID BIOLOGICAL OXIDATION WET SCRUBBER AND TWO ACTIVATED CARBON ADSORPTION POLISHING FILTERS SHARED WITH PERMIT N-1237-605

VI. Emission Control Technology Evaluation

Sulfur Scrubber

Hydrogen sulfide (H_2S) is present in the digester gas produced during anaerobic digestion due to the degradation sulfur containing compounds present in the feedstock. In the cogeneration engines, H_2S reacts with water to form sulfuric acid (H_2SO_4) which is highly corrosive.

The digester system is expected to generate biogas with a concentration of H2S of about 3,000 ppmv. The biogas will be piped from the digesters, dewatered, and sent through a two phase biogas scrubber system. The system is comprised of 1) a liquid biological oxidation gas wet scrubber using sulfur oxidizing bacteria followed by 2) an activated carbon adsorption polishing filter. The biogas will first enter the wet scrubber system (also known as trade name Bio-Sulfurix) where the majority of the H2S is removed from the biogas in a biological oxidation process. The biogas then enters an activated carbon adsorption filter for further removal of the H2S to levels below 40 ppmv.

The Bio-Sulfurix system removes H2S from the biogas by a group of sulfur oxidizing bacteria. The liquid temperature is maintained by the internal heat exchanger of the scrubber tower receiving supplementary heat. The system is also designed with a clean-in-place operation which uses water and compressed air for thorough washing and scouring of the packing removing both scale and excess biomass. The residual product from the biological process is a liquid sulfate solution which is discharged to the fields as a fertilizer.

The Bio-Sulfurix consists of two main items: a Process Technique Unit and acid proof tank. The Process Technique Unit contains the circulation/drain pump, air blower, water supply control, heating control, and PLC switchboard for controlling the process. The tank has internal piping for controlling the biogas and filter liquid and is filled with packing media for the purpose of providing surface for the bacteria culture.

The activated carbon adsorption polishing filters are equipped with an activated carbon which is microporous and inert carbon with a large internal surface area. This surface area is capable of adsorbing contaminated organic molecules from liquids and gases. The facility will operate the units in series but when breakthrough occurs, one unit will be taken out of service for regeneration while the other remains in service. At least one unit shall be in operation at all times.

IC Engine

The engines are equipped with:
[X] Turbocharger
[X] Intercooler
[ ] Positive Crankcase Ventilation (PCV) or 90% efficient crankcase emission control device
[X] Air/Fuel Ratio Controller
[X] Lean Burn Technology
[X] Non-Selective Catalytic Reduction
[X] Selective Catalytic Reduction

The engine is equipped with a 90% efficient crankcase emission control device which reduces VOC and PM10 emissions by at least 90% over an uncontrolled crankcase.

The turbocharger reduces the NO_X emission rate from the engine by approximately 10% by increasing the efficiency and promoting more complete burning of the fuel.

The intercooler functions in conjunction with the turbocharger to reduce the inlet air temperature. By reducing the inlet air temperature, the peak combustion temperature is lowered, which reduces the formation of thermal NO_X. NO_X emissions are reduced by approximately 15% with this control technology.

The fuel/air ratio controller (oxygen controller) is used to maintain the amount of oxygen in the exhaust stream to optimize catalyst function.

Lean burn technology increases the volume of air in the combustion process and therefore increases the heat capacity of the mixture. This technology also incorporates improved swirl patterns to promote thorough air/fuel mixing. This in turn lowers the combustion temperature and reduces NO_X formation.

Non-Selective Catalytic Reduction (NSCR) decreases NOx, CO and VOC emissions by using a catalyst to promote the chemical reduction of NOx into N2 and O2, and the chemical oxidation of VOC and CO into H2O and CO2.

A Selective Catalytic Reduction (SCR) system operates as an external control device where flue gases and a reagent, in this case ammonia, are passed through an appropriate catalyst. Ammonia, will be injected upstream of the catalyst where it reacts and reduces NO_X, over the catalyst bed, to form elemental nitrogen and other by-products. The use of a catalyst typically reduces the NO_X emissions by up to 90%.

VII. General Calculations

A. Assumptions

- Operation schedule = 24 hr/day and 8,400 hours/year (per applicant)
- Digester gas heating value = 900 Btu/scf (per applicant)
- Digester gas F-factor = 9,800 dscf/MMBtu (per applicant)

- Post desulfurization unit digester gas H_2S concentration = 40 ppmv (per applicant based on BACT limit)
- Engine exhaust flow rate = 6,460 cfm (per applicant)
- BHP to Btu/hr conversion: 2,542.5 Btu/bhp-hr
- Thermal efficiency of engine: commonly ≈ 35%

B. Emission Factors

The following emission factors are for each engine after the SCR treatment.

Engine Digester Gas Fuel			
Pollutant	g/hp-hr	ppmv @ 15% O_2	Source
NO_X	0.15	11	Manufacturer Guarantee
SO_X	0.025		Mass balance equation below based on BACT limit of 40 ppmv H_2S in fuel
PM_{10}	0.033		AP-42 (7/00) Table 3.2-2*
CO	0.8	96.2	Manufacturer Guarantee
VOC	0.10	21	Manufacturer Guarantee

$$\left(\frac{40\ ft^3 - H_2S}{10^6\ ft^3 - fuel}\right)\left(\frac{scf\ fuel}{900\ Btu}\right)\left(\frac{2{,}542.5\ Btu}{bhp - hr}\right)\left(\frac{1\ bhp\ input}{0.35\ bhp\ output}\right)\left(\frac{lb - mol\ H_2S}{379.5\ scf\ H_2S}\right)\left(\frac{lb - mol\ SO_2}{lb - mol\ H_2S}\right)\left(\frac{64\ lb\ SO_2}{lb - mol\ SO_2}\right)\left(\frac{453.6\ g}{lb}\right) = 0.025\ \frac{g - SO_2}{bhp - hr}$$

* PM_{10} value includes both filterable (7.71×10^{-5} lb/MMBtu) and condensable (9.91×10^{-3} lb/MMBtu) emissions.

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Since these are new emission units, PE1 = 0.

2. Post Project Potential to Emit (PE2)

Daily Engine Emissions

The following emission rates are for each engine after the SCR treatment.

Daily Post-Project Emissions – Each Engine (Digester Gas Fuel)					
Pollutant	Emissions Factor (g/bhp-hr)	Rating (bhp)	Daily Hours of Operation (hrs/day)	Conversion (g/lb)	PE2 Total (lb/day)
NO_X	0.15	1,393	24	453.6	11.1
SO_X	0.025	1,393	24	453.6	1.8
PM_{10}	0.033	1,393	24	453.6	2.4
CO	0.8	1,393	24	453.6	59.0
VOC	0.10	1,393	24	453.6	7.4
NH_3					4.2

Ammonia

Ammonia (NH_3) emissions will be emitted by the operation of the SCR system. The proposed daily NH_3 emissions are calculated as follows:

PE = ppm x MW x (2.64×10^{-9}) x exhaust flow rate x 1440 min/day

Where:

- ppm is the emission concentration in ppmvd @ 15% O_2 = 10
- MW is the molecular weight of the pollutant (MW_{NH3} = 17 lb/lb-mol)
- 2.64 x 10^{-3} is the inverse of the molar specific volume (lb-mol/scf, at 60 °F)
- Exhaust flow rate = 6,460 scf/min (per manufacturer)
- engine is operated a maximum of 1440 min/day and 8,400 hours/year

NH_3 PE (lb/day) = 10×10^{-6} x 17 x (2.64×10^{-3}) (lb-mol/scf) x 6,460 (scf/min) x 1440 (min/day)
= 4.2 lb-NH_3/day

Annual Engine Emissions

Annual Post-Project Emissions – Each Engine (Digester Gas Fuel)					
Pollutant	Emissions Factor (g/bhp-hr)	Rating (bhp)	Annual Hours of Operation (hrs/year)	Conversion (g/lb)	PE2 Total (lb/year)
NO_X	0.15	1,393	8,400	453.6	3,869
SO_X	0.025	1,393	8,400	453.6	645
PM_{10}	0.033	1,393	8,400	453.6	851
CO	0.8	1,393	8,400	453.6	20,637
VOC	0.10	1,393	8,400	453.6	2,580
NH_3					1,461

Ammonia

The proposed annual NH_3 emissions are calculated as follows:

PE = ppm x MW x (2.64×10^{-9}) x exhaust flow rate x 1440 min/day x 365 day/year

NH_3 PE (lb/year) = 10×10^{-6} x 17 x (2.64×10^{-3}) (lb-mol/scf) x 6,460 (scf/min) x 60 (min/hr) x 8,400 hr/year
= 1,461 lb-NH_3/year

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

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

This facility acknowledges that its VOC emissions are already above the Offset and Major Source Thresholds; therefore, SSPE calculations for VOC are not necessary and permit units that only emit VOC will not be shown in the SSPE calculations below.

Pre-Project Stationary Source Potential to Emit [SSPE1] (lb/year)					
Permit Unit	NO_X	SO_X	PM_{10}	CO	VOC
N-1237-1-2	0	0	0	0	-
N-1237-3-8	1,080	86	150	4,440	-
N-1237-4-13	12,994	3,760	6,570	194,472	-
N-1237-5-2	0	0	528	0	-
N-1237-6-3	0	0	73	0	-
N-1237-7-2	0	0	0	0	-
N-1237-8-2	0	0	0	0	-
N-1237-9-2	0	0	0	0	-
N-1237-10-2	0	0	0	0	-
N-1237-12-2*	3,942	431	146 + 116 = 262	552	-
N-1237-17-2	0	0	657	0	-
N-1237-480-3	0	0	14	0	-
N-1237-596-0	0	0	99	0	-
N-1237-601-0	0	0	7	0	-
N-1237-602-0	0	0	115	0	-
N-1237-603-0	0	0	115	0	-
$SSPE1_{Permit\ Unit}$	18,016	4,277	8,590	199,464	> 20,000
ERC N-2-2	19,838	0	0	0	-
ERC N-2-3	0	0	0	407,020	-
$Total_{ERC}$	19,838	0	0	407,020	-
Pre-Project SSPE (SSPE1)	37,854	4,277	8,590	606,484	> 20,000

* N-1237-12-2

Emissions from the 3 MMBtu/hr LPG-fired incinerator are shown below:

NOx = 0.15 lb/MMBtu x 3 MMBtu/hr x 8760 hr/year = 3,942 lb/year
SOx = 0.0164 lb/MMBtu x 3 MMBtu/hr x 8760 hr/year = 431 lb/year
PM_{10} = 0.0044 lb/MMBtu x 3 MMBtu/hr x 8760 hr/year = 116 lb/year
CO = 0.021 lb/MMBtu x 3 MMBtu/hr x 8760 hr/year = 552 lb/year

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

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

Post-Project Stationary Source Potential to Emit [SSPE2] (lb/year)					
Permit Unit	NO_X	SO_X	PM_{10}	CO	VOC
N-1237-1-2	0	0	0	0	-
N-1237-3-8	1,080	86	150	4,440	-
N-1237-4-13	12,994	3,760	6,570	194,472	-
N-1237-5-2	0	0	528	0	-
N-1237-6-3	0	0	73	0	-
N-1237-7-2	0	0	0	0	-
N-1237-8-2	0	0	0	0	-
N-1237-9-2	0	0	0	0	-
N-1237-10-2	0	0	0	0	-
N-1237-12-2	3,942	431	146 + 116 = 262	552	-
N-1237-17-2	0	0	657	0	-
N-1237-480-3	0	0	14	0	-
N-1237-596-0	0	0	99	0	-
N-1237-601-0	0	0	7	0	-
N-1237-602-0	0	0	115	0	-
N-1237-603-0	0	0	115	0	-
N-1237-605-0	3,869	645	851	20,637	2,580
N-1237-606-0	3,869	645	851	20,637	2,580
N-1237-661-0	3,266	408	435	16,330	147
$SSPE2_{Permit\ Unit}$	29,020	5,975	10,292	257,068	> 20,000
ERC N-2-2	19,838	0	0	0	-
ERC N-2-3	0	0	0	407,020	-
$Total_{ERC}$	19,838	0	0	407,020	-
Post-Project SSPE (SSPE2)	48,858	5,975	10,292	664,088	> 20,000

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_X	SO_X	PM_{10}	CO	VOC
Pre-Project SSPE (SSPE1)	18,016	4,277	8,590	199,464	> 20,000
Post-Project SSPE (SSPE2)	29,020	5,975	10,292	257,068	> 20,000
Major Source Threshold	20,000	140,000	140,000	200,000	20,000
Major Source?	Yes	No	No	Yes	Yes

As seen in the table above, the facility is an existing Major Source for VOC and is becoming a Major Source for NOx and CO as a result of this project.

Rule 2410 Major Source Determination:

The following table summarizes the potential VOC emissions from previous permitting actions for this stationary source prior to the proposed project.

Project Number	Proposed Permitting Actions	PE (lb-VOC/year)
N-1072605	Applying for In-house PTOs for existing wine storage and fermentation tanks	470,985
N-1110129	Install 2 wine fermentation tanks	8,432
N-1110722	Convert 7 existing grape juice tanks to wine fermentation tanks	15,680
N-1113344	Install 104 wine storage and fermentation tanks	94,430
N-1113395	Install 3 wine storage and fermentation tanks	10,173
N-1113047	Install 2 distilled spirit tanks	188
N-1113864	Install an ethanol evaporator system	7,719
Total		**607,607**

As indicated above, the SSPE VOC emission before the proposal project is calculated to 607,607 pounds per year, equivalent to 303.8 tons per year.

The facility 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 threshold for VOC is applicable.

PSD Major Source Determination (tons/year)	
	VOC
Facility PE before Project Increase	303.8
PSD Major Source Thresholds	250
PSD Major Source?	**Yes**

As shown above, the facility is an existing Major Source for PSD for VOC. 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 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 District Rule 2201.

Since these are new emission units, BE = PE1 = 0 for all pollutants.

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."

SOx and PM_{10}

Since this facility is not a Major Source for SOx, or PM_{10}, this project does not constitute an SB 288 Major Modification for SOx or PM_{10}.

NOx

Since this facility is not an existing major source for NOx but is becoming a major source for NOx, the project's PE2 is compared to the SB 288 Major Modification Threshold in the following table in order to determine if the SB 288 Major Modification is triggered.

SB 288 Major Modification Threshold			
Pollutant	Project PE2 (lb/year)	Threshold (lb/year)	SB 288 Major Modification?
NOx	3,869 x 2 = 7,738	50,000	No

Since the SB 288 Major Modification Threshold is not surpassed, this project does not constitute an SB 288 Major Modification NOx.

VOC

Since this facility is an existing major source for 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 Threshold			
Pollutant	Project PE2 (lb/year)	Threshold (lb/year)	SB 288 Major Modification Calculation Required?
VOC	2,580 x 2 = 5,160	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 Federal Major Modifications are the same as "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

SOx and PM_{10}

Since this facility is not an existing Major Source for NOx, SOx or PM_{10}, this project does not constitute a Federal Major Modification for NOx, SOx or PM_{10}. Additionally, since the facility is not a major source for PM_{10} (140,000 lb/year), it is not a major source for $PM_{2.5}$ (200,000 lb/year).

NOx

For facilities that are not an existing Major Source, Federal Major Modification is triggered if the project increase in emissions is greater than the Major Source threshold.

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

Federal Major Modification Threshold			
Pollutant	Total Emissions Increases (lb/year)	Threshold (lb/year)	Federal Major Modification?
NO_x	7,738	20,000	No

Since none of the Federal Major Modification Thresholds are being surpassed with this project, this project does not constitute a Federal Major Modification for NOx and no further analysis is required.

VOC

A Less-Than-Significant Emissions Increase exclusion is for an emissions increase for the project, or a Net Emissions Increase for the project (as defined in 40 CFR 51.165 (a)(2)(ii)(B) through (D), and (F)), that is not significant for a given regulated NSR pollutant, and therefore is not a federal major modification for that pollutant.

- To determine the post-project projected actual emissions from existing units, the provisions of 40 CFR 51.165 (a)(1)(xxviii) shall be used.
- To determine the pre-project baseline actual emissions, the provisions of 40 CFR 51.165 (a)(1)(xxxv)(A) through (D) shall be used.
- If the project is determined not to be a federal major modification pursuant to the provisions of 40 CFR 51.165 (a)(2)(ii)(B), but there is a reasonable possibility that the project may result in a significant emissions increase, the owner or operator shall comply with all of the provisions of 40 CFR 51.165 (a)(6) and (a)(7).
- Emissions increases calculated pursuant to this section are significant if they exceed the significance thresholds specified in the table below.

Significant Threshold (lb/year)	
Pollutant	Threshold (lb/year)
NOx	0
VOC	0

The Net Emissions Increases (NEI) for purposes of determination of a "Less-Than-Significant Emissions Increase" exclusion will be calculated below to determine if this project qualifies for such an exclusion.

Net Emission Increase for New Units (NEI_N)

Per 40 CFR 51.165 (a)(2)(ii)(D) for new emissions units in this project,

$NEI_N = PE2_N - BAE$

Since these are new units, BAE for these units is zero and,

$NEI_N = PE2_N$

where $PE2_N$ is the Post Project Potential to Emit for the new emissions units.

Net Emissions Increase (NEI)		
Permit	NOx (lb/year)	VOC (lb/year)
N-1237-605-0	3,869	2,580
N-1237-606-0	3,869	2,580
Total	7,738	5,160

The NEI for this project will be greater than the federal Major Modification threshold for VOC. Therefore, this project does not qualify for a "Less-Than-Significant Emissions Increase" exclusion and is thus determined to be a Federal Major Modification for VOC.

9. Rule 2410 – Prevention of Significant Deterioration

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

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

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.

Greenhouse Gas Emissions Evaluation

The District has evaluated potential greenhouse gas emissions from the internal combustion engine rated at 1,393 brake horsepower.

Basis and Assumptions

- The engine is fired on digester gas fuel.
- The engine operates at full rated power.
- BHP to Btu/hr conversion: 2,542.5 Btu/bhp-hr
- Thermal efficiency of engine: commonly ≈ 35%
- Engine operates 8,400 hours per year.
- Emission factors and global warming potentials (GWP) are taken from EPA 40 CFR Part 98, Subpart A, Tables C-1 and C-2:

CO2 52.07 kg/MMBtu (114.79 lb/MMBtu)
CH4 3.2×10^{-3} kg/MMBtu (0.00705 lb/MMBtu)
N2O 6.3×10^{-4} kg/MMBtu (0.00139 lb/MMBtu)

GWP for CH4 = 21 lb-CO2(eq) per lb-CH4
GWP for N2O = 310 lb-CO2(eq) per lb-N2O

Calculations

Hourly Emissions

CO2 Emissions = 1,393 bhp_{out} x 2,542.5 Btu_{in}/bhp_{in}-hr x 114.79 $lb/MMBtu_{in}$
x 1 $bhp_{in}/0.35\ bhp_{out}$
= 1,161.58 lb-CO2e/hour

CH4 Emissions = 1,393 bhp_{out} x 2,542.5 Btu_{in}/bhp_{in}-hr x 0.00705 $lb/MMBtu_{in}$ x 1 $bhp_{in}/0.35$ bhp_{out} x 21 lb-CO2e per lb-CH4
= 1.498 lb-CO2e/hour

N2O Emissions = 1,393 bhp_{out} x 2,542.5 Btu_{in}/bhp_{in}-hr x 0.00139 $lb/MMBtu_{in}$ x 1 $bhp_{in}/0.35$ bhp_{out} x 310 lb-CO2e per lb-N2O
= 4.36 lb-CO2e/hour

Total = 1,161.58 + 1.498 + 4.36 = 1,167.44 lb-CO2e/hour

Annual Emissions

1167.44 lb-CO2e/hour x 8,400 hr/year ÷ 2,000 lb/short ton = 4,903 short tons-CO2e/year

PSD Significant Emission Increase Determination: Potential to Emit (tons/year)						
	NO2	SO2	CO	PM	PM10	CO2e
Total PE from New and Modified Units	3.9	0.6	20.6	0.9	0.9	9,806
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.

10. Quarterly Net Emissions Change (QNEC)

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

QNEC = PE2 - PE1, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.
PE2 = Post Project Potential to Emit for each emissions unit, lb/qtr.
PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr.

Quarterly NEC [QNEC] (Each Engine)			
	PE2 (lb/qtr)	PE1 (lb/qtr)	QNEC (lb/qtr)
NO_X	967	0	967
SO_X	161	0	161
PM_{10}	213	0	213
CO	5,159	0	5,159
VOC	645	0	645

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 for the following*:

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 a Major Modification.

*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 above, the applicant is proposing to install a new digester gas-fired IC engine with a PE greater than 2 lb/day for NO_X, PM_{10}, CO, VOC and NH_3. BACT is triggered for NO_X, PM_{10}, CO, VOC and NH_3 since the PEs are greater than 2 lb/day and the SSPE2 for CO is greater than 200,000 lbs/year, as demonstrated in Section VII.C.5 above.

Digester Gas Fuel – Each Engine		
Pollutant	Daily PE2 (lb/day)	BACT Triggered?
NO_x	11.1	Yes
SO_x	1.8	No
PM_{10}	2.4	Yes
CO	59.0	Yes
VOC	7.4	Yes
NH_3	4.2	Yes

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 Section VII.C.8 above, this project does constitute a Federal Major Modification for VOC. Therefore BACT is triggered for VOC.

2. BACT Guideline

BACT Guideline 3.3.15, applies to the digester gas-fired IC engines. [Waste Gas-Fired I.C. Engine] (See Attachment A)

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 Attachment A), BACT has been satisfied with the following:

NO_X: NO_X emissions ≤ 0.15 g/bhp-hr
PM_{10}: Fuel sulfur content ≤ 40 ppmv (as H_2S)
VOC: VOC emissions ≤ 0.10 g/bhp-hr
NH_3: NH_3 emissions ≤ 10 ppmvd @ 15% O_2

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_X	SO_X	PM_{10}	CO	VOC
Post Project SSPE (SSPE2)	48,858	5,975	10,292	664,088	> 20,000
Offset Threshold	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	Yes	No	No	Yes	Yes

2. Quantity of Offsets Required

NOx Offset Calculations

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

The quantity of offsets in pounds per year 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) = (Σ[PE2 – BE] + ICCE) x 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

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)

There are no increases in cargo carrier emissions; therefore offsets can be determined as follows:

Offsets Required (lb/year) = (Σ[PE2 – BE]) x DOR

Offset Requirement – Each Engine	
Pollutant	NOx (lb/year)
PE2	3,869
BE	0
PE2 – BE	3,869

Calculating the appropriate quarterly emissions to be offset is as follows:

Quarterly Offset Requirement – Each Engine				
Pollutant	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
NOx	967	967	967	968

The project is a Federal Major Modification and therefore the offset ratio for NOx is 1.5:1.

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

Offset Requirement Summary (PE2 – BE) x DOR = 1.5 – Each Engine	
Permit	NOx (lb/year)
Total	3,869
Total x DOR	5,804

Calculating the appropriate quarterly emissions to be offset is as follows:

Quarterly Offset Requirement x DOR = 1.5 – Each Engine				
Pollutant	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
NOx	1,451	1,451	1,451	1,451

For both engines, the amount of offsets required is as follows:

Offset Requirement (PE2 – BE) – Both Engines	
Permit	NOx (lb/year)
N-1237-605-0	3,869
N-1237-606-0	3,869
Total	7,738

Calculating the appropriate quarterly emissions to be offset is as follows:

Quarterly Offset Requirement – Both Engines				
Pollutant	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
NOx	1,934	1,934	1,935	1,935

The project is a Federal Major Modification and therefore the offset ratio for NOx is 1.5:1.

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

Offset Requirement Summary (PE2 – BE) x DOR = 1.5 – Both Engines	
Permit	NOx (lb/year)
Total	7,738
Total x DOR	11,607

Calculating the appropriate quarterly emissions to be offset is as follows:

Quarterly Offset Requirement x DOR = 1.5 – Both Engines				
Pollutant	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
NOx	2,901	2,902	2,902	2,902

The applicant has stated that the facility plans to use ERC certificates N-2-2, N-849-2, N-972-2, N-1010-2, N-1011-2, N-1012-2 to offset the increases in emissions associated with this project. The above certificates have available quarterly credits as follows:

Proposed NOx ERC Certificates				
ERC Certificate #	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
N-2-2	2,587	2,434	7,175	7,642
N-849-2	0	14	111	0
N-1010-2	2,500	2,500	2,500	2,500
N-1011-2	625	625	625	625
N-1012-2	545	545	545	545
N-1061-2	9,980	9,980	10,939	9,979
Total	16,237	16,098	21,895	21,291

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

VOC Offset Calculations

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

The quantity of offsets in pounds per year 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) = (Σ[PE2 – BE] + ICCE) x 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

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)

There are no increases in cargo carrier emissions; therefore offsets can be determined as follows:

Offsets Required (lb/year) = (Σ[PE2 – BE]) x DOR

Offset Requirement – Each Engine	
Pollutant	VOC (lb/year)
PE2	2,580
BE	0
PE2 – BE	2,580

Calculating the appropriate quarterly emissions to be offset is as follows:

Quarterly Offset Requirement – Each Engine				
Pollutant	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
VOC	645	645	645	645

The project is a Federal Major Modification and therefore the offset ratio for VOC is 1.5:1.

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

Offset Requirement Summary (PE2 – BE) x DOR = 1.5 – Each Engine	
Permit	VOC (lb/year)
Total	2,580
Total x DOR	3,870

Calculating the appropriate quarterly emissions to be offset is as follows:

Quarterly Offset Requirement x DOR = 1.5 – Each Engine				
Pollutant	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
VOC	967	967	968	968

For both engines, the amount of offsets required is as follows:

Offset Requirement (PE2 – BE) – Both Engines	
Permit	VOC (lb/year)
N-1237-605-0	2,580
N-1237-606-0	2,580
Total	5,160

Calculating the appropriate quarterly emissions to be offset is as follows:

Quarterly Offset Requirement – Both Engines				
Pollutant	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
VOC	1,290	1,290	1,290	1,290

The project is a Federal Major Modification and therefore the offset ratio for VOC is 1.5:1.

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

Offset Requirement Summary (PE2 – BE) x DOR = 1.5 – Both Engines	
Permit	VOC (lb/year)
Total	5,160
Total x DOR	7,740

Calculating the appropriate quarterly emissions to be offset is as follows:

Quarterly Offset Requirement x DOR = 1.5 – Both Engines				
Pollutant	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
VOC	1,935	1,935	1,935	1,935

The applicant has stated that the facility plans to use ERC certificates N-2-1, S-3714-1, S-3805-1, S-3807-1, S-3808-1 to offset the increases in emissions associated with this project. The above certificates have available quarterly credits as follows:

Proposed VOC ERC Certificates				
ERC Certificate #	1st Qtr (lb/qtr)	2nd Qtr (lb/qtr)	3rd Qtr (lb/qtr)	4th Qtr (lb/qtr)
N-2-1	9	9	26	28
S-3733-1	79,675	79,675	79,675	79,671
S-3805-1	18,000	18,000	18,000	18,000
S-3807-1	11,431	11,424	11,417	11,417
S-3808-1	8,098	8,041	8,086	8,086
Total	117,213	117,149	117,204	117,202

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

CO-Offset Calculations:

CO offsets are triggered by CO emissions in excess of 200,000 lb/year for the facility.

However, pursuant to Section 4.6.1, "Emission Offsets shall not be required for the following: increases in carbon monoxide in attainment areas if the applicant demonstrates to the satisfaction of the APCO, that the Ambient Air Quality Standards are not violated in the areas to be affected, and such emissions will be consistent with Reasonable Further Progress, and will not cause or contribute to a violation of Ambient Air Quality Standards (AAQS)."

The Technical Services Section of the San Joaquin Valley Unified Air Pollution Control District performed a CO modeling run, using the EPA AERMOD air dispersion model, to determine if the CO emissions from the refractory curing equipment would exceed the State and Federal AAQS (Attachment B). Modeling of the worst case 1 hour and 8 hour CO impacts were performed. These values were added to the worst case ambient concentration (background) measured and compared to the ambient air quality standards. Results of the modeling are presented below:

Ambient Modeling Results for CO		
	1 hr std	**8 hr std**
AAQS (ug/m^3)	23,000	10,000
Worst case ambient (background) (ug/m^3)	2,214	1,398
Modeled impact (ug/m^3)	8.616	6.726
Modeled ambient CO (ug/m^3)	2,223	1,405

This modeling demonstrates that the proposed increase in CO emissions will not cause a violation of the CO ambient air quality standards. Therefore, the increase in CO emissions is exempt from offsets pursuant to Section 6.4.1.

Proposed Rule 2201 (offset) Conditions:

- Prior to operating equipment under this Authority to Construct, permittee shall surrender NO_X emission reduction credits for the following quantity of emissions: 1st quarter - 967 lb, 2nd quarter - 967 lb, 3rd quarter - 967 lb, and fourth quarter - 968 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 04/21/11). [District Rule 2201]
- Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter – 645 lb, 2nd quarter – 645 lb, 3rd quarter – 645 lb, and fourth quarter – 645 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 04/21/11). [District Rule 2201]
- ERC Certificate Numbers N-2-2, N-849-2, N-972-2, N-1010-2, N-1011-2, N-1012-2, N-2-1, S-3714-1, S-3805-1, S-3807-1, S-3808-1 (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]

C. Public Notification

1. Applicability

Public noticing is required for:
a. New Major Sources, Federal Major Modifications, and SB288 Major Modifications,
b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
c. Any project which results in the offset thresholds being surpassed, and/or
d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

a. New Major Sources, Federal Major Modifications, and SB288 Major Modifications

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

As demonstrated in VII.C.8, this project does constitute a Federal Major Modification for VOC; therefore, public noticing for Federal Major Modification purposes is required.

b. PE > 100 lb/day

The PE2 for each new unit is compared to the daily PE Public Notice thresholds in the following table:

PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO_X	11.1	100 lb/day	No
SO_X	1.8	100 lb/day	No
PM_{10}	2.4	100 lb/day	No
CO	59.0	100 lb/day	No
VOC	7.4	100 lb/day	No

Therefore, public noticing for PE > 100 lb/day purposes is not required.

c. Offset Threshold

The following table compares pollutant will trigger public noticing requirements. As seen 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_X	37,854	48,858	20,000 lb/year	No
SO_X	4,277	5,975	54,750 lb/year	No
PM_{10}	8,590	10,292	29,200 lb/year	No
CO	606,484	664,088	200,000 lb/year	No
VOC	> 20,000	> 20,000	20,000 lb/year	No

As detailed above, there were no thresholds surpassed with this project; therefore public noticing is not required for offset purposes.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a Stationary Source Increase in Permitted Emissions (SSIPE) of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE is calculated as the Post Project Stationary Source Potential to Emit (SSPE2) minus the Pre-Project Stationary Source Potential to Emit (SSPE1), i.e. SSIPE = SSPE2 – SSPE1. The values for SSPE2 and SSPE1 are calculated according to Rule 2201. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table:

Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice					
Pollutant	ΣProject PE2 (lb/year)	ΣProject PE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO_x	3,869 x 2 = 7,738	0	7,738	20,000 lb/year	No
SO_x	645 x 2 = 1,290	0	1,290	20,000 lb/year	No
PM_{10}	851 x 2 = 1,702	0	1,702	20,000 lb/year	No
CO	20,637 x 2 = 41,274	0	41,274	20,000 lb/year	Yes
VOC	2,580 x 2 = 5,160	0	5,160	20,000 lb/year	No

As demonstrated above, the SSIPE for CO is greater than 20,000 lb/year; therefore public noticing for SSIPE purposes is required.

2. Public Notice Action

As discussed above, public noticing is required for this project for Federal Major Modification for VOC and for SSIPE greater than 20,000 lb/year for CO. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB), US Environmental Protection Agency (US EPA), 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)

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

- Emissions from the IC engine when fired on digester gas, shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr, 0.025 g-SOx/bhp-hr (based on 40 ppmv sulfur content in fuel (as H_2S), 0.033 g-PM_{10}/bhp-hr, 0.8 g-CO/bhp-hr, or 0.10 g-VOC/bhp-hr. [District Rules 2201 and 4702, and 40 CFR 60 Subpart JJJJ]
- The ammonia (NH3) emission concentration shall not exceed 10 ppmvd @ 15% O_2. [District Rules 2201 and 4102]

E. Compliance Assurance

1. Source Testing

Pursuant to District Policy APR 1705, source testing is required to demonstrate compliance with Rule 2201.

As required by District Rule 4702, *Stationary Internal Combustion Engines - Phase 2*, this IC engine is subject to source testing requirements. Source testing requirements, in accordance with District Rule 4702, will be discussed in Section VIII, *District Rule 4702*, of this evaluation.

2. Monitoring

The following conditions will be placed on the permit to ensure compliance with the assumptions made for Rule 2201.

As required by District Rule 4702, *Stationary Internal Combustion Engines - Phase 2*, this IC engine is subject to monitoring requirements. Monitoring requirements, in accordance with District Rule 4702, will be discussed in Section VIII, *District Rule 4702*, of this evaluation.

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following condition will appear on the permit:

- All records shall be maintained and retained on-site for a period of at least 5 years and shall be made available for District inspection upon request. [District Rule 1070]

As required by District Rule 4702, *Stationary Internal Combustion Engines - Phase 2*, this IC engine is subject to recordkeeping requirements. Recordkeeping requirements, in accordance with District Rule 4702, will be discussed in Section VIII, *District Rule 4702*, of this evaluation.

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

An AAQA shall 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 District's Technical Services Division conducted the required analysis. Refer to Attachment B of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NOx, CO, and SOx. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for NOx, CO, or SOx.

The proposed location is in a non-attainment area for the state's PM10 as well as federal and state PM2.5 thresholds. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for PM10 and PM2.5.

G. Compliance Certification

Section 4.15.2 of this Rule requires the owner of a new Major Source or a source undergoing a Federal Major 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 Sections VIII-Rule 2201-C.1.a and VIII-Rule 2201-C.1.b, this source is undergoing a Federal Major Modification, therefore this requirement is applicable. Included in Attachment C is E & J Gallo's compliance certification.

H. Alternative Siting Analysis

Alternative siting analysis is required for any project, which constitutes a New Major Source or a Federal Major Modification.

In addition to winery tanks, the operation of a winery requires a large number support equipment, services and structures such as raw material receiving stations, crushers, piping, filtering and refrigeration units, warehouses, laboratories, bottling and shipping facilities, and administration buildings.

Since the current project involves no change to any other facets of the operation, 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 and facilities on a much greater scale, and would therefore result in a much greater impact.

Rule 2410 Prevention of Significant Deterioration

The prevention of significant deterioration (PSD) program is a construction permitting program for new major stationary sources and major modifications to existing major stationary sources located in areas classified as attainment or in areas that are unclassifiable for any criteria air pollutant.

As demonstrated above, this project is not subject to the requirements of Rule 2410 due to a significant emission increase and no further discussion is required.

Rule 2520 Federally Mandated Operating Permits

This facility is subject to this Rule, and has received their Title V Operating Permit. Section 3.29 defines a significant permit modification as a "permit amendment that does not qualify as a minor permit modification or administrative amendment."

Section 3.20.5 states that 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 is a Title I modification (i.e. Federal Major Modification), 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 pursuant to Section 3.29.

As discussed above, the facility has not applied for a Certificate of Conformity (COC); therefore, the facility must apply to modify their Title V permit with a Significant Modification prior to operating with the proposed modifications. Continued compliance with this rule is expected. The facility may commence construction under the ATCs while the Title V significant modification is processed.

40 CFR Part 64 – Compliance Assurance Monitoring (CAM)

Except for back-up utility units that are exempt under paragraph (b)(2), Section 64.2 states that the requirements of this subpart shall apply to a pollutant-specific emissions unit at a major source that is required to obtain a Part 70 or 71 permit if the unit satisfies all of the following criteria:

1) the unit must have an emission limit for the pollutant;
2) the unit must have add-on controls for the pollutant; these are devices such as flue gas recirculation (FGR), baghouses, catalytic oxidizers, etc; and
3) the unit must have a pre-control potential to emit of greater than the major source thresholds.

Pollutant	Major Source Threshold (lb/year)
VOC	20,000
NO_X	20,000
CO	200,000
PM_{10}	140,000
SO_X	140,000

The permit for these engines contains emission limits for NO_X, CO, VOC, PM_{10} and SO_X emissions. However, these engines are not equipped with any add on control devices for PM_{10}. Therefore, the CAM requirements of 40 CFR 64 are not applicable for this pollutant.

NO_X Emissions:

The engines are equipped with a non-selective catalytic reduction (NSCR) system and selective catalytic reduction (SCR) system with ammonia injection. This system provides control for NO_X emissions. The manufacturer has stated the NSCR/SCR system will achieve a 85% control efficiency for the NO_X emissions generated in the digester gas-fired engine. Therefore, the uncontrolled NO_X emission rate from these engines can be determined using the controlled emission factor, maximum horsepower rating of the engines, and the control efficiency of the NSCR/SCR system.

Controlled Emission Factor = 0.15 g/bhp-hr
Horsepower Rating = 1,393 bhp
Maximum Operating Schedule = 8,400 hours/year
NSCR/SCR System Control Efficiency = 85%

$$\text{Annual Uncontrolled PE} = \frac{[0.15\ \text{g/bhp-hr} \times 1{,}393\ \text{bhp} \times 8{,}400\ \text{hours/year} \div 453.6\ \text{g/lb}]}{(1 - 0.85)]}$$

Annual Uncontrolled PE = 25,796 lb/year

As shown above, the uncontrolled PE for NO_X emissions is greater than the major source threshold. Therefore, the engines are subject to the requirements of 40 CFR 64.

§64.3 - Monitoring Design Criteria

This section specifies the design criteria for the CAM system. Paragraph (a) (General criteria) requires that the CAM system be designed to obtain data for one or more appropriate indicators of emission control system performance and requires the owner to establish appropriate ranges or designated conditions for the selected indicators such that operation within the ranges provides a reasonable assurance of ongoing compliance with emission limitations or standards for the anticipated range of operating conditions.

As shown above, the digester gas-fired engines are served by a non-selective catalytic reduction (NSCR) system/selective catalytic reduction (SCR) system. A Selective Catalytic Reduction (SCR) system operates as an external control device where flue gases and a reagent, in this case ammonia, are passed through an appropriate catalyst. Ammonia, will be injected upstream of the catalyst where it reacts and reduces NO_X, over the catalyst bed, to form elemental nitrogen and other by-products.

The facility has chosen to satisfy CAM requirements by performing daily monitoring utilizing a portable analyzer at each engine exhaust stack. The portable analyzer will take NO_X and O_2 measurements at least once each day that the engine operates. The post-project potential to emit for NOx for each engine is 4,035 lb per year which is below the major source threshold. Therefore, portable analyzer monitoring of NOx once per day is sufficient.

The following condition will be listed on the permit to ensure compliance with this section:

- The permittee shall monitor and record the stack concentration of NOx and O2 at least once every day (in which a source test is not performed). NOx and O2 concentrations shall be performed using a portable emission monitor that meets District specifications. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702 and 40 CFR 64]

Paragraph (b) (*Performance criteria)* requires the owner or operator to establish and maintain the following:

- Specifications to ensure that representative data are collected

The applicant has proposed to perform daily monitoring utilizing a portable analyzer and to perform daily recordkeeping. Therefore, sufficient data will be collected for the engines to ensure it is operating in compliance to justify the once daily readings as representative normal operating conditions.

- Verification procedures for startup of new monitoring equipment
- Quality assurance and control practices to ensure continuing validity of data

Periodic NO_X source testing is required at least once every 8,760 hours of operation or 24 months, whichever comes first and monitoring of the NH_3 slip with Draeger tubes is performed at least once per month. These periodic direct emission measurements ensure that the engines and the SCR system are operating properly. In addition, the engine is serviced and/or tuned in accordance with the manufacturer's recommendations.

- Data collection frequency and procedures

The facility will be required to measure and record the NOx and O_2 readings from these engines at least once daily. These records shall be maintained by the facility and shall be made available upon request.

Paragraph (c) (Evaluation factors) requires the owner or operator to take into account site specific factors in the design of the CAM system.

> (c) Evaluation factors. In designing monitoring to meet the requirements of this section, the owner or operator shall take into account site-specific factors including the applicability of existing monitoring equipment and procedures, the ability of the monitoring to account for process and control device operational variability, the reliability and latitude built into the control technology, and the level of actual emissions relative to the compliance limitation.

No additional site specific information will need to be accounted for in the design of the proposed CAM system.

> (d) Special criteria for the use of continuous emission monitoring system (CEMS), continuous opacity monitoring system (COMS) or predictive emission monitoring system (PEMS)

A CEMS, COMS, or PEMS is not necessary or required for the subject emission unit. Therefore, the requirements of this section are not applicable.

§64.4 - Submittal Requirements

This section specifies submittal requirements for the owner or operator which ensure the CAM system will comply with the design criteria of §64.3. The facility has submitted a complete CAM system proposal that specifies the parameters to be monitored in accordance with §64.3 above. Therefore, the facility has satisfied the requirements of the submittal requirements of this section.

§64.5 - Deadlines for Submittals

This section specifies required timing for submittals required under §64.4.

Large pollutant-specific emissions units (those with controlled emissions exceeding major source thresholds) are required to make the submittals as a part of the initial Title V permit application where the application has either not been filed or has not been deemed complete. Where the initial Title V permit has been issued without implementation of 40 CFR 64, the owner or operator must make the required submittals as a part of a subsequent application for any significant permit revision. If the required information is not submitted by either of these deadlines, it must be submitted as a part of the application for the Title V permit renewal.

For *other pollutant-specific emissions units,* the required submittal deadline is the application for Title V permit renewal. The facility has submitted their CAM proposal with this significant permit revision. Therefore, the facility has satisfied the submittal deadline requirements of this section.

§64.6 - Approval of Monitoring

This section stipulates the following:

- A requirement that the permitting authority act to approve the proposed monitoring by confirming that the monitoring submitted complies with the requirements of §64.3.
- An allowance for the permitting authority to condition the approval based on collecting additional data on the indicators to be monitored, including performance or compliance testing.
- The minimum conditions that must be placed on the permit in the event that the proposed monitoring is approved by the permitting authority including a milestone schedule for completion of any conditional approval actions required by the owner or operator, such as installations, testing, or verification of operational status.
- Actions required by the permitting authority in the event that the proposed monitoring is not approved.

The CAM submittal requirements and stipulations for approval of such submittals pursuant to §64.4, §64.5, and §64.6 have been completed in conjunction with the application and review process for this application. Therefore, the facility is in compliance with the requirements of this section.

§64.7 - Operation of Approved Monitoring

This section stipulates the following:

- Requirements that the owner or operator 1) commence the monitoring upon receipt of a Title V permit that includes such monitoring, 2) properly maintain the monitoring system, and 3) conduct all monitoring in a continuous mode with the exception of outage periods associated with monitor malfunction and repair and with quality assurance and control activities.
- Actions required by the owner or operator in response to excursions or exceedances.
- A requirement for the owner or operator to document any need for improved monitoring based upon either an identification of a failure of the monitoring system to identify an excursion or exceedance or upon the results of compliance or performance testing that identifies a need to modify the monitoring.

The following condition will be included on the permit to ensure compliance with this section:

- The permittee shall comply with the compliance assurance monitoring operation and maintenance requirements of 40 CFR Part 64.7. [40 CFR 64]

§64.8 - Quality Improvement Plan (QIP) Requirements

This section stipulates that the Administrator or the permitting authority may require that the facility develop and implement a QIP in the event of a determination of a need for improved monitoring pursuant to §64.7. §64.8 also identifies the minimum elements required in the QIP, and requires that the facility implement the QIP as expeditiously as possible, with implementation not exceeding 180 days after the date that the need for implementation was identified unless the permitting authority is notified.

The following condition will be included on the permit to ensure compliance with this section:

- If the District or EPA determine that a Quality Improvement Plan is required under 40 CFR 64.7(d)(2), the permittee shall develop and implement the Quality Improvement Plan in accordance with 40 CFR part 64.8. [40 CFR 64]

§64.9 - Reporting and Recordkeeping Requirements

This section stipulates the minimum reporting and recordkeeping requirements for facilities subject to 40 CFR 64.

The following condition will be included on the permit to ensure compliance with this section:

- The permittee shall comply with the record keeping and reporting requirements of 40 CFR part 64.9. [40 CFR Part 64.9]

§64.10 - Savings Provisions

This section states that the purpose of 40 CFR 64 is to require, as a part of the issuance of a Title V permit, improved or new monitoring at those emissions units where monitoring requirements do not exist or are inadequate to meet the requirements of 40 CFR 64. In addition, §64.10 states that nothing in 40 CFR 64 shall excuse an owner or operator from any other requirements of federal, state or local law or restrict or abrogate the authority of the Administrator or of the permitting authority.

SO_X Emissions:

The engines are equipped with a sulfur scrubber consisting of a wet scrubber followed by an activated carbon adsorption filter. This system provides control for SO_X emissions. Typically, the District assumes a minimum 95% control efficiency for sulfur scrubber systems. Therefore, the uncontrolled SO_X emission rate from these engines can be determined using the controlled emission factor, maximum horsepower rating of the engines, and the control efficiency of the sulfur scrubber system.

Controlled Emission Factor = 0.025 g/bhp-hr
Horsepower Rating = 1,393 bhp
Maximum Operating Schedule = 8,400 hours/year
Sulfur Scrubber System Control Efficiency = 95%

$$\text{Annual Uncontrolled PE} = \frac{[0.025\ \text{g/bhp-hr} \times 1{,}393\ \text{bhp} \times 8{,}400\ \text{hours/year} \div 453.6\ \text{g/lb}]}{(1 - 0.95)]}$$

Annual Uncontrolled PE = 12,898 lb/year

As shown above, the uncontrolled PE for SO_X emissions is not greater than the major source threshold. Therefore, the engines are not subject to the requirements of 40 CFR 64.

CO Emissions:

The engines are equipped with a non-selective catalytic reduction system and selective catalytic reduction (SCR) system with ammonia injection. This system provides control for CO emissions. The manufacturer has stated the NSCR/SCR system will achieve a 42.9% control efficiency for the CO emissions generated in the digester gas-fired engine. Therefore, the uncontrolled CO emission rate from these engines can be determined using the controlled emission factor, maximum horsepower rating of the engines, and the control efficiency of the NSCR/SCR system.

Controlled Emission Factor = 0.8 g/bhp-hr
Horsepower Rating = 1,393 bhp
Maximum Operating Schedule = 8,400 hours/year
NSCR/SCR System Control Efficiency = 42.9%

$$\text{Annual Uncontrolled PE} = \frac{[0.8\ \text{g/bhp-hr} \times 1{,}393\ \text{bhp} \times 8{,}400\ \text{hours/year} \div 453.6\ \text{g/lb}]}{(1 - 0.429)]}$$

Annual Uncontrolled PE = 36,142 lb/year

As shown above, the uncontrolled PE for CO emissions is not greater than the major source threshold. Therefore, the engines are not subject to the requirements of 40 CFR 64.

VOC Emissions:

The engines are equipped with a non-selective catalytic reduction system and selective catalytic reduction (SCR) system with ammonia injection. This system provides control for VOC emissions. The manufacturer has stated the NSCR/SCR system will achieve a 74.3% control efficiency for the VOC emissions generated in the digester gas-fired engine. Therefore, the uncontrolled VOC emission rate from these engines can be determined using the controlled emission factor, maximum horsepower rating of the engines, and the control efficiency of the NSCR/SCR system.

Controlled Emission Factor = 0.10 g/bhp-hr
Horsepower Rating = 1,393 bhp
Maximum Operating Schedule = 8,400 hours/year
NSCR/SCR System Control Efficiency = 74.3%

$$\text{Annual Uncontrolled PE} = \frac{[0.10\ \text{g/bhp-hr} \times 1{,}393\ \text{bhp} \times 8{,}400\ \text{hours/year} \div 453.6\ \text{g/lb}]}{(1 - 0.743)]}$$

Annual Uncontrolled PE = 10,037 lb/year

As shown above, the uncontrolled PE for VOC emissions is not greater than the major source threshold. Therefore, the engines are not subject to the requirements of 40 CFR 64.

Rule 4001 New Source Performance Standards (NSPS)

40 CFR 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60. 40 CFR Part 60, Subpart JJJJ applies to spark-ignited internal combustion engines.

Section 60.4230(a) states the provisions of this subpart are applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (5) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

Section 60.4230(a)(4) states owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured: (i) on or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP); (ii) on or after January 1, 2008, for lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP; (iii) on or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or (iv) on or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 KW (25 HP) are applicable to the provisions of this subpart.

The engines in this project commenced construction and were manufactured in 2012 and are non-emergency lean burn engines with a maximum engine power of 1,393 HP each. Therefore, this section is applicable and the engines in this project are subject to this subpart.

Sections 60.4231 and 60.4232 apply only to the manufacturers of stationary SI internal combustion engines. These sections do not apply to owners or operators of such engines. Therefore, these sections do not apply.

Section 60.4233 lists emission standards for owners and operators. Per Section 60.4233(e), owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011 that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the CO certification (not field testing) standard for which the engine was certified.

Table 1 of this subpart for digester gas-fired engines HP ≥ 500 and manufacture date 7/1/2010 or later lists the NOx standard as 2.0 g/bhp-hr (equivalent to 150 ppmv @ 15% O_2), the CO standard as 5.0 g/bhp-hr (equivalent to 610 ppmv @ 15% O_2), and the VOC standard as 1.0 g/bhp-hr (equivalent to 80 ppmv @ 15% O_2). Emissions from the proposed engines meet the required emissions standards. The following condition will be placed on the permit to ensure compliance:

- Emissions from the IC engine when fired on digester gas shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr, 0.025 g-SOx/bhp-hr (based on 40 ppmv sulfur content in fuel (as H_2S), 0.033 g-PM_{10}/bhp-hr, 0.8 g-CO/bhp-hr, or 0.10 g-VOC/bhp-hr. [District Rules 2201 and 4702, and 40 CFR 60 Subpart JJJJ]

Section 60.4234 states owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in Section 60.4233 over the entire life of the engine.

District Rule 4702 requires periodic monitoring to ensure that the applicable emission limits contained in the permit are met. Additionally, the emissions rates for the engines will be listed as a permit condition for the life of the permit. Therefore, the requirements of this section are satisfied.

Section 60.4235 applies only to SI ICE that use gasoline. The proposed engines do not use gasoline. Therefore, this section does not apply.

Section 60.4236(b) states that after July 1, 2009, owners and operators may not install stationary SI ICE with a maximum engine power of greater than or equal to 500 HP that do not meet the applicable requirements in §60.4233, except that lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP that do not meet the applicable requirements in §60.4233 may not be installed after January 1, 2010.

As previously discussed, the proposed engines meet the applicable requirements of Section 60.4233. Therefore, the requirements of Section 60.4236 are satisfied.

Section 60.4237 lists monitoring requirements for emergency stationary SI ICE. The proposed engines are not used for emergency operation. Therefore, this section does not apply.

Sections 60.4238 through 60.4242 apply only to manufacturers of stationary SI ICE. Therefore, these sections do not apply.

Section 60.4243 lists compliance requirements for owners and operators of stationary SI ICE. Section 60.4243(b)(2)(ii) states that owners or operators of a stationary SI internal combustion engine greater than 500 HP must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, the owner or operator must conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance.

As Rule 4702 requires source testing once every 24 months, the 24 month source testing requirement will be required since it is more stringent than the 3 year source testing requirement of this subpart. Source testing will be required within 60 days of initial start-up. The following conditions will be placed on the permit to ensure compliance:

- The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type and quantity of fuel used, maintenance or modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]
- Source testing to measure digester gas-combustion NOx, CO, VOC and ammonia emissions from this unit shall be conducted within 60 days of initial start-up and once every 8,760 hours of operation or 24 months, whichever comes first, thereafter. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]
- This engine shall be operated and maintained in proper operating condition according to the manufacturer's specifications. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]

Section 60.4243(g) states that it is expected that air-to-fuel ratio controllers will be used with the operation of three-way catalysts/non-selective catalytic reduction. The ARF controller must be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times.

The following condition will be added to the permits to ensure compliance:

- Air-to-fuel ratio controller(s) shall be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [District Rule 2201 and 40 CFR 60 Subpart JJJJ]

Section 60.4244 lists test methods and other procedures for owners and operators of stationary SI ICE who conduct performance tests. Three separate test runs are required for each performance test, and each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load. Additionally, performance tests may not be conducted during periods of startup, shutdown, or malfunction.

The following condition will be added to the permits to ensure compliance:

- For initial emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. NOx, CO and VOC concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]
- Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]

Section 60.4245(a) states that owners and operators of all stationary SI ICE must keep records of the following information:

- All notifications submitted to comply with this subpart and all documentation supporting any notification.
- Maintenance conducted on the engine.
- If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90, 1048, 1054, and 1060, as applicable.
- If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to §60.4243(a)(2), documentation that the engine meets the emission standards.

The following condition will be placed on the permit to ensure compliance:

- The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type and quantity of fuel used, maintenance or modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]

Section 60.4245(c) states owners and operators of stationary SI ICE greater than or equal to 500 HP that have not been certified by an engine manufacturer to meet the emission standards in §60.4231 must submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (c)(1) through (5) of this section.

(1) Name and address of the owner or operator;
(2) The address of the affected source;
(3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
(4) Emission control equipment; and
(5) Fuel used.

The following condition will be placed on the permit to ensure compliance:

- Notification of the date construction of this engine commenced shall be submitted to the District and EPA and shall be postmarked no later than 30 days after such date as construction commenced. The notification shall contain the following information: 1) Name and address of the owner or operator; 2) The address of the affected source; 3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement; 4) Emission control equipment; and 5) Fuel used. [40 CFR 60, Subpart JJJJ]

Section 60.4245(d) states owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test within 60 days after the test has been completed.

The following condition will be placed on the permit to ensure compliance:

- The results of each source test shall be submitted to the District and EPA within 60 days after completion of the source test. [District Rule 1081 and 40 CFR 60 Subpart JJJJ]

Therefore, compliance with the requirements of this rule is expected.

Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

40 CFR Part 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

Section 63.6585 states you are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.
(b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.
(c) An area source of HAP emissions is a source that is not a major source.
(d) If you are an owner or operator of an area source subject to this subpart, your status as an entity subject to a standard or other requirements under this subpart does not subject you to the obligation to obtain a permit under 40 CFR part 70 or 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart as applicable.
(e) If you are an owner or operator of a stationary RICE used for national security purposes, you may be eligible to request an exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C.

The proposed engines are stationary and the facility is an area source of HAP emissions. Therefore, the provisions of this subpart are applicable.

Section 63.6590 states this subpart applies to each affected source.

(a) Affected source. An affected source is any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions, excluding stationary RICE being tested at a stationary RICE test cell/stand.

The proposed engines in this project are new and located at an area source of HAP emissions.

(1) Existing stationary RICE.
(i) For stationary RICE with a site rating of more than 500 brake horsepower (HP) located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before December 19, 2002.
(ii) For stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.
(iii) For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.
(iv) A change in ownership of an existing stationary RICE does not make that stationary RICE a new or reconstructed stationary RICE.

The proposed engines in this project are not existing stationary RICE.

(2) New stationary RICE.
(i) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.
(ii) A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.
(iii) A stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

The proposed engines in this project are located at an area source of HAP emissions and commenced construction after June 12, 2006; therefore, the proposed engines in this project are new stationary RICE.

(3) Reconstructed stationary RICE.
(i) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after December 19, 2002.

(ii) A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.
(iii) A stationary RICE located at an area source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.

The proposed engines in this project are not reconstructed stationary RICE.

(b) Stationary RICE subject to limited requirements.

The proposed engines in this project are not stationary RICE subject to limited requirements.

(c) Stationary RICE subject to Regulations under 40 CFR Part 60. An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.
(1) A new or reconstructed stationary RICE located at an area source;
(2) A new or reconstructed 2SLB stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;
(3) A new or reconstructed 4SLB stationary RICE with a site rating of less than 250 brake HP located at a major source of HAP emissions;
(4) A new or reconstructed spark ignition 4 stroke rich burn (4SRB) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;
(5) A new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis;
(6) A new or reconstructed emergency or limited use stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;
(7) A new or reconstructed compression ignition (CI) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions.

The proposed engines in this project are new stationary RICE located at an area source subject to 40 CFR part 60 subpart JJJJ. Therefore, no further requirements apply for such engines under this part.

Therefore, compliance with the requirements of this rule is expected.

Rule 4101 Visible Emissions

Rule 4101 states that no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity.

The following condition will be added to the permit to ensure compliance:

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

Rule 4102 Nuisance

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 and the following condition will be added to the permit to ensure compliance:

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

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – Risk Management Policy for Permitting New and Modified Sources 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 (Attachment B), 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.

The following condition will be listed on the permit to ensure compliance:

- The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. [District Rule 4102]

Rule 4201 Particulate Matter Concentration

Section 3.0 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.

$$0.033 \quad \frac{g-PM_{10}}{bhp-hr} \times \frac{1\,bhp-hr}{2{,}542.5\,Btu} \times \frac{10^6\,Btu}{9{,}800\,dscf} \times \frac{0.35\,Btu_{out}}{1\,Btu_{in}} \times \frac{15.43\,grain}{g} = \quad 0.007 \quad \frac{grain-PM}{dscf}$$

Since the particulate matter concentration is ≤ 0.1 grains per dscf, compliance with Rule 4201 is expected.

Therefore, the following condition will be listed on the permits to ensure compliance:

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

Rule 4301 Fuel Burning Equipment

This rule specifies maximum emission rates in lb/hr for SO_2, NO_2, and combustion contarninants (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. As shown below, each unit's maximum hourly emission rates are below the Rule 4301 limits.

District Rule 4301 Limits			
Unit	NO_2	Total PM	SO_2
N-1237-605-0	0.46	0.10	0.075
N-1237-606-0	0.46	0.10	0.075
Rule 4301 Limit	**140 lb/hr**	**10 lb/hr**	**200 lb/hr**

As shown above, compliance with the requirements of this rule is expected.

Rule 4701 Stationary Internal Combustion Engines – Phase I

The requirements of Rule 4702 are equivalent or more stringent than the requirements of this Rule. Since the proposed IC engine is subject to both Rules 4701 and 4702, compliance with Rule 4702 is sufficient to demonstrate compliance with this Rule.

Rule 4702 Internal Combustion Engines – Phase 2

The purpose of this rule is to limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion engines.

Section 2.0 states that this rule applies to any internal combustion engine rated at 25 brake horsepower or greater. Each of the proposed engines for cogeneration system is rated at 2,165 bhp. Therefore, this rule is applicable to each engine.

Section 5.2, Table 2, Category 2.d. for spark-ignited internal combustion engine rated at >50 bhp used exclusively in non-agricultural operations engine type lean-burn engines four-stroke requires the owner or operator to comply with the following emission limits:

Table 2 Emission Limits for a Spark-Ignited Internal Combustion Engine Rated at >50 bhp Used Exclusively in Non-AO (All ppmv limits are corrected to 15% oxygen on a dry basis). Emission Limits are effective according to the compliance schedule specified in Section 7.5.

Engine Type	NOx Limit (ppmv)	CO Limit (ppmv)	VOC Limit (ppmv)
2. Lean-Burn Engines			
d. Lean-Burn Engine, not listed above	11	2000	750

The facility has proposed to achieve the following emissions:

NO_x: 11 ppmvd @ 15 % O_2;
CO: 96.2 ppmvd @ 15 % O_2; and
VOC: 21 ppmvd @ 15 % O_2

The proposed emissions are less than the Table 2 limits. Therefore, compliance with this section is expected.

Section 5.3 requires that all continuous emission monitoring systems (CEMS) emissions measurements shall be averaged over a period of 15 consecutive minutes. Any 15-consecutive minute block average CEMS measurement exceeding the applicable emission limits of this rule shall constitute a violation of this rule. The IC engines involved with this project do not have a CEMS installed; therefore this section of the rule is not applicable.

Sections 5.4 and 5.5 outlines calculation methodologies and requirements for percent emission reductions, if used to comply with the NOx emission limits. The IC engines involved with this project do not propose to use percent emission reductions to comply with the NOx emission limits; therefore this section of the rule is not applicable.

Section 5.6 outlines the requirements for payment of an annual fee in lieu of complying with a NOx emission limit. The IC engines involved with this project do not propose to pay an annual fee in lieu of complying with the NOx emission limits; therefore this section of the rule is not applicable.

Section 5.7 outlines sulfur oxides (SOx) emission control requirements. On and after the compliance schedule specified in Section 7.5, operators of non-AO spark-ignited engines and non-AO compression-ignited engines shall comply with one of the following requirements:

5.7.1 Operate the engine exclusively on PUC-quality natural gas, commercial propane, butane, or liquefied petroleum gas, or a combination of such gases; or
5.7.2 Limit gaseous fuel sulfur content to no more than five (5) grains of total sulfur per one hundred (100) standard cubic feet; or
5.7.3 Use California Reformulated Gasoline for gasoline-fired spark-ignited engines; or
5.7.4 Use California Reformulated Diesel for compression-ignited engines; or
5.7.5 Operate the engine on liquid fuel that contains no more than 15 ppm sulfur, as determined by the test method specified in Section 6.4.6; or
5.7.6 Install and properly operate an emission control system that reduces SO_2 emissions by at least 95% by weight as determined by the test method specified in Section 6.4.6.

The facility is proposing to use digester gas fuel with a sulfur content no more than five (5) grains of total sulfur per one hundred (100) standard cubic feet. Therefore, compliance with this section is expected.

$$\left(\frac{40\ ft^3 - H_2S}{10^6\ ft^3 - fuel}\right)\left(\frac{lb - mol\ H_2S}{379.5\ scf\ H_2S}\right)\left(\frac{lb - mol\ S}{lb - mol\ H_2S}\right)\left(\frac{32\ lb\ S}{lb - mol\ S}\right)\left(\frac{7000\ gr}{lb}\right)(100) = 2.36\frac{gr - S}{100\ \ scf}$$

Section 5.8.1 outlines monitoring requirements for non-AO spark-ignited engines subject to the requirements of Section 5.2 or any engine subject to the requirements of Section 8.0. The IC engines involved with this project are non-AO spark-ignited engines subject to the requirements of Section 5.2.

Section 5.8.1 requires that for each engine with a rated brake horsepower of 1,000 bhp or greater and which is allowed by Permit-to-Operate or Permit-Exempt Equipment Registration condition to operate more than 2,000 hours per calendar year, or with an external emission control device, either install, operate, and maintain continuous monitoring equipment for NOx, CO, and oxygen, as identified in Rule 1080 (Stack Monitoring), or install, operate, and maintain APCO approved alternate monitoring. The monitoring system may be a continuous emissions monitoring system (CEMS), a parametric emissions monitoring system (PEMS), or an alternative monitoring system approved by the APCO. APCO-approved alternate monitoring shall consist of one or more of the following:

5.8.1.1 Periodic NOx and CO emission concentrations,
5.8.1.2 Engine exhaust oxygen concentration,
5.8.1.3 Air-to-fuel ratio,
5.8.1.4 Flow rate of reducing agents added to engine exhaust,
5.8.1.5 Catalyst inlet and exhaust temperature,
5.8.1.6 Catalyst inlet and exhaust oxygen concentration, or
5.8.1.7 Other operational characteristics.

The applicant has chosen to meet the requirements of Section 5.8.1 of the rule by proposing a pre-approved alternate emissions monitoring plan that specifies that the permittee perform periodic NO_x, CO, and O_2 emissions concentrations as specified in District Policy SSP-1810, dated 4/29/04. Therefore, the following conditions will be listed on proposed ATC to ensure compliance:

- The permittee shall monitor and record the stack concentration of NOx and O2 at least once every day (in which a source test is not performed). NOx and O2 concentrations shall be performed using a portable emission monitor that meets District specifications. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702 and 40 CFR 64]
- The permittee shall monitor and record the stack concentration of CO and NH3 at least once every month (in which a source test is not performed). CO concentrations shall be performed using a portable emission monitor that meets District specifications. NH3 monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
- If the NOx or CO concentrations corrected to 15% O_2, as measured by the portable analyzer, or the NH3 concentrations corrected to 15% O_2, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours 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 2201 and 4702]
- {2994} 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 Rule 4702]

Section 5.8.6 requires that for each engine, install and operate a nonresettable elapsed operating time meter. In lieu of installing a nonresettable time meter, the owner or operator may use an alternative device, method, or technique in determining operating time provided that the alternative is approved by the APCO and is allowed by a Permit-to-Operate condition. The owner of the engine shall properly maintain and operate the time meter or alternative device in accordance with the manufacturer's instructions.

The applicant has proposed this engine will be equipped with a nonresettable elapsed operating time meter. The following condition will be listed on the permit to ensure compliance:

- This engine shall be equipped with a nonresettable elapsed operating time meter or other APCO approved alternative. [District Rules 2201 and 4702 and 40 CFR 60 Subpart JJJJ]

Section 5.8.7 requires that for each engine, the permittee implement the Inspection and Monitoring (I&M) plan, if any, submitted to and approved by the APCO pursuant to Section 6.5. The following condition will be listed on the permit to ensure compliance:

- {3202} This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. [District Rule 4702]

Section 5.8.8 requires that for each engine, collect data through the I&M plan in a form approved by the APCO. The ATC application will be considered compliance with the initial I&M plan and the implementation of this plan will be explained below in the discussion of Section 6.5 of this rule.

Section 5.8.9 requires that for each engine, the operator shall use a portable NO_x analyzer to take NO_x emission readings to verify compliance with the emission requirements of Section 5.2 or Section 8.0 during each calendar quarter in which a source test is not performed. All emission readings shall be taken with the engine 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. All NO_x emissions readings shall be reported to the APCO in a manner approved by the APCO. NO_x emission readings taken pursuant to this section 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.

The alternate monitoring scheme proposed in Section 5.8.1 will satisfy the requirements of Section 5.8.9. The following conditions will be listed on the permit to ensure compliance:

- The permittee shall monitor and record the stack concentration of NOx and O2 at least once every day (in which a source test is not performed). NOx and O2 concentrations shall be performed using a portable emission monitor that meets District specifications. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702 and 40 CFR 64]
- The permittee shall monitor and record the stack concentration of CO and NH3 at least once every month (in which a source test is not performed). CO concentrations shall be performed using a portable emission monitor that meets District specifications. NH3 monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
- {2994} 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 Rule 4702]

Section 5.9 of the rule presents the alternative monitoring requirements for various engines not subject to the normal monitoring requirements of Section 5.8. These engines are required to monitor emissions under Section 5.8, so Section 5.9 does not apply.

Section 5.10 requires that on and after the compliance schedule specified in Section 7.5, an operator of a non-AO engine shall comply with the following requirements:

5.10.1 An operator of an engine complying with Sections 5.7.2 or 5.7.5 shall perform an annual sulfur fuel analysis in accordance with the test methods in Section 6.4. The operator shall keep the records of the fuel analysis and shall provide it to the District upon request,

5.10.2 An operator of an engine complying with Section 5.7.6 by installing and operating a control device with at least 95% by weight SOx reduction efficiency shall submit for approval by the APCO the proposed the key system operating parameters and frequency of the monitoring and recording not later than July 1, 2013, and

5.10.3 An operator of an engine complying with Section 5.7.6 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 6.4.

This unit is fired on digester gas. Therefore, the following requirement will be included on the permit to comply with the SOx emissions monitoring requirement:

- The sulfur content of the digester gas combusted in this engine shall be monitored and recorded monthly. After eight (8) consecutive monthly tests show compliance, the digester gas sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the digester gas sulfur content limit of this permit, then monthly monitoring shall resume and continue until eight consecutive months of monitoring show compliance with the gas sulfur content limit. Once compliance with the gas sulfur content limit is shown for eight consecutive months, then the monitoring frequency may return to quarterly. Records of the results of monitoring of the digester gas sulfur content shall be maintained. [District Rule 2201]
- Monitoring of the digester gas sulfur content shall be performed using a Testo 350 XL portable emission monitor; District-approved in-line H_2S monitors; gas detection tubes calibrated for H_2S; District-approved source test methods, including EPA Method 11 or EPA Method 15, ASTM Method D1072, D4084, and D5504; or an alternative method approved by the District. Prior to utilization of in-line monitors to demonstrate compliance with the digester gas sulfur content limit of this permit, the permittee shall submit details of the proposed monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201]

Section 6.1 requires that the operator of an engine subject to the requirements of Section 5.2 of this rule shall submit to the APCO an APCO-approvable emission control plan of all actions to be taken to satisfy the emission requirements of Section 5.2 and the compliance schedules of Section 7.0. If there is no change to the previously-approved emission control plan, the operator shall submit a letter to the District indicating that the previously approved plan is still valid.

Section 6.1.2 requires that the emission control plan shall identify the type of emission control device or technique to be applied to each engine and a construction/removal schedule, or shall provide support documentation sufficient to demonstrate that the engine is in compliance with the emission requirements of this rule.

This submitted ATC application satisfies the requirements of this section.

Section 6.2.1 requires that the owner of an engine subject to the requirements of this rule shall maintain an engine operating log to demonstrate compliance with this rule. This information shall be retained for a period of at least five years, shall be readily available, and be made available to the APCO upon request. The engine operating log shall include, on a monthly basis, the following information:

- Total hours of operation,
- Type of fuel used,
- Maintenance or modifications performed,
- Monitoring data,
- Compliance source test results, and
- Any other information necessary to demonstrate compliance with this rule.

Therefore, the following condition will be included on the permit to ensure compliance:

- The permittee shall maintain records of: (1) the date and time of NOx, CO, O_2, and NH3 measurements, (2) the O_2 concentration in percent and the measured NOx, CO, and NH_3 concentrations corrected to 15% O_2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH_3 emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
- The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type and quantity of fuel used, maintenance or modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]

Section 6.2.2 requires that the data collected pursuant to the requirements of Section 5.8 and Section 5.9 shall be maintained for at least five years, shall be readily available, and made available to the APCO upon request. Therefore, the following condition will be included on the permit to ensure compliance:

- 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 Rule 4702]

Section 6.3.1 states the requirements of Section 6.3.2 through Section 6.3.4 shall apply to the following engines:

6.3.1.1 Engines that have been retrofitted with an exhaust control device, except those certified per Section 9.0;
6.3.1.2 Engines subject to Section 8.0;
6.3.1.3 An AO spark-ignited engine that is subject to the requirements of Section 8.0;
6.3.1.4 An AO spark-ignited engine that has been retrofitted with a catalytic emission control and is not subject to the requirements of Section 8.0.

The engines in this project have been retrofitted with an exhaust control device. Therefore, Sections 6.3.2 through Section 6.3.4 are applicable to the engines in this project.

Section 6.3.2 requires that the operator of an engine subject to the requirements of Section 5.2, which engine equipped with an exhaust control device, to demonstrate compliance with the applicable emission limits during the initial start-up and at least once every 24 months thereafter.

Section 6.3.3 requires that the test must be conducted with the unit operating at normal operating conditions and using three 30-consecutive minute test runs. In addition, VOC shall be reported as methane, VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15 percent oxygen.

Section 6.3.4 requires in addition to other information, the source test protocol shall describe which critical parameters will be measured and how the appropriate range for these parameters shall be established. The range for these parameters shall be incorporated into the I&M plan.

Section 6.3.5 specifies that engine that is limited by PTO condition to be fueled exclusively with PUC-quality natural gas shall not be subject to reoccurring source test requirements of Section 6.3.2 for VOC emissions.

The proposed engines are fired on digester gas. Therefore, Section 6.3.5 is not applicable.

Source testing will be required within 60 days of initial start-up. The following conditions will be included on the permit to ensure compliance:

- Source testing to measure digester gas fuel combustion NOx, CO, VOC and ammonia emissions from this unit shall be conducted within 60 days of initial start-up and once every 8,760 hours of operation or 24 months, whichever comes first, thereafter. [District Rules 2201 and 4702 and 40 CFR 60 Subpart JJJJ]
- Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702]
- For initial emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. NOx, CO and VOC concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]

Section 6.4 requires that the compliance with the requirements of Section 5.2 shall be determined in accordance with the following test procedures or any other method approved by EPA and the APCO:

- Oxides of nitrogen - EPA Method 7E, or ARB Method 100.
- Carbon monoxide - EPA Method 10, or ARB Method 100.
- Stack gas oxygen - EPA Method 3 or 3A, or ARB Method 100.
- Volatile organic compounds - EPA Method 25A or 25B, or ARB Method 100.
- Operating horsepower determination - any method approved by EPA and the APCO.

Therefore, the following condition will be included on the permit to ensure compliance:

- The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, and VOC (ppmv) - EPA Method 25A or 25B, or ARB Method 100. [District Rules 1081 and 4702]
- Source testing for ammonia slip shall be conducted utilizing BAAQMD method ST-1B. [District Rule 1081]

Section 6.5 requires that the owner of an engine subject to the emission limits in Section 5.2 or the requirements of Section 8.0, shall submit to the APCO for approval, an I&M plan that specifies all actions to be taken to satisfy the following requirements and the requirements of Section 5.8. The actions to be identified in the I&M plan shall include, but are not limited to, the information specified below.

Section 6.5.1 states the requirements of Section 6.5.2 through Section 6.5.9 shall apply to the following engines:

6.5.1.1 Engines that have been retrofitted with an exhaust control device, except those certified per Section 9.0;
6.5.1.2 Engines subject to Section 8.0;
6.5.1.3 An AO spark-ignited engine that is subject to the requirements of Section 8.0.
6.5.1.4 An AO spark-ignited engine that has been retrofitted with a catalytic emission control and is not subject to the requirements of Section 8.0.

The engines in this project have been retrofitted with an exhaust control device. Therefore, Sections 6.5.2 through Section 6.5.9 are applicable to the engines in this project.

Section 6.5.2 specifies procedures requiring the owner or operator to establish ranges for control equipment parameters, engine operating parameters, and engine exhaust oxygen concentrations that source testing has shown result in pollutant concentrations within the rule limits.

Section 6.5.3 specifies procedures for monthly inspections as approved by the APCO. The applicable control equipment parameters and engine operating parameters will be inspected and monitored monthly in conformance with a regular inspection schedule listed in the I&M plan. The applicant has previously proposed that the alternate monitoring program will ensure compliance with Sections 6.5.2 and 6.5.3 of the Rule. Therefore, the following condition will ensure compliance with the I&M requirements of this rule:

- The permittee shall monitor and record the stack concentration of NOx and O2 at least once every day (in which a source test is not performed). NOx and O2 concentrations shall be performed using a portable emission monitor that meets District specifications. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702 and 40 CFR 64]
- The permittee shall monitor and record the stack concentration of CO and NH3 at least once every month (in which a source test is not performed). CO concentrations shall be performed using a portable emission monitor that meets District specifications. NH3 monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

Section 6.5.4 specifies procedures for the corrective actions on the noncompliant parameter(s) that the operator will take when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NOx, CO, VOC, or oxygen concentrations.

Section 6.5.5 specifies procedures for the operator to notify the APCO when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NOx, CO, VOC, or oxygen concentrations.

The applicant has proposed that the alternate monitoring program will ensure compliance with these two sections of the Rule. The following condition will ensure compliance with these requirements:

- If the NOx or CO concentrations corrected to 15% O_2, as measured by the portable analyzer, or the NH_3 concentrations corrected to 15% O_2, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours 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 2201 and 4702]

Section 6.5.6 specifies procedures for preventive and corrective maintenance performed for the purpose of maintaining an engine in proper operating condition. The applicant has proposed that the engines will be operated and maintained per the manufacturer's specifications. Therefore, the following condition will be included on the permit to ensure compliance:

- {3202} This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. [District Rule 4702]

Section 6.5.7 specifies procedures and a schedule for using a portable NO_x analyzer to take NO_x emission readings pursuant to Section 5.8.9. The applicant has proposed that the alternate monitoring program will ensure compliance with this Section of the Rule. The following condition will ensure compliance with this requirement:

- {3787} 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 Rule 4702]

Section 6.5.8 specifies procedures for collecting and recording required data and other information in a form approved by the APCO including, but not limited to, data collected through the I&M plan and the monitoring systems described in Sections 5.8.1 and 5.8.2. Data collected through the I&M plan shall have retrieval capabilities as approved by the APCO. The applicant has proposed that the alternate monitoring program will ensure compliance with this Section of the Rule. The following condition will ensure compliance with this requirement:

- The permittee shall maintain records of: (1) the date and time of NOx, CO, O_2, and NH_3 measurements, (2) the O_2 concentration in percent and the measured NOx, CO, and NH_3 concentrations corrected to 15% O_2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH_3 emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]

Section 6.5.9 specifies procedures for revising the I&M plan. The I&M plan shall be updated to reflect any change in operation. The I&M plan shall be updated prior to any planned change in operation. An engine operator that changes significant I&M plan elements must notify the District no later than seven days after the change and must submit an updated I&M plan to the APCO no later than 14 days after the change for approval. The date and time of the change to the I&M plan shall be recorded in the engine operating log. For new engines and modifications to existing engines, the I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit-to-Operate or Permit-Exempt Equipment Registration. The operator of an engine may request a change to the I&M plan at any time. The applicant has proposed that they will modify their I&M plan per this section of the Rule. Therefore, the following condition will be placed on the permit to ensure continued compliance:

- {3212} The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702]

Section 7.1 requires that the owner of an engine which becomes subject to the emission limits of this rule through loss of exemption shall not operate the subject engine, except as required for obtaining a new or modified Permit-to-Operate for the engine, until the owner demonstrates full compliance with the requirements of this rule.

The engines in this project did not become subject to this rule through a loss of exemption; therefore, the requirements of this section are not applicable.

Section 7.5.1 requires an operator with non-AO spark-ignited engines at a stationary source subject to Table 2 or Section 8.0 emission limits, SOx control requirements of Section 5.7, and the SOx monitoring requirements of Section 5.10 shall comply with the schedule specified in Table 5.

Table 5 Compliance Schedule for Non-AO Spark-Ignited Engines Subject to Table 2 Emission Limits, and SOx Control and Monitoring Requirements

Engines to be in Compliance at a Stationary Source	Emission Control Plan	Authority to Construct and Inspection and Monitoring Plan	Full Compliance
Operator with at least two engines, but less than 12 engines at a stationary source			
33% or more of the engines subject to Table 2 emission limits as of August 18, 2011	7/1/12	1/1/13	1/1/14
66% or more of the engines subject to Table 2 emission limits as of August 18, 2011	7/1/12	1/1/14	1/1/15
100% of the engines subject to Table 2 emission limits	7/1/12	1/1/15	1/1/16

The engines involved with this project will meet all the requirements of Rule 4702 at the time of initial operation. Therefore, the engines are in meet the compliance schedule requirements of Table 5.

Section 8.0 allows that an operator may comply with the NOx emission requirements of Section 5.2 for a group of engines by meeting the requirements below. An operator that is subject to the requirements below shall also comply with all the applicable requirements of Sections 5.0, 6.0, and 7.0. Only engines subject to Section 5.2 are eligible for inclusion in an AECP.

The applicant has not proposed an Alternative Emission Control Plan (AECP). Therefore, this section of the Rule is not applicable to the engines involved with this project.

Therefore, compliance with the requirements of this Rule is expected.

Rule 4801 Sulfur Compounds

Rule 4801 requires that sulfur compound emissions (as SO_2) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

Volume SO_2 = (n x R x T) ÷ P
n = moles SO_2
T (standard temperature) = 60 °F or 520 °R
R (universal gas constant) = $\frac{10.73\,psi \cdot ft^3}{lb \cdot mol \cdot {}^\circ R}$

Digester Gas Fuel

$$40 \quad \frac{scf-H_2S}{MMscf-fuel} \times \frac{lbmol-H_2S}{379.5\,scf-H_2S} \times \frac{lbmol-SO_2}{lbmol-H_2S} \times \frac{1\,scf-fuel}{900\,Btu} \times \frac{1\,MMBtu}{1{,}000{,}000\,scf} \times \frac{10.73\,psi-ft^3}{lb-mol-{}^\circ R} \times \frac{520\,{}^\circ R}{14.7\,psi} \times 1{,}000{,}000 = \quad 4.5 \quad \text{ppmv}$$

Since the SOx concentration is ≤ 2,000 ppmv, the engine is expected to comply with Rule 4801.

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)

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

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

The County of Merced (County) is the public agency having principal responsibility for approving the project. As such, the County served as the Lead Agency (CCR §15367). In approving the project, the Lead Agency prepared and adopted a Mitigated Negative Declaration. The Lead agency filed a Notice of Determination, stating that the environmental document was adopted pursuant to the provisions of CEQA and concluding that the project would not have a significant effect on the environment.

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CCR §15381). As a Responsible Agency the District complies with CEQA by considering the environmental document prepared by the Lead Agency, and by reaching its own conclusion on whether and how to approve the project (CCR §15096).

The District has considered the Lead Agency's environmental document. Furthermore, the District has conducted an engineering evaluation of the project, this document, which demonstrates that Stationary Source emissions from the project would be below the District's thresholds of significance for criteria pollutants. Thus, the District finds that through a combination of project design elements, compliance with applicable District rules and regulations, and compliance with District air permit conditions, project specific stationary source emissions will have a less than significant impact on air quality. The District does not have authority over any of the other project impacts and has, therefore, determined that no additional findings are required (CEQA Guidelines §15096(h)).

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Pending a successful NSR Public Noticing period, issue Authorities to Construct N-1237-605-0 and '606-0 subject to the permit conditions on the attached draft Authorities to Construct in Attachment D.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
N-1237-605-0	3020-10-F	1,393 hp IC engine	$749.00
N-1237-606-0	3020-10-F	1,393 hp IC engine	$749.00

Attachments

A: Waste Gas-Fired IC Engine BACT Guideline 3.3.15 and Top Down BACT Analysis
B: Health Risk Assessment and Ambient Air Quality Analysis
C: Compliance Certification
D: Draft ATCs

Attachment A

Waste Gas-Fired IC Engine BACT Guideline 3.3.15 and Top Down BACT Analysis

SJVAPCD Best Available Control Technology (BACT) Guideline 3.3.15*
Last Update: XX/XX/2013

Waste Gas-Fired IC Engine**

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
NO_X	0.15 g/bhp-hr (lean-burn engine with SCR, rich-burn engine with 3-way catalyst, or other equivalent)		1. Fuel Cells (<0.05 lb/MW-hr) 2. Microturbines (<9 ppmv @ 15% O_2) 3. Gas Turbine (<9 ppmv @ 15% O_2) *(Note: gas turbines only ABE for projects ≥ 3 MW)*
SO_X	Sulfur content of fuel gas ≤ 40 ppmv (as H_2S) (dry absorption, wet absorption, chemical H_2S reduction, water scrubber, or equivalent) (may be averaged up to 24 hours for compliance)		
PM_{10}	Sulfur content of fuel gas ≤ 40 ppmv (as H_2S)		
CO	2.0 g/bhp-hr		1. Fuel Cells (<0.10 lb/MW-hr) 2. Microturbines (<60 ppmv @ 15% O_2) 3. Gas Turbine (<60 ppmv @ 15% O_2) *(Note: gas turbines only ABE for projects ≥ 3 MW)*
VOC	0.10 g/bhp-hr (lean burn and positive crankcase ventilation (PCV) or a 90% efficient crankcase control device or equivalent)		Fuel Cells (<0.02 lb-VOC/MW-hr as CH_4)
Ammonia (NH_3) Slip	≤ 10 ppmv @ 15% O_2		

** *For the purposes of this determination, waste gas is a gas produced from the digestion of material excluding municipal sources such as waste water treatment plants, landfills, or any source where siloxane impurities are a concern.*

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

***This is a Summary Page for this Class of Source - Permit Specific BACT Determinations on Next Pages**

Draft 3.3.15 1st Qtr. 2013

Top Down BACT Anlaysis:
Waste Gas-Fired IC Engine BACT Guideline 3.3.15

BACT Guideline 3.3.15 for waste-gas fired IC engines was revised in project S-1120734. The revisions will be used for the waste gas-fired IC engines in this project.

1. NOx Top-Down BACT Analysis for Permit Unit N-1237-605-0 and '606-0

Step 1 – Identify all control technologies

The following control technologies and alternative equipment options have been identified for waste gas-fired IC engines.

1) NO_X emissions ≤ 0.15 g/bhp-hr (Non-Selective Catalytic Reduction (NSCR) for rich burn engines, Selective Catalytic Reduction (SCR) for lean burn engines, or equivalent) (Achieved in Practice)
2) Gas Turbine (< 9 ppmv NO_X @ 15% O_2) (Alternate Basic Equipment for projects ≥ 3 MW see below for explanation)
3) Microturbine (< 9 ppmv NO_X @ 15% O_2) (Alternate Basic Equipment)
4) Fuel Cell (< 0.05 lb/MW-hr) (Alternate Basic Equipment)

Turbine manufacturers Solar Turbines, Siemens, Allison, and General Electric do not produce or market waste gas-fired gas turbines rated less than 3 MW since this size range is generally covered by other generation technologies such as reciprocating IC engines and microturbines. The proposed project would require a gas turbine rated 1000 kW, which is below the range that is currently being marketed by turbine manufacturers such as Solar Turbines, Siemens, Allison, and General Electric.

Step 2 - Eliminate Technologically Infeasible Options

All of the options listed above are considered to be feasible with the exception of option 2.

Option 2 is determined to be infeasible for the following reasons:

2) Gas Turbine (< 9 ppmv NO_X @ 15% O_2) (Alternate Basic Equipment)

Turbine manufacturers Solar Turbines, Allison, and General Electric do not produce or market waste gas-fired gas turbines rated less than 3 MW since this size range is generally covered by other generation technologies such as reciprocating IC engines and microturbines. The proposed project would require a gas turbine rated 1000 kW, which is below the range that is currently being marketed by turbine manufacturers such as Solar Turbines, Allison, and General Electric; therefore, gas turbines are not considered feasible for this particular project and will be eliminated from consideration at this time.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Rank	Control Technology	Achieved in Practice
1	Fuel Cells < 0.05 lb/MW-hr	N
2	Microturbines < 9 ppmv @ 15% O_2	N
3	0.15 g/bhp-hr (lean-burn engine with SCR, rich-burn engine with 3-way catalyst, or other equivalent)	Y

There are no remaining control technologies for NOx.

Step 4 - Cost Effectiveness Analysis

Pursuant to Section IX.D of District Policy APR 1305 – BACT Policy, a cost effectiveness analysis is required for the options that have not been determined to be achieved in practice. In accordance with the District's Revised BACT Cost Effectiveness Thresholds Memo (5/14/08), to determine the cost effectiveness of particular technologically feasible control options or alternate equipment options, the amount of emissions resulting from each option will be quantified and compared to the District Standard Emissions allowed by the District Rule that is applicable to the particular unit. The emission reductions will be equal to the difference between the District Standard Emissions and the emissions resulting from the particular option being evaluated.

The proposed digester gas-fired engine is a lean burn, digester gas-fired, engine is subject to the District Rule 4702 emission limits for non-agricultural, lean burn, waste gas-fired IC engines. Therefore, in accordance with the District's Revised BACT Cost Effectiveness Thresholds Memo, the District Standard Emissions used for the BACT cost analysis below for the proposed engine will be based on the emission limits for non-agricultural, lean burn, waste gas-fired IC engines contained in District Rule 4702, Section 5.1.1, Table 2, 2.d (11 ppmvd NO_X, 2,000 ppmvd CO, and 750 ppmvd VOC (all measured @ 15% O_2)).

Option 1: Fuel Cells < 0.05 lb-NOx/MW-hr (Alternate Basic Equipment)

Since Fuel Cells have reduced NO_X, CO, and VOC emissions in comparison to a reciprocating IC engine, a Multi-Pollutant Cost Effectiveness Threshold (MCET) will be used to determine if this option is cost-effective. The following cost analysis demonstrates that replacement of the proposed engine with a fuel cell is not cost effective even when the additional operation costs of a fuel cell are not considered.

Assumptions

Assumptions for Proposed Digester Gas-Fired IC Engines

- Hours of Operation for the Engine = 8,760 (worst case)
- Waste gas F-Factor: 9,800 dscf/MMBtu (60 °F)
- Higher Heating Value for Waste Gas: 900 Btu/scf

- Molar Specific Volume = 379.5 scf/lb-mol (60 °F)
- Price for electricity: $0.08843/kW-hr (based on California Renewable Energy Tariff for projects on-line in 2011)
- BHP to Btu/hr conversion: 2,542.5 Btu/hp-hr
- Btu to kW-hr conversion: 3,413 Btu/kW-hr
- Typical mechanical efficiency for engine: 35%
- Generator Efficiency: 95%
- The total annual heating input of the digester gas combusted in either one of the proposed engines (N-1237-605 or '606) will not exceed 88,644 MMBtu/year (1,393 bhp x 24 hr/day x 365 day/year x 2,542.5 Btu/hp-hr x 1 hp-hr_{in}/0.35 hp-hr_{out} x 1 MMBtu/10^6 Btu). This is equivalent to 98.5 MMscf/year based on a digester gas heating value of 900 Btu/scf.
- Typical purchase and Installation Cost for digester engines: $1,475/kW (estimated based on review conducted by District)
- Typical operation costs for engines: $0.0152/kW-hr (estimated based on review conducted by District)
- Rule 4702 NO_X emission limit for non-agricultural, lean burn, waste gas-fired IC engines: 11 ppmv @ 15% O_2 (0.0456 lb/MMBtu) = 0.44 lb/MW-hr @ 35% engine efficiency
- Rule 4702 CO emission limit for non-agricultural, lean burn, waste gas-fired IC engines: 2000 ppmv @ 15% O_2 (5.0455 lb/MMBtu) = 49.2 lb/MW-hr @ 35% engine efficiency
- Rule 4702 VOC emission limit for non-agricultural, lean burn, waste gas-fired IC engines: 750 ppmv @ 15% O_2 as CH_4 (1.08 lb/MMBtu) = 10.53 lb/MW-hr @ 35% engine efficiency

Assumptions for Fuel Cell System

- Net electrical efficiency for fuel cell power plant: 39% (includes parasitic load for gas conditioning system)
- Typical Purchase and Installation Cost for fuel cells including cost for waste gas conditioning system: $7,000/kW (based on review conducted by District)
- Typical operation costs for fuel cells: $0.0215/kW-hr (based on review conducted by District)
- Fuel Cell Stack Replacement Cost: $500/kW-yr (conservatively estimated based stack replacement being one quarter of initial installation cost and stack replacement being required every 3.5 years) [1]
- Fuel Cell NO_X emissions: 0.05 lb/MW-hr = 0.0051 lb/MMBtu *(Note: fuel cells are usually certified to the ARB Distributed Generation Certification level of 0.07 lb-NO_X/MW-hr; however, measured emissions from many fuel cells have been lower)*
- Fuel Cell CO emissions: 0.10 lb/MW-hr = 0.01 lb/MMBtu (based on ARB Distributed Generation Certification level of 0.10 lb-VOC/MW-hr)
- Fuel Cell VOC emissions: 0.02 lb/MW-hr = 0.0021 lb/MMBtu (based on ARB Distributed Generation Certification level of 0.02 lb-VOC/MW-hr and emission tests on fuel cells)
- Size of fuel cell system needed for proposed project: 1156 kW (88,644 MMBtu/year x year/8760 hr x 10^6 Btu/MMBtu x 1 kW-hr/3,413 Btu x 0.39 (electrical efficiency))

[1] Examples of fuel cell stack replacement costs and intervals are provided in the following links:
http://www.ornl.gov/sci/femp/pdfs/020501-Hughes-fuelcell-WashingtonDC.pdf,
http://masstech.org/Project%20Deliverables/GB_GSI_FeasibilityStudy_Gill_Montague.pdf,
http://www.epa.gov/chp/documents/catalog_chptech_fuel_cells.pdf
http://dodfuelcell.cecer.army.mil/climate/reports/AK_PostOfficeReport.pdf
http://www.fuelcellenergy.com/files/Copy%20of%20DFC300MA%20Spec%20_9318.pdf

- Fuel cells may offer the ability for greater heat recovery in comparison to an IC engine; however, the value of this heat will not be quantified since it is not known if the facility has an economical use for it.

Capital Cost

The estimated increased incremental capital cost for replacement of one of the proposed 1,393 bhp IC engines with a fuel cell is calculated based on the difference in cost of a fuel cell power plant and the IC engine.

The incremental capital cost for replacement of the proposed IC engine with a fuel cell is calculated as follows:

1156 kW x ($7,000/kW – $1,475/kW) = $6,386,900

Annualized Capital Cost

Pursuant to District Policy APR 1305, section X (11/09/99), the incremental capital cost for the purchase of the fuel cell system will be spread over the expected life of the system using the capital recovery equation. The expected life of the entire system will be estimated at 10 years. A 10% interest rate is assumed in the equation and the assumption will be made that the equipment has no salvage value at the end of the ten-year cycle.

$$A = [P \times i(I+1)^n]/[(I+1)^n-1]$$

Where: A = Annual Cost
P = Present Value
I = Interest Rate (10%)
N = Equipment Life (10 years)

$$A = \$6,386,900 \times [0.1(1.1)^{10}]/[(1.1)^{10}-1]$$
$$= \mathbf{\$1,039,439/year}$$

Annual Costs

Electricity Generated

The amount of electricity potentially generated by each option is calculated as follows:

Proposed IC Engine
1000 kW x 24 hr/day x 365 day/yr = 8,760,000 kW-hr/year

Fuel Cells (Alternate Equipment)
88,644 MMBtu/year x year/8760 hr x 10^6 Btu/MMBtu x 1 kW-hr/3,413 Btu x 0.39 (electrical efficiency) = 1156 kW

88,644 MMBtu/year x 10^6 Btu/MMBtu x 1 kW-hr/3,413 Btu x 0.39 (electrical efficiency) = 10,129,259 kW-hr/year

Revenue from Increased Electric Generation from a Fuel Cell Power Plant
(10,129,259 kW-hr/year – 8,760,000 kW-hr/year) x $0.08843/kW-hr = $121,084/year

Annual Operation and Maintenance Cost
The annual operation and maintenance costs for each option are calculated as follows:

Proposed IC Engines
8,760,000 kW-hr/year x $0.0152/kW-hr = $133,152/year

Fuel Cells (Alternate Equipment)
10,129,259 kW-hr/year x $0.0215/kW-hr = $217,779/year

Annual Costs of Increased Maintenance
$217,779/year – $133,152/year = $84,627/year

Fuel Cell Stack Replacement Costs
$500/kW-yr x 1156 kW = $578,000/year

Total Increased Annual Costs for Fuel Cell System as an Alternative to Proposed Engines

Annual Capital Cost – Revenue from Increased Electric Generation from a Fuel Cell Power Plant + Annual Costs of Increased Maintenance + Fuel Cell Stack Replacement Costs

$1,039,439/year – $121,084/year + $84,627/year + $578,000/year = **$1,580,982/year**

Emission Reductions:

Pursuant to the District's Revised BACT Cost Effectiveness Thresholds Memo (5/14/08), District Standard Emissions that will be used to compare with the alternative equipment will be based on the emission limits for lean burn non-agricultural IC engines contained in District Rule 4702, Section 5.2, Table 2, 2.d. The following emissions factors will be used for the cost analysis:

District Standard Emissions:
0.44 lb-NO_X/MW-hr (11 ppmv NO_X @ 15% O_2)
49.2 lb-CO/MW-hr (2000 ppmv CO @ 15% O_2)
10.53 lb-VOC/MW-hr (750 ppmv VOC @ 15% O_2 as CH_4)

Emissions from Fuel Cells as Alternative Equipment:
0.05 lb-NO_X/MW-hr
0.10 lb-CO/MW-hr
0.02 lb-VOC/MW-hr

NO_X Emission Reductions
1000 kW x 8760 hours/year x 1 MW/1,000 kW x (0.44 lb-NO_X/MW-hr – 0.05 lb-NO_X/MW-hr)
= 3,416 lb-NO_X/year (1.71 ton/year)

CO Emission Reductions
1000 kW x 8760 hours/year x 1 MW/1,000 kW x (49.2 lb-CO/MW-hr – 0.10 lb-CO/MW-hr) = 430,116 lb-CO/year (215.1 ton/year)

VOC Emission Reductions
1000 kW x 8760 hours/year x 1 MW/1,000 kW x (10.53 lb-VOC/MW-hr – 0.02 lb-VOC/MW-hr) = 92,068 lb-VOC/year (46.0 ton/year)

Multi-Pollutant Cost Effectiveness Thresholds (MCET) for NO_X, CO, and VOC Reductions based on District Standard Emission Reductions

(1.71 ton-NO_X/year x $24,500/ton-$NO_X$) + (215.1 ton-CO/year x $300/ton-CO) + (46.0 ton-VOC/year x $17,500/ton-VOC)
= **$911,425/year**

As shown above, the annualized capital cost of this alternate option exceeds the Multi-Pollutant Cost Effectiveness Threshold (MCET) calculated for the NO_X, CO, and VOC emission reductions even when the additional operational costs are not considered. Therefore, this option is not cost effective and is being removed from consideration.

Option 2: Microturbines < 9 ppmv NO_X @ 15% O_2 (Alternate Basic Equipment)

Assumptions

- Biogas F-Factor: 9,800 dscf/MMBtu (60 °F)
- Higher Heating Value for Dairy Digester Gas: 900 Btu/scf
- Molar Specific Volume = 379.5 scf/lb-mol (60°F)
- Btu to kW-hr conversion: 3,413 Btu/kW-hr
- Price for electricity: $0.08843/kW-hr (based on California Renewable Energy Tariff)

Assumptions for Proposed Digester Gas-Fired IC Engines

- Typical mechanical efficiency for lean burn engine: 35%
- Generator Efficiency: 96%
- Engine fuel consumption rate = 11,244 scf/hr (1,393 bhp x 2,542.5 Btu/hp-hr x 1 hp-hr_{in}/0.35 hp-hr_{out} x scf/900 Btu)
- Typical purchase and Installation Cost for lean burn engines: $1,475/kW (estimated based on review conducted by District)
- Typical operation costs for engines: $0.0152/kW-hr (estimated based on review conducted by District)
- Rule 4702 NO_X emission limit for non-agricultural, lean burn, waste gas-fired IC engines: 11 ppmv @ 15% O_2 (0.0456 lb/MMBtu)

Assumptions for Microturbine System

- Net electrical efficiency for large microturbine: 28% (includes parasitic load for gas conditioning system)

- Typical Purchase and Installation Cost for large microturbine including cost for biogas conditioning system: $2,000/kW (estimated based on extensive review conducted by District and contacts with microturbine suppliers)
- Typical operation costs for microturbines: $0.0145/kW-hr (based on review conducted by District)
- Microturbine NO_X emissions: 0.0373 lb/MMBtu (9 ppmv @ 15% O_2) *(note: conservative value based on typical manufacturers guarantee; NO_X emissions from biogas-fired microturbines have generally been measured at half this level or less)*
- Size of microturbine system needed for proposed project: 1156 kW (see Option 1: Fuel Cells assumption section)
- Microturbines may offer the ability for greater heat recovery in comparison to an IC engine; however, the value of this heat will not be quantified since it is not known if the facility has an economical use for it.
- Although some microturbines require removal of sulfur in the fuel gas to 40 ppmv H_2S or less, this cost was not included since scrubbing biogas to this level is required as achieved in practice BACT for SO_X and PM emissions from digester gas-fired units. Also, at least some of this cost is included in the operating costs for microturbines.

Capital Cost

The estimated increased incremental capital cost for replacement of the proposed engines with microturbines is calculated based on the difference in cost of microturbines and IC engines for an 1156 kW system. The incremental capital cost for replacement of the proposed IC engines with microturbines is calculated as follows:

1156 kW x ($2,000/kW – $1,475/kW) = $606,900

Annualized Capital Cost

Pursuant to District Policy APR 1305, section X (11/09/99), the incremental capital cost for the purchase of microturbines will be spread over the expected life of the system using the capital recovery equation. The expected life of the entire system will be estimated at 10 years. A 10% interest rate is assumed in the equation and the assumption will be made that the equipment has no salvage value at the end of the ten-year cycle.

$$A = [P \times i(I+1)^n]/[(I+1)^n-1]$$

Where: A = Annual Cost
P = Present Value
I = Interest Rate (10%)
N = Equipment Life (10 years)

$$A = \$606,900 \times [0.1(1.1)^{10}]/[(1.1)^{10}-1]$$
$$= \mathbf{\$98,770/year}$$

Annual Costs

Electricity Generated

The amount of electricity potentially generated by each option is calculated as follows:

Proposed IC Engines
11,244 scf/hr x 900 Btu/scf x 1 kW-hr/3,413 Btu x 0.35 (engine efficiency) x 0.96 (generator efficiency) = 996.2 kW

11,244 scf/hr x 900 Btu/scf x 1 kW-hr/3,413 Btu x 0.35 (engine efficiency) x 0.96 (generator efficiency) x 8,760 hr/year = 8,727,110 kW-hr/year

Microturbines (Alternate Equipment)
11,244 scf/hr x 900 Btu/scf x 1 kW-hr/3,413 Btu x 0.28 (electrical efficiency) = 830.2 kW

11,244 scf/hr x 900 Btu/scf x 1 kW-hr/3,413 Btu x 0.28 (electrical efficiency) x 8,760 hr/yr = 7,272,592 kW-hr/year

Annual Costs of Lost Electric Generation
(8,727,110 kW-hr/yr - 7,272,592 kW-hr/yr) x $0.08843/kW-hr = $128,623/year

Annual Operation and Maintenance Cost

The annual operation and maintenance costs for each option are calculated as follows:

Proposed IC Engines
8,727,110 kW-hr/yr x $0.0152/kW-hr = $132,652/year

Microturbines (Alternate Equipment)
7,272,592 kW-hr/yr x $0.0145/kW-hr = $105,453/year

Annual Costs of Increased Maintenance
$105,453/year - $132,652/year = - $27,199/year

Total Increased Annual Costs for Microturbine System as an Alternative to Proposed Engines

Annual Capital Cost + Annual Cost of Lost Electric Generation + Annual Costs of Increased Maintenance

$98,770/year + $128,623/year - $27,199/year = **$200,194/year**

Emission Reductions:

Pursuant to the District's Revised BACT Cost Effectiveness Thresholds Memo (5/14/08), District Standard Emissions that will be used to compare with the alternative equipment will be based on the emission limits for lean burn non-agricultural IC engines contained in District Rule 4702, Section 5.2, Table 2, 2.d. The following emission factors will be used for the cost analysis:

District Standard Emissions: 0.0456 lb-NO_X/MMBtu (11 ppmv NO_X @ 15% O_2)

Emissions from Microturbines as Alternative Equipment: 0.0373 lb-NO_X/MMBtu (9 ppmv @ 15% O_2)

NO_X Emission Reductions of Microturbines Compared to Proposed Engines based on Non-Agricultural Lean Burn Engines (11 ppmv → 9 ppmv):

98.5 MMscf/year x 900 Btu/scf x (0.0456 lb-NO_X/MMBtu - 0.0373 lb-NO_X/MMBtu)
= 736 lb-NO_X/year (0.37 ton/year)

Cost of NO_X Emission Reductions of Microturbines Compared to Proposed Engines:

Cost of reductions = (Total annualized costs) ÷ (NO_X reduction)
= ($200,194/year) ÷ (0.37 ton-NO_X/year)
= **$541,065/ton**

As shown above, the cost of the NO_X emission reductions from this alternative option is greater than the $24,500/ton cost effectiveness threshold of the District BACT policy. Therefore, this option is not cost effective and is being removed from consideration.

Option 3: NO_X emissions ≤ 0.15 g/bhp-hr (Achieved in Practice)

The applicant has proposed this option; therefore a cost analysis is not required.

Step 5 - Select BACT

Pursuant to the above Top-Down BACT Analysis, BACT for the digester gas-fired engine must be satisfied with the following:

NO_X: NO_X emissions ≤ 0.15 g/bhp-hr (Achieved in Practice)

The applicant has proposed to apply an SCR system to a lean burn IC engine to reduce NO_X emissions to ≤ 0.15 g/bhp-hr. Therefore, the BACT requirements are satisfied.

2. PM_{10} Top-Down BACT Analysis for Permit Unit N-1237-605-0 and '606-0

Combustion of gaseous fuels generally does not result in significant emissions of particulate matter. Waste gas is the planned fuel for the proposed IC engines. Waste gas is primarily of methane and CO_2 and is expected to burn in a fairly clean manner. Particulate emissions from combustion of the waste gas are expected to primarily result from the incineration of fuel-born sulfur compounds (mostly H_2S) resulting in the formation of sulfur-containing particulate. Therefore, limiting the sulfur content of the waste gas is the principal means to reduce particulate emissions.

Step 1 – Identify all control technologies

The following control technology has been identified for waste gas-fired IC engines.

1) Sulfur Content of fuel gas ≤ 40 ppmv (as H2S) (90-98% - Achieved in Practice/Contained in SIP)

There are no options listed in the SJVUAPCD BACT Clearinghouse as alternate basic equipment.

Step 2 - Eliminate Technologically Infeasible Options

All of the options listed above are considered to be feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Rank	Control Technology	Achieved in Practice
1	Sulfur Content of fuel gas ≤ 40 ppmv (as H2S)	Y

There are no remaining control technologies for PM_{10}.

Step 4 - Cost Effectiveness Analysis

The applicant has proposed the use of a two phase biogas scrubber consisting of a liquid biological oxidation gas wet scrubber and an activated carbon adsorption polishing filter to reduce the sulfur content of the gas combusted in the engine to ≤ 40 ppmv as H_2S. Because the applicant has chosen the most effective option listed above, reducing the fuel sulfur content to ≤ 40 ppmv as H_2S, no cost analysis is required.

Step 5 - Select BACT

Pursuant to the above Top-Down BACT Analysis, BACT for the digester gas-fired engine must be satisfied with the following:

PM_{10}: Fuel sulfur content ≤ 40 ppmv (as H_2S) (Achieved in Practice)

The applicant has proposed to utilize a wet scrubber and carbon adsorption unit to reduce the sulfur content in the fuel gas to ≤ 40 ppmv (as H_2S). Therefore, the BACT requirements are satisfied.

3. CO Top-Down BACT Analysis for Permit Unit N-1237-605-0 and '606-0

Step 1 – Identify all control technologies

The following control technology has been identified for waste gas-fired IC engines.

1) CO emissions ≤ 2.0 g/bhp-hr (Achieved in Practice)
2) Microturbines (< 60 ppmv @ 15% O_2) (Alternate Basic Equipment)
3) Fuel Cell (≤ 0.10 lb/MW-hr) (Alternate Basic Equipment)

Step 2 - Eliminate Technologically Infeasible Options

All of the options listed above are considered to be feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Rank	Control Technology	Achieved in Practice
1	Fuel Cells < 0.10 lb/MW-hr	N
2	Microturbine < 60 ppmv @ 15% O_2	N
3	CO emissions ≤ 2.0 g/bhp-hr	Y

There are no remaining control technologies for CO.

Step 4 - Cost Effectiveness Analysis

Option 1: Fuel Cells ≤ 0.10 lb-CO/MW-hr (Alternate Basic Equipment)

The multi-pollutant cost analysis performed above for the NO_X, CO, and VOC emissions demonstrated that the annualized cost of this alternate option exceeds the Multi Pollutant Cost Effectiveness Threshold calculated for the NO_X, CO, and VOC emission reductions achieved by this technology. Therefore, this option is not cost effective and is being removed from consideration.

Option 2: Microturbines < 60 ppmv CO @ 15% O_2 (Alternate Basic Equipment)

Assumptions

- Biogas F-Factor: 9,800 dscf/MMBtu (60 °F)
- Higher Heating Value for Dairy Digester Gas: 900 Btu/scf
- Molar Specific Volume = 379.5 scf/lb-mol (60°F)
- Btu to kW-hr conversion: 3,413 Btu/kW-hr
- Price for electricity: $0.08843/kW-hr (based on California Renewable Energy Tariff)

Assumptions for Proposed Digester Gas-Fired IC Engines

- Typical mechanical efficiency for lean burn engine: 35%
- Generator Efficiency: 96%
- Engine fuel consumption rate = 11,244 scf/hr (1,393 bhp x 2,542.5 Btu/hp-hr x 1 hp-hr_{in}/0.35 hp-hr_{out} x scf/900 Btu)
- Typical purchase and Installation Cost for lean burn engines: $1,475/kW (estimated based on review conducted by District)
- Typical operation costs for engines: $0.0152/kW-hr (estimated based on review conducted by District)
- Rule 4702 CO emission limit for non-agricultural, lean burn, waste gas-fired IC engines: 2,000 ppmv @ 15% O_2 (5.0455 lb/MMBtu)

Assumptions for Microturbine System

- Net electrical efficiency for large microturbine: 28% (includes parasitic load for gas conditioning system)
- Typical Purchase and Installation Cost for large microturbine including cost for biogas conditioning system: $2,000/kW (estimated based on extensive review conducted by District and contacts with microturbine suppliers)
- Typical operation costs for microturbines: $0.0145/kW-hr (based on review conducted by District)
- Microturbine CO emissions: 0.1514 lb/MMBtu (60 ppmv @ 15% O_2)
- Size of microturbine system needed for proposed project: 1156 kW (see Option 1: Fuel Cells assumption section)
- Microturbines may offer the ability for greater heat recovery in comparison to an IC engine; however, the value of this heat will not be quantified since it is not known if the facility has an economical use for it.
- Although some microturbines require removal of sulfur in the fuel gas to 40 ppmv H_2S or less, this cost was not included since scrubbing biogas to this level is required as achieved in practice BACT for SO_X and PM emissions from digester gas-fired units. Also, at least some of this cost is included in the operating costs for microturbines.

Capital Cost

The estimated increased incremental capital cost for replacement of the proposed engines with microturbines is calculated based on the difference in cost of microturbines and IC engines for an 1000 kW system. The incremental capital cost for replacement of the proposed IC engines with microturbines is calculated as follows:

1156 kW x ($2,000/kW – $1,475/kW) = $606,900

Annualized Capital Cost

Pursuant to District Policy APR 1305, section X (11/09/99), the incremental capital cost for the purchase of microturbines will be spread over the expected life of the system using the capital recovery equation. The expected life of the entire system will be estimated at 10 years. A 10% interest rate is assumed in the equation and the assumption will be made that the equipment has no salvage value at the end of the ten-year cycle.

$$A = [P \times i(I+1)^n]/[(I+1)^n-1]$$

Where: A = Annual Cost
P = Present Value
I = Interest Rate (10%)
N = Equipment Life (10 years)

$$A = \$606,900 \times [0.1(1.1)^{10}]/[(1.1)^{10}-1]$$
$$= \mathbf{\$98,770/year}$$

Annual Costs

Electricity Generated

The amount of electricity potentially generated by each option is calculated as follows:

Proposed IC Engines
11,244 scf/hr x 900 Btu/scf x 1 kW-hr/3,413 Btu x 0.35 (engine efficiency) x 0.96 (generator efficiency) = 996.2 kW

11,244 scf/hr x 900 Btu/scf x 1 kW-hr/3,413 Btu x 0.35 (engine efficiency) x 0.96 (generator efficiency) x 8,760 hr/year = 8,727,110 kW-hr/year

Microturbines (Alternate Equipment)
11,244 scf/hr x 900 Btu/scf x 1 kW-hr/3,413 Btu x 0.28 (electrical efficiency) = 830.2 kW

11,244 scf/hr x 900 Btu/scf x 1 kW-hr/3,413 Btu x 0.28 (electrical efficiency) x 8,760 hr/yr = 7,272,592 kW-hr/year

Annual Costs of Lost Electric Generation
(8,727,110 kW-hr/yr - 7,272,592 kW-hr/yr) x $0.08843/kW-hr = $128,623/year

Annual Operation and Maintenance Cost

The annual operation and maintenance costs for each option are calculated as follows:

Proposed IC Engines
8,727,110 kW-hr/yr x $0.0152/kW-hr = $132,652/year

Microturbines (Alternate Equipment)
7,272,592 kW-hr/yr x $0.0145/kW-hr = $105,453/year

Annual Costs of Increased Maintenance
$105,453/year - $132,652/year = - $27,199/year

Total Increased Annual Costs for Microturbine System as an Alternative to Proposed Engines

Annual Capital Cost + Annual Cost of Lost Electric Generation + Annual Costs of Increased Maintenance

$98,770/year + $128,623/year - $27,199/year = **$200,194/year**

Emission Reductions:

Pursuant to the District's Revised BACT Cost Effectiveness Thresholds Memo (5/14/08), District Standard Emissions that will be used to compare with the alternative equipment will be based on the emission limits for lean burn non-agricultural IC engines contained in District Rule 4702, Section 5.2, Table 2, 2.d. The following emission factors will be used for the cost analysis:

District Standard Emissions: 5.0455 lb-CO/MMBtu (2,000 ppmv CO @ 15% O_2)

Emissions from Microturbines as Alternative Equipment: 0.1514 lb-NO_X/MMBtu (60 ppmv @ 15% O_2)

CO Emission Reductions of Microturbines Compared to Proposed Engines based on Non-Agricultural Lean Burn Engines (2000 ppmv → 60 ppmv):

98.5 MMscf/year x 900 Btu/scf x (5.0455 lb-CO/MMBtu - 0.1514 lb-CO/MMBtu)
= 433,862 lb-NO_X/year (216.9 ton/year)

Cost of CO Emission Reductions of Microturbines Compared to Proposed Engines:

Cost of reductions = (Total annualized costs) ÷ (CO reduction)
= ($200,194/year) ÷ (216.9 ton-NO_X/year)
= **$923/ton**

As shown above, the cost of the CO emission reductions from this alternative option is greater than the $300/ton cost effectiveness threshold of the District BACT policy. Therefore, this option is not cost effective and is being removed from consideration.

Option 3: CO Emissions ≤ 2.0 g/bhp-hr (Achieved in Practice)

This option listed above has been identified as achieved in practice for CO emissions. Therefore, a cost analysis is not necessary.

Step 5 - Select BACT

Pursuant to the above Top-Down BACT Analysis, BACT for the digester gas-fired engine must be satisfied with the following:

CO: CO emissions ≤ 2.0 g/bhp-hr (Achieved in Practice)

The applicant has proposed a CO emission limit of 0.8 g/bhp-hr. Therefore, the BACT requirements are satisfied.

4. VOC Top-Down BACT Analysis for Permit Unit N-1237-605-0 and '606-0

Step 1 – Identify all control technologies

The following control technology has been identified for waste gas-fired IC engines.

1) VOC emissions ≤ 0.10 g/bhp-hr (Achieved in Practice)
2) Fuel Cell (≤ 0.02 lb/MW-hr) (Alternate Basic Equipment)

Step 2 - Eliminate Technologically Infeasible Options

All of the options listed above are considered to be feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Rank	Control Technology	Achieved in Practice
1	Fuel Cells < 0.02 lb/MW-hr	N
2	VOC emissions ≤ 0.10 g/bhp-hr	Y

There are no remaining control technologies for VOC.

Step 4 - Cost Effectiveness Analysis

Option 1: Fuel Cells ≤ 0.02 lb-VOC/MW-hr (Alternate Basic Equipment)

The multi-pollutant cost analysis performed above for the NO_X, CO, and VOC emissions demonstrated that the annualized cost of this alternate option exceeds the Multi Pollutant Cost Effectiveness Threshold calculated for the NO_X, CO, and VOC emission reductions achieved by this technology. Therefore, this option is not cost effective and is being removed from consideration.

Option 2: VOC Emissions ≤ 0.10 g/bhp-hr (Achieved in Practice)

This option listed above has been identified as achieved in practice for VOC emissions. Therefore, a cost analysis is not necessary.

Step 5 - Select BACT

Pursuant to the above Top-Down BACT Analysis, BACT for the digester gas-fired engine must be satisfied with the following:

VOC: VOC emissions ≤ 0.10 g/bhp-hr (Achieved in Practice)

The applicant has proposed a VOC emission limit of 0.10 g/bhp-hr. Therefore, the BACT requirements are satisfied.

5. NH_3 Top-Down BACT Analysis for Permit Unit N-1237-605-0 and '606-0

A Selective Catalytic Reduction (SCR) system operates as an external control device where flue gases and a reagent, in this case ammonia, are passed through an appropriate catalyst. Ammonia, will be injected upstream of the catalyst where it reacts and reduces NO_X, over the catalyst bed, to form elemental nitrogen and other by-products. The use of a catalyst typically reduces the NO_X emissions by up to 90%.

Ammonia slip results when unreacted ammonia exits the SCR system.

Step 1 – Identify all control technologies

The following control technology has been identified for waste gas-fired IC engines.

1) NH_3 emissions ≤ 10 ppmvd @ 15% O_2 (Achieved in Practice)

Step 2 - Eliminate Technologically Infeasible Options

All of the options listed above are considered to be feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Rank	Control Technology	Achieved in Practice
1	NH_3 emissions ≤ 10 ppmvd @ 15% O_2	Y

There are no remaining control technologies for NH_3.

Step 4 - Cost Effectiveness Analysis

This option listed above has been identified as achieved in practice for NH_3 emissions. Therefore, a cost analysis is not necessary.

Step 5 - Select BACT

Pursuant to the above Top-Down BACT Analysis, BACT for the digester gas-fired engine must be satisfied with the following:

NH_3: NH_3 emissions ≤ 10 ppmvd @ 15% O_2 (Achieved in Practice)

The applicant has proposed a NH_3 emission limit of 10 ppmvd. Therefore, the BACT requirements are satisfied.

Attachment B

Health Risk Assessment and Ambient Air Quality Analysis

San Joaquin Valley Air Pollution Control District
Revised Risk Management Review

To:	Stanley Tom – Permit Services
From:	Leland Villalvazo – Technical Services
Date:	September 10, 2012
Facility Name:	E & J Gallo
Location:	18000 W. River Rd.
Application #(s):	N-1237-605-0 & 606-0
Project #:	N-1121959

A. RMR SUMMARY

RMR Summary				
Categories	**Digester ICE (605-0)**	**Digester ICE (606-0)**	**Project Totals**	**Facility Totals**
Prioritization Score	0.115	0.115	0.229	0.248
Acute Hazard Index	NA	NA	NA	NA
Chronic Hazard Index	NA	NA	NA	NA
Maximum Individual Cancer Risk (10^{-6})	NA	NA	NA	NA
T-BACT Required?	**No**	**No**		
Special Permit Conditions?	**No**	**No**		

Proposed Permit Conditions

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

Unit # 605-0 & 606-0

No special conditions are required.

B. RMR REPORT

I. Project Description

Technical Services received a request on Aug 9, 2012, to perform a Risk Management Review for a proposed installation of two 1393hp Digester Gas fired IC engine powering an electrical generator.

II. Analysis

Toxic emissions for this proposed unit were calculated using District approved Digester Gas for Internal Combustion. 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:

Analysis Parameters Units 605-0, 606-0			
Throughput (MMSCF/yr)	91.98	**Max Hours per Year**	8760
Closest Receptor (m)	609.6		

Analysis Parameters Units 605-0, 606-0			
Source Type	Point	**Location Type**	Urban
Stack Height (m)	7.9248	**Closest Receptor (m)**	609.6
Stack Diameter. (m)	0.1524	**Type of Receptor**	Business
Stack Exit Velocity (m/s)	167.1346	**Max Hours per Year**	8760
Stack Exit Temp. (°K)	728.1512	**Fuel Type**	Digester Gas

In addition to the RMR, Technical Services performed modeling for criteria pollutants using AERMOD to determine if the project would contribute to or cause a violation of a CAAQS or NAAQS. The results of the modeling are presented below.

Criteria Pollutant Modeling Results*

Diesel ICE	1 Hour	3 Hours	8 Hours.	24 Hours	Annual
CO	NA	X	NA	X	X
NO_x	NA	X	X	X	Pass
SO_x	NA	NA	X	NA	Pass
PM_{10}	X	X	X	NA	Pass[1]
$PM_{2.5}$	X	X	X	NA	Pass[1]

*Results were taken from the attached PSD spreadsheet.
[1]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).**

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

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

IV. Attachments

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

AAQA for E & J Gallo (N1121959)
All Values are in ug/m^3

	NOx 1 Hour	NOx Annual	CO 1 Hour	CO 8 Hour	SOx 1 Hour	SOx 3 Hour	SOx 24 Hour	SOx Annual	PM 24 Hour	PM Annual
605	8.056E-01	6.460E-02	4.282E+00	3.340E+00	1.960E-01	1.907E-01	9.814E-02	1.593E-02	8.723E-02	1.422E-02
606	8.154E-01	6.400E-02	4.334E+00	3.386E+00	1.983E-01	1.866E-01	9.723E-02	1.578E-02	8.642E-02	1.408E-02
Background	9.374E+01	1.530E+01	2.214E+03	1.398E+03	1.598E+02	1.332E+02	7.193E+01	2.664E+01	7.500E+01	3.900E+01
Facility Totals	9.536E+01	1.543E+01	2.222E+03	1.405E+03	1.602E+02	1.336E+02	7.213E+01	2.667E+01	7.517E+01	3.903E+01
AAQS	188.68	56	23000	10000	195	1300	105	80	50	30
	Pass	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**	**Fail**	**Fail**
									0.17365	0.0283

EPA's Significance Level (ug/m^3)

NOx 1 Hour	NOx Annual	CO 1 Hour	CO 8 Hour	SOx 1 Hour	SOx 3 Hour	SOx 24 Hour	SOx Annual	PM_{10} 24 Hour	PM_{10} Annual
0.0	1.0	2000.0	500.0	0.0	25.0	5.0	1.0	5.0	1.0
								PASS	PASS

Ads 0.261 0.0425

$PM_{2.5}$ $PM_{2.5}$

1.2 0.3

PASS PASS

AAQA Emission (g/sec)

Device	NOx 1 Hour	NOx Annual	CO 1 Hour	CO 8 Hour	SOx 1 Hour	SOx 3 Hour	SOx 24 Hour	SOx Annual	PM 24 Hour	PM Annual
605	5.83E-02	5.80E-02	3.10E-01	3.10E-01	1.42E-02	1.42E-02	1.42E-02	1.43E-02	1.26E-02	1.28E-02
606	5.83E-02	5.80E-02	3.10E-01	3.10E-01	1.42E-02	1.42E-02	1.42E-02	1.43E-02	1.26E-02	1.28E-02

Attachment C
Compliance Certification

N-1237
E&J Gallo Winery-Livingston
Compliance Certification Statement
For Federal Major Permit Modifications
Compliance with District Rule 2201, Section 4.15.2

"I certify under penalty of law that all major stationary sources (Title V facilities) operated under my control in California are compliant with all applicable air emissions limitations and standards. The facilities included in this certification statement include the E&J Gallo Winery-Fresno, the E&J Gallo Winery-Livingston, and the E&J Gallo Winery-Modesto."

Mr. Steve Kidd
Vice President of Operations

06/22/12
Date

Attachment D

Draft ATCs

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: N-1237-605-0

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: E & J GALLO WINERY
MAILING ADDRESS: ATTN: EHS MANAGER
18000 W RIVER RD
LIVINGSTON, CA 95334

LOCATION: 18000 W RIVER RD
LIVINGSTON, CA 95334

EQUIPMENT DESCRIPTION:
1,393 BHP CUMMINS MODEL QSK60G LEAN BURN DIGESTER GAS-FIRED IC ENGINE WITH TURBOCHARGER, INTERCOOLER, AIR/FUEL RATIO CONTROLLER, AND SELECTIVE CATALYTIC REDUCTION WITH AMMONIA INJECTION COGENERATION SYSTEM SERVED BY A TWO PHASE SULFUR SCRUBBER SYSTEM CONSISTING OF ONE LIQUID BIOLOGICAL OXIDATION WET SCRUBBER AND TWO ACTIVATED CARBON ADSORPTION POLISHING FILTERS SHARED WITH PERMIT N-1237-606

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. Prior to operating equipment under this Authority to Construct, permittee shall surrender NOx emission reduction credits for the following quantity of emissions: 1st quarter - 967 lb, 2nd quarter - 967 lb, 3rd quarter - 967 lb, and fourth quarter - 968 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 04/21/11). [District Rule 2201] Federally Enforceable Through Title V Permit
3. Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter - 645 lb, 2nd quarter - 645 lb, 3rd quarter - 645 lb, and fourth quarter - 645 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 04/21/11). [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 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

Northern Regional Office • 4800 Enterprise Way • Modesto, CA 95356-8718 • (209) 557-6400 • Fax (209) 557-6475

4. ERC Certificate Numbers N-2-2, N-849-2, N-972-2, N-1010-2, N-1011-2, N-1012-2, N-2-1, S-3714-1, S-3805-1, S-3807-1, S-3808-1 (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
5. All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201] Federally Enforceable Through Title V Permit
6. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
7. 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
8. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit
9. The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
10. The unit shall only be fired on digester gas. [District Rule 2201] Federally Enforceable Through Title V Permit
11. Only one activated carbon unit need be operated at any one time. [District Rule 2201] Federally Enforceable Through Title V Permit
12. The operator shall submit an Inspection and Monitoring (I&M) plan to the District for approval that includes all of the data required under Section 6.5 of Rule 4702 prior to installing the equipment authorized by this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
13. This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. [District Rule 4702] Federally Enforceable Through Title V Permit
14. This engine shall be operated and maintained in proper operating condition according to the manufacturer's specifications. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit
15. Air-to-fuel ratio controller(s) shall be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [District Rule 2201 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit
16. This engine shall be equipped with a nonresettable elapsed operating time meter or other APCO approved alternative. [District Rules 2201 and 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit
17. This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201] Federally Enforceable Through Title V Permit
18. Operation of the engine shall not exceed 8,400 hours/year. [District Rule 2201] Federally Enforceable Through Title V Permit
19. Emissions from the IC engine when fired on digester gas shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr, 0.025 g-SOx/bhp-hr (based on 40 ppmv sulfur content in fuel (as H2S)), 0.033 g-PM10/bhp-hr, 0.8 g-CO/bhp-hr, or 0.10 g-VOC/bhp-hr. [District Rules 2201 and 4702, and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit
20. The ammonia (NH3) emission concentration shall not exceed 10 ppmvd @ 15% O2. [District Rules 2201 and 4102] Federally Enforceable Through Title V Permit
21. Source testing to measure digester gas fuel combustion NOx, CO, VOC and ammonia emissions from this unit shall be conducted within 60 days of initial start-up and once every 8,760 hours of operation or 24 months, whichever comes first, thereafter. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

22. The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, and VOC (ppmv) - EPA Method 18 or 25A or 25B or ARB Method 100. [District Rules 1081 and 4702] Federally Enforceable Through Title V Permit

23. Source testing for ammonia slip shall be conducted utilizing BAAQMD method ST-1B. [District Rule 1081] Federally Enforceable Through Title V Permit

24. The permittee shall monitor and record the stack concentration of NOx and O2 at least once every day (in which a source test is not performed). NOx and O2 concentrations shall be performed using a portable emission monitor that meets District specifications. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702 and 40 CFR 64] Federally Enforceable Through Title V Permit

25. The permittee shall monitor and record the stack concentration of CO and NH3 at least once every month (in which a source test is not performed). CO concentrations shall be performed using a portable emission monitor that meets District specifications. NH3 monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702] Federally Enforceable Through Title V Permit

26. If the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, or the NH3 concentrations corrected to 15% O2, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours 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 2201 and 4702] Federally Enforceable Through Title V Permit

27. 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 Rule 4702] Federally Enforceable Through Title V Permit

28. The permittee shall maintain records of: (1) the date and time of NOx, CO, O2, and NH3 measurements, (2) the O2 concentration in percent and the measured NOx, CO, and NH3 concentrations corrected to 15% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH3 emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702] Federally Enforceable Through Title V Permit

29. The sulfur content of the digester gas combusted in this engine shall be monitored and recorded weekly. After eight (8) consecutive weekly tests show compliance, the digester gas sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the digester gas sulfur content limit of this permit, then weekly monitoring shall resume and continue until eight consecutive weeks of monitoring show compliance with the gas sulfur content limit. Once compliance with the gas sulfur content limit is shown for eight consecutive weeks, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas shall not be required if the engine does not operate during that period. Records of the results of monitoring of the digester gas sulfur content shall be maintained. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

30. Monitoring of the digester gas sulfur content shall be performed using a Testo 350 XL portable emission monitor; District-approved in-line H2S monitors; gas detection tubes calibrated for H2S; District-approved source test methods, including EPA Method 11 or EPA Method 15, ASTM Method D1072, D4084, and D5504; or an alternative method approved by the District. Prior to utilization of in-line monitors to demonstrate compliance with the digester gas sulfur content limit of this permit, the permittee shall submit details of the proposed monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201] Federally Enforceable Through Title V Permit

31. Sampling ports for digester gas testing shall be provided in accordance with District requirements. [District Rule 1081] Federally Enforceable Through Title V Permit

32. For initial emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. NOx, CO and VOC concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

33. {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]

34. Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

35. The results of each source test shall be submitted to the District and EPA within 60 days after completion of the source test. [District Rule 1081 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

36. The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702] Federally Enforceable Through Title V Permit

37. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type and quantity of fuel used, maintenance or modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

38. Notification of the date construction of this engine commenced shall be submitted to the District and EPA and shall be postmarked no later than 30 days after such date as construction commenced. The notification shall contain the following information: 1) Name and address of the owner or operator; 2) The address of the affected source; 3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement; 4) Emission control equipment; and 5) Fuel used. [40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

39. 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 Rule 4702] Federally Enforceable Through Title V Permit

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: N-1237-606-0

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: E & J GALLO WINERY
MAILING ADDRESS: ATTN: EHS MANAGER
18000 W RIVER RD
LIVINGSTON, CA 95334

LOCATION: 18000 W RIVER RD
LIVINGSTON, CA 95334

EQUIPMENT DESCRIPTION:
1,393 BHP CUMMINS MODEL QSK60G LEAN BURN DIGESTER GAS-FIRED IC ENGINE WITH TURBOCHARGER, INTERCOOLER, AIR/FUEL RATIO CONTROLLER, AND SELECTIVE CATALYTIC REDUCTION WITH AMMONIA INJECTION COGENERATION SYSTEM SERVED BY A TWO PHASE SULFUR SCRUBBER SYSTEM CONSISTING OF ONE LIQUID BIOLOGICAL OXIDATION WET SCRUBBER AND TWO ACTIVATED CARBON ADSORPTION POLISHING FILTERS SHARED WITH PERMIT N-1237-605

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. Prior to operating equipment under this Authority to Construct, permittee shall surrender NOx emission reduction credits for the following quantity of emissions: 1st quarter - 967 lb, 2nd quarter - 967 lb, 3rd quarter - 967 lb, and fourth quarter - 968 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 04/21/11). [District Rule 2201] Federally Enforceable Through Title V Permit
3. Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter - 645 lb, 2nd quarter - 645 lb, 3rd quarter - 645 lb, and fourth quarter - 645 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 04/21/11). [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 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
N-1237-606-0 : May 2 2013 2:51PM – TOMS : Joint Inspection NOT Required

4. ERC Certificate Numbers N-2-2, N-849-2, N-972-2, N-1010-2, N-1011-2, N-1012-2, N-2-1, S-3714-1, S-3805-1, S-3807-1, S-3808-1 (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
5. All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201] Federally Enforceable Through Title V Permit
6. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
7. 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
8. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit
9. The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
10. The unit shall only be fired on digester gas. [District Rule 2201] Federally Enforceable Through Title V Permit
11. Only one activated carbon unit need be operated at any one time. [District Rule 2201] Federally Enforceable Through Title V Permit
12. The operator shall submit an Inspection and Monitoring (I&M) plan to the District for approval that includes all of the data required under Section 6.5 of Rule 4702 prior to installing the equipment authorized by this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
13. This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. [District Rule 4702] Federally Enforceable Through Title V Permit
14. This engine shall be operated and maintained in proper operating condition according to the manufacturer's specifications. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit
15. Air-to-fuel ratio controller(s) shall be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [District Rule 2201 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit
16. This engine shall be equipped with a nonresettable elapsed operating time meter or other APCO approved alternative. [District Rules 2201 and 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit
17. This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201] Federally Enforceable Through Title V Permit
18. Operation of the engine shall not exceed 8,400 hours/year. [District Rule 2201] Federally Enforceable Through Title V Permit
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20. The ammonia (NH3) emission concentration shall not exceed 10 ppmvd @ 15% O2. [District Rules 2201 and 4102] Federally Enforceable Through Title V Permit
21. Source testing to measure digester gas fuel combustion NOx, CO, VOC and ammonia emissions from this unit shall be conducted within 60 days of initial start-up and once every 8,760 hours of operation or 24 months, whichever comes first, thereafter. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

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22. The following test methods shall be used: NOx (ppmv) - EPA Method 7E or ARB Method 100, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, and VOC (ppmv) - EPA Method 18 or 25A or 25B or ARB Method 100. [District Rules 1081 and 4702] Federally Enforceable Through Title V Permit

23. Source testing for ammonia slip shall be conducted utilizing BAAQMD method ST-1B. [District Rule 1081] Federally Enforceable Through Title V Permit

24. The permittee shall monitor and record the stack concentration of NOx and O2 at least once every day (in which a source test is not performed). NOx and O2 concentrations shall be performed using a portable emission monitor that meets District specifications. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702 and 40 CFR 64] Federally Enforceable Through Title V Permit

25. The permittee shall monitor and record the stack concentration of CO and NH3 at least once every month (in which a source test is not performed). CO concentrations shall be performed using a portable emission monitor that meets District specifications. NH3 monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702] Federally Enforceable Through Title V Permit

26. If the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, or the NH3 concentrations corrected to 15% O2, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours 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 2201 and 4702] Federally Enforceable Through Title V Permit

27. 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 Rule 4702] Federally Enforceable Through Title V Permit

28. The permittee shall maintain records of: (1) the date and time of NOx, CO, O2, and NH3 measurements, (2) the O2 concentration in percent and the measured NOx, CO, and NH3 concentrations corrected to 15% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH3 emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702] Federally Enforceable Through Title V Permit

29. The sulfur content of the digester gas combusted in this engine shall be monitored and recorded weekly. After eight (8) consecutive weekly tests show compliance, the digester gas sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the digester gas sulfur content limit of this permit, then weekly monitoring shall resume and continue until eight consecutive weeks of monitoring show compliance with the gas sulfur content limit. Once compliance with the gas sulfur content limit is shown for eight consecutive weeks, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas shall not be required if the engine does not operate during that period. Records of the results of monitoring of the digester gas sulfur content shall be maintained. [District Rule 2201] Federally Enforceable Through Title V Permit

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31. Sampling ports for digester gas testing shall be provided in accordance with District requirements. [District Rule 1081] Federally Enforceable Through Title V Permit

32. For initial emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. NOx, CO and VOC concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

33. {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]

34. Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

35. The results of each source test shall be submitted to the District and EPA within 60 days after completion of the source test. [District Rule 1081 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

36. The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702] Federally Enforceable Through Title V Permit

37. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type and quantity of fuel used, maintenance or modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rule 4702 and 40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

38. Notification of the date construction of this engine commenced shall be submitted to the District and EPA and shall be postmarked no later than 30 days after such date as construction commenced. The notification shall contain the following information: 1) Name and address of the owner or operator; 2) The address of the affected source; 3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement; 4) Emission control equipment; and 5) Fuel used. [40 CFR 60 Subpart JJJJ] Federally Enforceable Through Title V Permit

39. 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 Rule 4702] Federally Enforceable Through Title V Permit