AUG - 4 2010

N. Ross Buckenham
ABEC Bidart-Old River LLC
c/o California Bioenergy LLC
2828 Routh Street Suite 500
Dallas, TX 75201-1438

Re: Notice of Preliminary Decision - Authority to Construct
Project Number: S-1100455

Dear Mr. Buckenham:

Enclosed for your review and comment is the District's analysis of ABEC Bidart-Old River LLC's application for an Authority to Construct for installation of 12 new 841 bhp rich burn digester gas-fired IC engines with Greenguard NSCR catalyst systems and an H2S removal system, at the existing Bidart Dairy facility located at 20400 Old River Road in Bakersfield, CA.

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. Please submit your written comments on this project within the 30-day public comment period which begins on the date of publication of the public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Ramon Norman of Permit Services at (559) 230-5909.

Sincerely,

David Warner
Director of Permit Services

DD:rn

Enclosures
AUG - 4 2010

Mike Tollstrup, Chief
Project Assessment Branch
Stationary Source Division
California Air Resources Board
PO Box 2815
Sacramento, CA 95812-2815

Re: Notice of Preliminary Decision - Authority to Construct
Project Number: S-1100455

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Sincerely,

David Warner
Director of Permit Services

Enclosure
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 ABEC Bidart-Old River LLC for installation of 12 new 841 bhp rich burn digester gas-fired IC engines with Greenguard NSCR catalyst systems and an H2S removal system, at the existing Bidart Dairy facility located at 20400 Old River Road in Bakersfield, CA.

The analysis of the regulatory basis for this proposed action, Project #S-1100455, is available for public inspection at http://www.valleyair.org/notices/public_notices_idx.htm and the District office at the address below. Written comments on this project must be submitted within 30 days of the publication date of this notice 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
12 Digester Gas-Fired IC Engines with NSCR powering Electrical Generators

Facility Name: ABEC Bidart-Old River, LLC
Facility Mailing Address: ABEC Bidart-Old River, LLC
C/O California Bioenergy, LLC
2828 Routh Street, Suite 500
Dallas, TX 75201-1438
Applicant: N. Ross Buckenham - California Bioenergy/ABEC Bidart-Old River
Telephone: (214) 849-9886
E-Mail: rbuckenham@calbioenergy.com
Consultant: Jennifer Meckel - Provost & Pritchard Consulting Group
Telephone: (559) 636-1166
E-Mail: jmeckel@ppeng.com
Application #:
S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0
Project #: S-1100455
Deemed Complete: June 30, 2010

I. Proposal

ABEC Bidart-Old River, LLC, a subsidiary of California Bioenergy, LLC, has requested Authority to Construct (ATC) permits to install 12 new 841 bhp digester gas-fired IC engines at Bidart Dairy, LLC (Facility S-4751). Each engine will be equipped with a non-selective catalytic reduction (NSCR) system for emissions control and will power a 600 kW electrical generator. Under a separate project (Project S-1102464), Bidart Dairy has requested an ATC permit to convert two existing lagoons at the dairy into covered lagoon anaerobic digesters to produce renewable biogas that will be used to fuel the IC engine generator sets.

ABEC Bidart-Old River, LLC and Bidart Dairy, which are separate companies, are undertaking the project as a partnership. ABEC Bidart-Old River, LLC has provided information supporting that the dairy and the ABEC biogas facility will be separately owned and operated. The following is a summary of some of the information provided by the applicant. The proposed covered lagoon digesters at the dairy will be operated and maintained by ABEC Bidart-Old River, LLC. The responsibility of the dairy will be limited to providing the manure feedstock and disposing of the effluent, which the dairy already must do for compliance with water quality regulations. ABEC Bidart-Old River, LLC will not be involved at all in the dairy's primary activity, production of milk. The feedstock and lease agreements specify that ABEC Bidart-Old River, LLC will build, own, and operate the biogas facility and also allows ABEC to make plant and equipment improvements. The proposed digester gas-fired IC engine generator sets that will be constructed on land leased from the dairy site and will be owned, operated, and maintained by ABEC Bidart-Old River, LLC. ABEC Bidart-Old River, LLC will be solely responsible for ensuring that the biogas plant and digester gas-fired IC engines comply with all applicable air quality regulations. The generator sets will sell all the power generated to the grid and will not provide any power directly to the dairy. Because the dairy and the proposed digester gas power plant at the site will be separately owned and operated and will have
different two-digit Standard Industrial Classification (SIC) codes (Industry Group 24: Dairy Farms for the Dairy vs. Industry Group 49: Electric, Gas, And Sanitary Services for the IC engine generator set), pursuant to Section 3.37 of District Rule 2201, the digester gas-fired IC engines will not be part of the dairy agricultural stationary source. Therefore the proposed digester gas-fired IC engines will be permitted at a new non-agricultural stationary source (S-7767) under this project.

The new 841 bhp digester gas-fired IC engines (ATCs S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0) will be subject to BACT for NOx emissions from the engines. Based on the information available regarding potential controls, the District has determined that a NOx emission limit of 0.15 g/bhp-hr is technologically feasible for digester gas-fired IC engines if the system is properly designed and constructed and there is sufficient cleanup of the biogas. This NOx emission limit has been applied to fossil fuel-fired IC engines for a number of years and the District has determined that technology has now sufficiently advanced to allow this limit to be applied to biogas gas-fired IC engines. However, although the District now considers 0.15 g-NOx/bhp-hr to be technologically feasible BACT for biogas-fired engines, there remains some uncertainty regarding whether this emission limit can be met consistently given the fact that many of the previous installations of catalysts on biogas-fired engines have not been successful. Because of the remaining uncertainty, conditions will be incorporated into the ATC permits allowing NOx emissions above 0.15 g-NOx/bhp-hr (but not greater than the achieved in practice BACT level of 0.6 g-NOx/bhp-hr) provided that the other conditions in the ATC are met and the applicant makes a satisfactory effort to reduce NOx emissions to the lowest possible level to satisfy BACT. This will allow the applicant to proceed with installation of innovative controls to reduce emissions without fear of receiving a violation for exceeding an emission limit that they are not certain the operation can consistently achieve.

The construction of the digester and installation of the IC engines at the dairy is a discretionary project subject to the requirements of the California Environmental Quality Act (CEQA). As a public agency with discretionary powers, the District has a responsibility to determine the significance of environmental impacts and ensure that the requirements of CEQA are satisfied. The project is located in Kern County. Because only manure produced at the dairy will be processed in the digester, Kern County has determined that no discretionary permit is required for the covered lagoon digester. Based on the District's analysis of the project, the District has determined that the proposed project will not adversely affect air quality and the overall project will not have a significant effect on the environment. Therefore, the project is exempt from the provisions of CEQA (CEQA Guidelines §1506(b)(3)).

II. Applicable Rules

Rule 2201 New and Modified Stationary Source Review Rule (12/18/08)
Rule 2520 Federally Mandated Operating Permits (6/21/01)
Rule 4101 Visible Emissions (2/17/05)
Rule 4102 Nuisance (12/17/92)
Rule 4201 Particulate Matter Concentration (12/17/92)
Rule 4701 Stationary Internal Combustion Engines – Phase 1 (8/21/03)
Rule 4702 Stationary Internal Combustion Engines – Phase 2 (1/18/07)
Rule 4801 Sulfur Compounds (12/17/92)
40 CFR Part 60, Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines
III. Project Location

The ABEC Bidart-Old River Stationary Source (Facility S-7767) is located on Bidart Dairy at 20400 Old River Road near Bakersfield, CA (Mt. Diablo Meridian T 32S, R 27E, Sec 5 in Kern County). The facility is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

The digester gas-fired engines will be 841 bhp PMSI Model Greenguard “Virtual Lean Burn” engines with NSCR systems powering 600 kW generators. The proposed “Virtual Lean Burn” engines will use inert gases (CO\textsubscript{2} in the digester gas and some re-circulated engine exhaust) instead of excess air as a heat sink during combustion of the fuel. The engines will be equipped with controls to maintain the proper ratio of fuel, inert gas, and oxygen. Because the fuel will be mixed with inert gases, higher compression ratios similar to lean-burn engines can be used to achieve higher mechanical efficiency. An important benefit of using inert gasses rather than excess air as the heat sink is that, because the exhaust will contain very little oxygen, NSCR can be used to reduce emissions rather than SCR.

Digester gas, which consists mostly of methane, the main component of natural gas, will be combusted in the IC engines to produce power. Hydrogen Sulfide (H\textsubscript{2}S) in the digester gas will be removed using an iron sponge dry scrubber or an equivalent H2S removal system and the gas will then be sent to the IC engines via plastic piping. The engines will power electrical generators that will produce power to be sold to the utility. Water from the lagoons will be used to cool the engine; this will increase the average temperature of the covered lagoon digesters, which will lead to more efficient production of biogas. The engines are expected to primarily operate during peak electrical consumption hours but will be permitted to operate up to 24 hr/day and 8,760 hr/year.

V. Equipment Listing

The proposed digester gas-fired IC engines will be identical units and the equipment description for each of the units is as follows

ATCs S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR
VI. Emission Control Technology Evaluation

The proposed engines will be equipped with:
- Positive Crankcase Ventilation (PCV) or 90% efficient control device
- Non-Selective Catalytic Reduction
- Air/Fuel Ratio or an O₂ Controller
- Iron sponge H₂S Scrubber (or equivalent H₂S removal system)

The PCV system reduces crankcase VOC and PM₁₀ emissions by at least 90% over an uncontrolled crankcase vent.

Non-Selective Catalytic Reduction (NSCR) is an add-on control technology that can be applied to rich burn engines. NSCR reduces 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. NSCR requires the exhaust to have no more than 0.5% oxygen because unburned hydrocarbons in the exhaust are used as the reducing agent. The use of NSCR requires precise controls to keep the air-to-fuel ratio in the proper range to achieve the desired emission reductions.

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

Hydrogen Sulfide (H₂S) will be removed from the digester gas by passing the gas through a vessel containing iron sponge or an equivalent sulfur removal system. Iron sponge consists of a hydrated form of iron oxide impregnated onto wood shavings. The wood shavings serve only as a carrier for the iron oxide powder. As the gas passes through the iron sponge material, the H₂S is removed by the following chemical reaction producing black iron sulfide and water:

\[ \text{H}_2\text{S} + \text{Fe(OH)}_2 \rightarrow \text{FeS} + 2\text{H}_2\text{O} + \text{heat} \]

After the digester gas passes through the iron sponge, the H₂S content will be no more than 50 ppmv. The useful life of the iron sponge vessel will vary depending on the inlet concentration of H₂S, the flow rate, and the mass of the iron sponge. Before the iron sponge is completely spent, it must be regenerated or replaced.

VII. General Calculations

A. Assumptions
- ABEC Bidart-Old River, LLC (Facility S-7767) and Bidart Dairy (Facility S-4751) are separate stationary sources at the same site.
- Molar composition of typical digester biogas is about 60% methane and 40% carbon dioxide with trace amounts of hydrogen sulfide, VOC, and other compounds.¹
- Typical Higher Heating Value for Dairy biogas: 600 Btu/scf

- Typical EPA F-factor for Biogas: 9,100 dscf/MMBtu (Dry, adjusted to 60 °F), (Estimated based on previous biogas fuel analyses for source tests for Permits N-1660-7 & -9 and Project S-1053738)

- Sulfur content of the scrubbed biogas: 50 ppmv as H₂S (proposed by applicant)

- BHP to Btu/hr conversion: 2,545 Btu/hp-hr

- Thermal efficiency of engine: commonly ≈ 33%

- Molar Specific Volume = 379.5 scf/lb-mol (60°F)

- Molecular weights:
  \[ \text{NO}_x \text{ (as NO}_2\text{)} = 46 \text{ lb/lb-mol} \]
  \[ \text{CO} = 28 \text{ lb/lb-mol} \]
  \[ \text{VOC (as methane)} = 16 \text{ lb/lb-mol} \]
  \[ \text{SO}_x \text{ (as SO}_2\text{)} = 64.06 \text{ lb/lb-mol} \]

- The NSCR systems that will be installed on the proposed IC engines to satisfy the BACT requirement for NO\textsubscript{x} are expected to reduce NO\textsubscript{x} emissions from the engines to 0.15 g/bhp-hr; therefore NO\textsubscript{x} emissions from the engines will be calculated based on this emission factor. However, to ensure that all potential NSR requirements (i.e. public notice and any applicable offsetting) are satisfied if it is later determined that the emission factor must be raised because the units cannot consistently meet 0.15 g/bhp-hr, NO\textsubscript{x} emissions from the engines will also be calculated in this evaluation for the worst-case NO\textsubscript{x} emission factor of 0.6 g/bhp-hr, which is the current achieved in practice BACT level.

- Each of the engines will be permitted to operate 24 hours/day and 365 days per year.

- The digester gas-fired engines will be limited to a maximum total combined annual heat input of 185,000 MMBtu/yr for all engines.

- To avoid surpassing the 20,000 lb/yr offset threshold for NO\textsubscript{x}, the applicant has proposed to limit the total NO\textsubscript{x} emissions from the engines to 19,999 lb during any consecutive 12-month rolling period. Compliance with this limit will be determined based on the monthly fuel input and source test results.

Assumptions for Commissioning Period

- The applicant has requested that the ATC permits include a commissioning period to allow testing, adjustment, tuning, and calibration of the engine without the catalyst installed. The duration of the commissioning period will be no more than 30 days and shall consist of no more than 200 hours of operation of each engine without the catalysts installed (proposed by applicant).

- Engine emissions during the commissioning period will be calculated as uncontrolled.

- No more than four of the engines will be operating for commissioning purposes at the same time.

B. Emission Factors

Emission Factors during the Commissioning Period:

The commissioning period precedes normal operation of a power plant. Activities conducted during the commissioning period typically include: checking all mechanical,
electrical, and control systems for the units and related equipment; confirming the performance measures specified for the equipment; test firing the units; and tuning of the units and the generators. The early stages of commissioning are conducted prior to the installation of the emission control equipment to prevent its damage. In accordance with EPA’s guidance, the commissioning period is considered the final phase of the construction process rather than initial startup of the equipment. Therefore, other than quantifying emissions for New and Modified Source Review (NSR), source-specific emission limitations from applicable rules and regulations are generally not effective until completion of the commissioning period. Because the emission control devices will not be in place and functioning during the commissioning period, higher emission limits are required during this time.

The uncontrolled emission factors for NO\textsubscript{x} (8.0 g/bhp-hr) and CO (8.0 g/bhp-hr) for the commissioning period were proposed by the applicant. SO\textsubscript{x} emissions are based on the maximum sulfur content of the dairy digester gas (50 ppmv as H\textsubscript{2}S – proposed by applicant). PM\textsubscript{10} and VOC emissions on a lb/MMBtu basis are assumed to be similar to natural gas. The more conservative VOC emission factor for lean burn natural gas-fired engines will be used since the CO\textsubscript{2} in biogas reduces the flame temperature in the engines resulting in similar combustion characteristics as lean burn engines.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>g/hp・hr</th>
<th>lb/MBBtu</th>
<th>ppmvd (\textsubscript{@15%O\textsubscript{2}})</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO\textsubscript{x}</td>
<td>8.0</td>
<td>2.287</td>
<td>589 ppmvd</td>
<td>Proposed by Applicant – See equation below</td>
</tr>
<tr>
<td>SO\textsubscript{x}</td>
<td>0.0492</td>
<td>0.0141</td>
<td>50 ppmvd in fuel gas</td>
<td>Proposed by Applicant/Mass Balance Equation Below</td>
</tr>
<tr>
<td>PM\textsubscript{10}</td>
<td>0.07</td>
<td>0.01941</td>
<td>--</td>
<td>AP-42 (7/00) Table 3.2-3 (Value for Natural Gas)</td>
</tr>
<tr>
<td>CO</td>
<td>8.0</td>
<td>2.287</td>
<td>967 ppmvd</td>
<td>Proposed by Applicant – See equation below</td>
</tr>
<tr>
<td>VOC</td>
<td>0.414</td>
<td>0.118</td>
<td>87 ppmvd as CH\textsubscript{4}</td>
<td>AP-42 (7/00) Table 3.2-2 (Value for lean burn Natural Gas engine) – see equation below</td>
</tr>
</tbody>
</table>

**NO\textsubscript{x} – 8.0 g/bhp-hr**

\[
\frac{8.0 \text{g NO}_x}{\text{bhp-hr}} \times \frac{1 \text{lb}}{453.59 \text{g}} \times \frac{1 \text{hp-hr}}{2545 \text{Btu}} \times \frac{0.33 \text{Btu}_{\text{in}}}{1 \text{Btu}_{\text{out}}} \times \frac{10^6 \text{Btu}}{1 \text{MMBtu}} \times \frac{2.287 \text{lb NO}_x}{1 \text{MMBtu}} = 589 \text{ ppmvd NO}_x \text{@15\% O}_2
\]

\[
2.287 \times \frac{\text{lb NO}_x}{\text{MMBtu}} \times \frac{(20.95 - 15)\% \text{O}_2}{20.95\% \text{O}_2} \times \frac{1 \text{MMBtu}}{9100 \text{ft}^3} \times \frac{379.5 \text{ft}^3}{\text{lb-mole}} \times \frac{10^6 \text{ppmv}}{46 \text{lb NO}_x} = 589 \text{ ppmvd NO}_x \text{@15\% O}_2
\]

**SO\textsubscript{x} – 50 ppmvd H\textsubscript{2}S in fuel gas**

\[
\frac{50 \text{ft}^3 \text{H}_2\text{S}}{10^6 \text{ft}^3} \times \frac{32.06 \text{lb S}}{\text{lb-mole}} \times \frac{64.06 \text{lb SO}_2}{379.5 \text{ft}^3} \times \frac{32.06 \text{S lb}}{600 \text{Btu}} \times \frac{10^6 \text{Btu}}{1 \text{MMBtu}} = 0.0141 \times \frac{\text{lb SO}_x}{\text{MMBtu}}
\]

\[
0.0141 \times \frac{\text{lb SO}_x}{\text{MMBtu}} \times \frac{1 \text{MMBtu}}{10^6 \text{Btu}} \times \frac{0.33 \text{Btu}_{\text{in}}}{1 \text{Btu}_{\text{out}}} \times \frac{2545 \text{Btu}}{\text{hp-hr}} \times \frac{453.59 \text{g}}{1 \text{lb}} = 0.0492 \times \frac{\text{g SO}_x}{\text{bhp-hr}}
\]

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Emission Factors during Normal Operation after the Commissioning Period:

The post-project emission factors for NO\textsubscript{x} (0.15 g/bhp-hr), CO (1.75 g/bhp-hr), and VOC (0.15 g/bhp-hr) from the proposed engines were proposed by the applicant. SO\textsubscript{x} emissions are based on the maximum sulfur content of the dairy digester gas (50 ppmv as H\textsubscript{2}S – proposed by applicant). PM\textsubscript{10} emissions from the proposed engine are assumed to be similar to natural gas on a lb/MMBtu basis.

The emission factors for the IC engine after the commissioning period are given below.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>g/bhp-hr</th>
<th>lb/MMBtu</th>
<th>ppmvd (@ 15% O\textsubscript{2})</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO\textsubscript{x}</td>
<td>0.15</td>
<td>0.0429</td>
<td>11 ppmvd</td>
<td>BACT Requirement; Proposed by Applicant – See equation below</td>
</tr>
<tr>
<td>NO\textsubscript{x} Worst-case</td>
<td>0.60</td>
<td>0.172</td>
<td>44 ppmvd</td>
<td>Worst-Case Achieved in Practice BACT Requirement – See equation below</td>
</tr>
<tr>
<td>SO\textsubscript{x}</td>
<td>0.0492</td>
<td>0.0141</td>
<td>50 ppmvd in fuel gas</td>
<td>Proposed by Applicant/Mass Balance Equation Above</td>
</tr>
<tr>
<td>PM\textsubscript{10}</td>
<td>0.07</td>
<td>0.01941</td>
<td>--</td>
<td>AP-42 (7/00) Table 3.2-3 (Value for Natural Gas)</td>
</tr>
<tr>
<td>CO</td>
<td>1.75</td>
<td>0.500</td>
<td>212 ppmvd</td>
<td>Proposed by Applicant – See equation below</td>
</tr>
<tr>
<td>VOC</td>
<td>0.15</td>
<td>0.0429</td>
<td>32 ppmvd as CH\textsubscript{4}</td>
<td>Proposed by Applicant – See equation below</td>
</tr>
</tbody>
</table>

NO\textsubscript{x} - 0.15 g/bhp-hr

\[
0.15 \text{ g NO}_x \text{ bhp-hr} \times \frac{1 \text{ lb}}{453.59 \text{ g}} \times \frac{1 \text{ hp-hr}}{2.545 \text{ Btu}} \times \frac{0.33 \text{ Btu}_{\text{out}}}{1 \text{ Btu}_{\text{in}}} \times \frac{10^6 \text{ Btu}}{1 \text{ MMBtu}} = 0.429 \text{ lb NO}_x \text{ MMBtu} \\
0.429 \text{ lb NO}_x \text{ MMBtu} \times \frac{(20.95 - 15)\% \text{ O}_2}{20.95\% O_2} \times \frac{1 \text{ MMBtu}}{379.5 \text{ ft}^3} \times \frac{1 \text{ lb-mole}}{28 \text{ lb CO}} \times \frac{10^6 \text{ ppmv}}{1} = 11.0 \text{ ppmvd NO}_x @ 15\% O_2
\]
Worst Case \( \text{NO}_x \) – 0.60 g/bhp-hr
\[
0.60 \frac{\text{g NO}_x}{\text{bhp-hr}} \times \frac{1 \text{ lb}}{453.59 \text{ g}} \times \frac{1 \text{ hp - hr}}{2.545 \text{ Btu}} \times \frac{0.33 \text{ Btu}}{1 \text{ Btu}_{\text{in}}} \times \frac{10^6 \text{ Btu}}{1 \text{ MMBtu}} \times \frac{1 \text{ lb NO}_x}{0.172 \text{ MMBtu}} = 0.172 \frac{\text{lb NO}_x}{\text{MMBtu}}
\]
\[
0.172 \frac{\text{lb NO}_x}{\text{MMBtu}} \times \frac{(20.95 - 15)\%}{\text{O}_2} \times \frac{1 \text{ MMBtu}}{9,100 \text{ ft}^3} \times \frac{1 \text{ lb - mole}}{46 \text{ lb NO}_x} \times \frac{10^6 \text{ ppmv}}{1} = 44 \text{ ppmv NO}_x \text{ @ 15} \% \text{ O}_2
\]

CO – 1.75 g/bhp-hr
\[
1.75 \frac{\text{g CO}}{\text{bhp-hr}} \times \frac{1 \text{ lb}}{453.59 \text{ g}} \times \frac{1 \text{ hp - hr}}{2.545 \text{ Btu}} \times \frac{0.33 \text{ Btu}}{1 \text{ Btu}_{\text{in}}} \times \frac{10^6 \text{ Btu}}{1 \text{ MMBtu}} \times \frac{1 \text{ lb CO}}{0.500 \text{ MMBtu}} = 0.500 \frac{\text{lb CO}}{\text{MMBtu}}
\]
\[
0.500 \frac{\text{lb CO}}{\text{MMBtu}} \times \frac{(20.95 - 15)\%}{\text{O}_2} \times \frac{1 \text{ MMBtu}}{9,100 \text{ ft}^3} \times \frac{1 \text{ lb - mole}}{28 \text{ lb CO}} \times \frac{10^6 \text{ ppmv}}{1} = 212 \text{ ppmv CO \text{ @ 15} \% \text{ O}_2}
\]

VOC – 0.15 g/bhp-hr
\[
0.15 \frac{\text{g VOC}}{\text{bhp-hr}} \times \frac{1 \text{ lb}}{453.59 \text{ g}} \times \frac{1 \text{ hp - hr}}{2.545 \text{ Btu}} \times \frac{0.33 \text{ Btu}}{1 \text{ Btu}_{\text{in}}} \times \frac{10^6 \text{ Btu}}{1 \text{ MMBtu}} \times \frac{1 \text{ lb VOC}}{0.0429 \text{ MMBtu}} = 0.0429 \frac{\text{lb VOC}}{\text{MMBtu}}
\]
\[
0.0429 \frac{\text{lb VOC}}{\text{MMBtu}} \times \frac{(20.95 - 15)\%}{\text{O}_2} \times \frac{1 \text{ MMBtu}}{9,100 \text{ ft}^3} \times \frac{1 \text{ lb - mole}}{16 \text{ lb VOC}} \times \frac{10^6 \text{ ppmv}}{1} = 32 \text{ ppmv VOC \text{ @ 15} \% \text{ O}_2}
\]

C. Calculations

1. Pre-Project Potential to Emit (PE1)
Since the engines are new emissions units, PE1 = 0 for all affected pollutants.

2. Post Project Potential to Emit (PE2)

Daily PE2 for Each Engine during the Commissioning Period:

Daily emissions during the commissioning period for each of the proposed engines are calculated in the table below:

<table>
<thead>
<tr>
<th></th>
<th>NO(_x)</th>
<th>SO(_x)</th>
<th>PM(_{10})</th>
<th>CO</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.0</td>
<td>0.0492</td>
<td>0.07</td>
<td>8.0</td>
<td>0.414</td>
</tr>
<tr>
<td>(g/hp·hr)</td>
<td>x 841</td>
<td>(hp) x 24</td>
<td>(hp) x 24</td>
<td>(hp) x 24</td>
<td>(hp) x 24</td>
</tr>
<tr>
<td></td>
<td>(hr/day)</td>
<td>453.59 g/lb</td>
<td>453.59 g/lb</td>
<td>453.59 g/lb</td>
<td>453.59 g/lb</td>
</tr>
<tr>
<td></td>
<td>= 356.0</td>
<td>(lb/day)</td>
<td>2.2</td>
<td>3.1</td>
<td>18.4</td>
</tr>
</tbody>
</table>

Daily PE2 for Each Engine after Completion of the Commissioning Period:

Daily emissions each of the proposed engines after completion of the commissioning periods are calculated in the table below:
Maximum Annual PE for Each Engine Including the Commissioning Periods:

As discussed above, each of the proposed engines will be allowed to operate up to 200 hrs for commissioning during the first year of operation. Additionally, total NOX emissions for all of the proposed engines will be limited to 19,999 lb/yr and the total heat input for all of the proposed engines will be limited to 185,000 MMBtu/yr for all engines. The maximum annual PE for each engine and maximum total combined annual PE for all the engines will calculated based on maximum operation during the commissioning period and the applicable gas consumption limit.

**Maximum Annual PE2 for Each Engine Including the Commissioning Periods:**

**PE2 for Engines S-7767-1-0 thru -12-0 During the Commissioning Periods**

<table>
<thead>
<tr>
<th>NOX</th>
<th>NOX Worst Case</th>
<th>SOx</th>
<th>PM10</th>
<th>CO</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0</td>
<td>(g/hp·hr) x 841 (hp) x 200</td>
<td>(hr/yr) ÷ 453.59 (g/lb) = 2,967 lb/yr</td>
<td>18 lb/yr</td>
<td>26 lb/yr</td>
<td>154 lb/yr</td>
</tr>
</tbody>
</table>

**1st Year PE2 for Engines S-7767-1-0 thru -12-0 Excluding Commissioning**

<table>
<thead>
<tr>
<th>NOX</th>
<th>NOX Worst Case</th>
<th>SOx</th>
<th>PM10</th>
<th>CO</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15</td>
<td>(g/hp·hr) x 841 (hp) x 8,560</td>
<td>(hr/yr) ÷ 453.59 (g/lb) = 2,381 lb/yr</td>
<td>9,523 lb/yr</td>
<td>781 lb/yr</td>
<td>1,111 lb/yr</td>
</tr>
</tbody>
</table>

Maximum Annual PE2 from each of the proposed engines, Including Commissioning:

NOX: 2,967 lb-NOX/yr + 2,381 lb-NOX/yr = 5,348 lb-NOX/yr
NOX worst case: 2,967 lb-NOX/yr + 9,523 lb-NOX/yr = 12,490 lb-NOX/yr
SOx: 18 lb-SOx/yr + 781 lb-SOx/yr = 799 lb-SOx/yr
PM10: 26 lb-PM10/yr + 1,111 lb-PM10/yr = 1,137 lb-PM10/yr
CO: 2,967 lb-CO/yr + 27,774 lb-CO/yr = 30,741 lb-CO/yr
VOC: 154 lb-VOC/yr + 2,381 lb-VOC/yr = 2,535 lb-VOC/yr
Maximum Total Combined Annual PE2 from all of the proposed engines, Including Commissioning:

As discussed above, the total NO\textsubscript{x} emissions for all of the proposed engines will be limited by a Specific Limiting Condition (SLC) to 19,999 lb/yr and the total heat input for all of the proposed engines will be limited to 185,000 MMBtu/yr for all engines. This is approximately equal to 23,988,212 bhp-hr/yr (based on 33% efficiency). For worst-case calculations, it is assumed that 2,018,400 bhp-hr will be used for commissioning of the engines (12 engines x 841 bhp/engine x 200 hr), which leaves 21,969,812 bhp-hr for operation for the remainder of the year.

The maximum total combined annual PE2 for all the engines is calculated as follows:

NO\textsubscript{x}: total annual emissions limited by SLC to 19,999 lb-NO\textsubscript{x}/yr

SO\textsubscript{x}: 18 lb-SO\textsubscript{x}/yr-engine x 12 engines = 216 lb-SO\textsubscript{x}/yr

PM\textsubscript{10}: 26 lb-PM\textsubscript{10}/yr-engine x 12 engines = 312 lb-PM\textsubscript{10}/yr

CO: 2,967 lb-CO/yr-engine x 12 engines = 35,604 lb-CO/yr

VOC: 154 lb-VOC/yr-engine x 12 engines = 1,848 lb-VOC/yr

<table>
<thead>
<tr>
<th>NO\textsubscript{x}</th>
<th>SLC Limiting</th>
<th>Total NO\textsubscript{x} emissions to 19,999 lb/yr</th>
<th>19,999</th>
<th>(lb/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SO\textsubscript{x}</td>
<td>0.0492 (g/hp·hr) x 21,969,812</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 2,383 (lb/yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM\textsubscript{10}</td>
<td>0.07 (g/hp·hr) x 21,969,812</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 3,390 (lb/yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>1.75 (g/hp·hr) x 21,969,812</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 84,762 (lb/yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOC</td>
<td>0.15 (g/hp·hr) x 21,969,812</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 7,265 (lb/yr)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Maximum Total Combined Annual PE2 from all of the proposed engines, excluding commissioning:

NO\textsubscript{x}: total annual emissions limited by SLC to 19,999 lb-NO\textsubscript{x}/yr = 19,999 lb-NO\textsubscript{x}/yr

SO\textsubscript{x}: 216 lb-SO\textsubscript{x}/yr + 2,383 lb-SO\textsubscript{x}/yr = 2,599 lb-SO\textsubscript{x}/yr

PM\textsubscript{10}: 312 lb-PM\textsubscript{10}/yr + 3,390 lb-PM\textsubscript{10}/yr = 3,702 lb-PM\textsubscript{10}/yr

CO: 35,604 lb-CO/yr + 84,762 lb-CO/yr = 120,366 lb-CO/yr

VOC: 1,848 lb-VOC/yr + 7,265 lb-VOC/yr = 9,113 lb-VOC/yr

Maximum Total Combined Annual PE2 from all of the proposed engines after Commissioning:

For reference purposes, the maximum combined annual PE2 for all of the proposed engines are calculated in the following table

<table>
<thead>
<tr>
<th>NO\textsubscript{x}</th>
<th>SLC Limiting</th>
<th>Total NO\textsubscript{x} emissions to 19,999 lb/yr</th>
<th>19,999</th>
<th>(lb/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO\textsubscript{x}</td>
<td>0.15 (g/hp·hr) x 23,988,212</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 7,933 (lb/yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO\textsubscript{x}</td>
<td>0.60 (g/hp·hr) x 23,988,212</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 19,999 (lb/yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SO\textsubscript{x}</td>
<td>0.0492 (g/hp·hr) x 23,988,212</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 2,602 (lb/yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM\textsubscript{10}</td>
<td>0.07 (g/hp·hr) x 23,988,212</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 3,702 (lb/yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>1.75 (g/hp·hr) x 23,988,212</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 92,549 (lb/yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOC</td>
<td>0.15 (g/hp·hr) x 23,988,212</td>
<td>(bhp-hr/yr) / 453.59 (g/lb) = 7,933 (lb/yr)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Maximum Daily and Annual PE2 from Calculations Above:

The maximum daily and annual emissions for each pollutant calculated above from the commissioning period, the 1st year including the commissioning period, or normal operation are included in the table below.

<table>
<thead>
<tr>
<th></th>
<th>Max. Daily Emissions for each engine (lb/day)</th>
<th>Max. Annual Emissions for each engine (lb/year)</th>
<th>Max. Total Combined Annual Emissions for all engines (lb/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO(_X)</td>
<td>356.0</td>
<td>5,348</td>
<td>19,999</td>
</tr>
<tr>
<td>NO(_X) Worst Case</td>
<td>356.0</td>
<td>12,490</td>
<td>19,999</td>
</tr>
<tr>
<td>SO(_X)</td>
<td>2.2</td>
<td>799</td>
<td>2,602</td>
</tr>
<tr>
<td>PM(_{10})</td>
<td>3.1</td>
<td>1,137</td>
<td>3,702</td>
</tr>
<tr>
<td>CO</td>
<td>356.0</td>
<td>30,741</td>
<td>120,366</td>
</tr>
<tr>
<td>VOC</td>
<td>18.4</td>
<td>2,535</td>
<td>9,113</td>
</tr>
</tbody>
</table>

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

Pursuant to Section 4.9 of District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Since this is a new facility, there are no valid ATCs, PTOs, or ERCs at the Stationary Source; therefore, the SSPE1 will be equal to zero.

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

Pursuant to Section 4.10 of District Rule 2201, the Post Project Stationary Source Potential to Emit (SSPE2) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.
Post Project Stationary Source Potential to Emit [SSPE2] (lb/year)

<table>
<thead>
<tr>
<th>Permit Unit</th>
<th>NOx</th>
<th>SOx</th>
<th>PM10</th>
<th>CO</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>*ATC S-7767-5-0 (841 bhp Digester Gas Engine)</td>
<td>12,490</td>
<td>799</td>
<td>1,137</td>
<td>30,741</td>
<td>2,535</td>
</tr>
<tr>
<td>*ATC S-7767-6-0 (841 bhp Digester Gas Engine)</td>
<td>12,490</td>
<td>799</td>
<td>1,137</td>
<td>30,741</td>
<td>2,535</td>
</tr>
<tr>
<td>*ATC S-7767-7-0 (841 bhp Digester Gas Engine)</td>
<td>12,490</td>
<td>799</td>
<td>1,137</td>
<td>30,741</td>
<td>2,535</td>
</tr>
<tr>
<td>*ATC S-7767-8-0 (841 bhp Digester Gas Engine)</td>
<td>12,490</td>
<td>799</td>
<td>1,137</td>
<td>30,741</td>
<td>2,535</td>
</tr>
<tr>
<td>*ATC S-7767-9-0 (841 bhp Digester Gas Engine)</td>
<td>12,490</td>
<td>799</td>
<td>1,137</td>
<td>30,741</td>
<td>2,535</td>
</tr>
<tr>
<td>*ATC S-7767-10-0 (841 bhp Digester Gas Engine)</td>
<td>12,490</td>
<td>799</td>
<td>1,137</td>
<td>30,741</td>
<td>2,535</td>
</tr>
<tr>
<td>*ATC S-7767-11-0 (841 bhp Digester Gas Engine)</td>
<td>12,490</td>
<td>799</td>
<td>1,137</td>
<td>30,741</td>
<td>2,535</td>
</tr>
<tr>
<td>*ATC S-7767-12-0 (841 bhp Digester Gas Engine)</td>
<td>12,490</td>
<td>799</td>
<td>1,137</td>
<td>30,741</td>
<td>2,535</td>
</tr>
<tr>
<td>Post Project SSPE (SSPE2)*</td>
<td>19,999</td>
<td>2,602</td>
<td>3,702</td>
<td>120,366</td>
<td>9,113</td>
</tr>
</tbody>
</table>

*Total Combine Emissions from the Proposed Engines are limited by permit condition for NOx and total fuel input for all other pollutants

5. Major Source Determination

Pursuant to Section 3.24 of District Rule 2201, a Major Source is a stationary source with post-project emissions or a Post Project Stationary Source Potential to Emit (SSPE2), equal to or exceeding one or more of the following threshold values. However, Section 3.24.2 states, “for the purposes of determining major source status, the SSPE2 shall not include 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.”

6. Baseline Emissions (BE)

The BE calculation (in lbs/year) is performed pollutant-by-pollutant for each unit within the project, to calculate the QNEC and if applicable, to determine the amount of offsets required.
Pursuant to Section 3.7 of District Rule 2201, BE = Pre-project Potential to Emit for:

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

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to Section 3.22 of District Rule 2201.

As shown in Section VII.C.5 above, the facility is not a Major Source for any pollutant.

Therefore Baseline Emissions (BE) are equal to the Pre-Project Potential to Emit (PE1).

ATCs S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0:
Since these are new emissions units, BE = PE1 = 0 for all pollutants from each unit.

7. SB 288 Major Modification

An SB 288 Major Modification is modification as defined in 40 CFR Part 51.165, as in effect on December 19, 2002. 40 CFR Part 51.165 defines a major modification "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."

As discussed in Section VII.C.5 above, the facility is not a Major Source for any pollutant; therefore, the project does not constitute an SB 288 Major Modification.

8. Federal Major Modification

As discussed in Section VII.C.5 above, the facility is not a Major Source for any pollutant; therefore, the project does not constitute a Federal Major Modification and no further discussion is required.

9. Quarterly Net Emissions Change (QNEC)

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

841 bhp Digester Gas-Fired Rich Burn (Virtual Lean Burn) IC Engine (ATCs S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0)

As discussed in Section I of this evaluation, the applicant is proposing to install 12 new 841 bhp digester gas-fired IC engines with a PE that exceeds 2.0 lb/day for NOx, SOx, PM10, CO, and VOC. Therefore, BACT is triggered for NOx, SOx, PM10, and VOC. The PE for CO from each of the unit also exceeds 2.0 lb/day; however, BACT is not triggered for CO since the SSPE2 for CO is not greater than 200,000 lbs/year, as shown in Section VII.C.5 of this document.

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

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

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 for modification of an emissions unit.
d. Major Modification

As discussed in Section VII.C.7 above, this project does not constitute an SB 288 Major Modification or a Federal Major Modification; therefore BACT is not triggered for SB 288 Major Modification or Federal Major Modification purposes.

2. BACT Guideline

Proposed Digester Gas-Fired IC Engine (S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0)

There is currently no BACT Guideline that applies to IC engines fired on dairy digester gas. The most similar BACT Guideline that was contained in the District’s BACT Clearinghouse was BACT Guideline 3.3.13 [Waste Gas-Fired IC Engine], which applied to biogas-fired IC engines at wastewater treatment plants and landfills; however, this BACT guideline was rescinded prior to the application for this project being deemed complete; therefore, a new BACT analysis is required. The Top-Down BACT Analysis for the proposed units can be found in Appendix A of this application evaluation.

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 (District Rule 2201). The following BACT requirements resulted from the Top-Down BACT analyses performed for this project:

Digester Gas-Fired IC Engines (ATCs S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0)

Pursuant to the attached Top-Down BACT Analysis (see Appendix A), BACT for the Digester Gas-fired Engines is satisfied with the following:

**NOX:**
1) NOX emissions no greater than 0.6 g/bhp-hr (Achieved in Practice) &
2) Applying controls to reduce NOX emissions to ≤ 0.15 g/bhp-hr (9-11 ppmv @ 15% O2) (Technologically Feasible – Non-Selective Catalytic Reduction (NSCR) for rich burn engines or equivalent)

**SOX:** Sulfur Content not exceeding 50 ppmv H2S (Achieved in Practice)

**PM10:** Sulfur Content not exceeding 50 ppmv H2S (Achieved in Practice)

**VOC:** VOC Emissions not exceeding 0.20 g/bhp-hr (Achieved in Practice)

The applicant has proposed digester gas-fired rich burn IC engines with NOX emissions no greater than 0.60 g/bhp-hr and has proposed to install NSCR on the engines to attempt to reduce NOX emissions to no greater than 0.15 g/bhp-hr. The applicant has also proposed VOC emissions from the engines of 0.15 g/bhp/hr and to use a sulfur scrubber to reduce the sulfur content of the digester gas to 50 ppmv H2S or less. Therefore, the BACT requirements will be satisfied.
B. Offsets

1. Offset Applicability

Pursuant to Section 4.5.3, offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the Post Project Stationary Source Potential to Emit (SSPE2) equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The following table compares the post-project facility-wide annual emissions in order to determine if offsets will be required for this project.

<table>
<thead>
<tr>
<th>Offset Determination (lb/year)</th>
<th>NO\textsubscript{X}</th>
<th>SO\textsubscript{X}</th>
<th>PM\textsubscript{10}</th>
<th>CO</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Project SSPE (SSPE2)</td>
<td>19,999</td>
<td>2,602</td>
<td>3,702</td>
<td>120,366</td>
<td>9,113</td>
</tr>
<tr>
<td>Offset Threshold</td>
<td>20,000</td>
<td>54,750</td>
<td>29,200</td>
<td>200,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Offsets triggered?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

2. Quantity of Offsets Required

As seen above, the SSPE2 is not greater than the offset thresholds for any pollutant; therefore offset calculations are not necessary and offsets will not be required for this project.

C. Public Notification

1. Applicability

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

a. New Major Source

New Major Sources are new facilities, which are also Major Sources. As shown in Section VII.C.5 above, the SSPE2 is not greater than the Major Source threshold for any pollutant. Therefore, public noticing is not required for this project for new Major Source purposes.

b. Major Modification

As demonstrated in VII.C.7, this project does not constitute an SB 288 Major Modification or a Federal Major Modification; therefore, public noticing for Major Modification purposes is not required.
c. PE > 100 lb/day

Applications which include a new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. The PE2 for the proposed identical new units is compared to the daily PE Public Notice thresholds in the following table:

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>PE2 (lb/day)</th>
<th>Public Notice Threshold</th>
<th>Public Notice Triggered?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOX</td>
<td>356.0</td>
<td>100 lb/day</td>
<td>Yes</td>
</tr>
<tr>
<td>SOX</td>
<td>2.2</td>
<td>100 lb/day</td>
<td>No</td>
</tr>
<tr>
<td>PM10</td>
<td>3.1</td>
<td>100 lb/day</td>
<td>No</td>
</tr>
<tr>
<td>CO</td>
<td>356.0</td>
<td>100 lb/day</td>
<td>Yes</td>
</tr>
<tr>
<td>VOC</td>
<td>18.4</td>
<td>100 lb/day</td>
<td>No</td>
</tr>
</tbody>
</table>

Therefore, public noticing for PE > 100 lb/day purposes is required.

d. Offset Threshold

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

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>SSPE1 (lb/year)</th>
<th>SSPE2 (lb/year)</th>
<th>Offset Threshold</th>
<th>Public Notice Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOX</td>
<td>0</td>
<td>19,999</td>
<td>20,000 lb/year</td>
<td>No</td>
</tr>
<tr>
<td>SOX</td>
<td>0</td>
<td>2,602</td>
<td>54,750 lb/year</td>
<td>No</td>
</tr>
<tr>
<td>PM10</td>
<td>0</td>
<td>3,702</td>
<td>29,200 lb/year</td>
<td>No</td>
</tr>
<tr>
<td>CO</td>
<td>0</td>
<td>120,366</td>
<td>200,000 lb/year</td>
<td>No</td>
</tr>
<tr>
<td>VOC</td>
<td>0</td>
<td>9,113</td>
<td>20,000 lb/year</td>
<td>No</td>
</tr>
</tbody>
</table>

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

e. 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, Sections 4.9 and 4.10, respectively. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table:
2. Public Notice Action

As discussed above, public noticing is required for this project for NO\textsubscript{x} and CO emissions in excess of 100 lb/day and for an SSIPE for CO that exceeds 20,000 lbs/yr. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATC for this equipment.

D. Daily Emission Limits (DELS)

Daily Emissions Limitations (DELS) and other enforceable conditions are required by Section 3.15 to restrict a unit’s maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. Per Sections 3.15.1 and 3.15.2, the DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

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

Proposed Rule 2201 (DEL) Conditions for Engines during Both Commissioning and Normal Operation:

- This engine shall be fired only on digester gas. [District Rule 2201]
- The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H\textsubscript{2}S. [District Rules 2201 and 4801]
- The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201].
- The total combined NO\textsubscript{x} (as NO\textsubscript{2}) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the
12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]

Proposed Rule 2201 (DEL) Conditions during Commissioning Period:

For these digester gas-fired IC engines, the DELs for NOx, PM10, CO, and VOC are stated in the form of maximum emission factors (g/bhp-hr) and maximum number of hours allowed for commissioning activities.

- Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

- No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

- Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

- The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

Proposed Rule 2201 (DEL) Conditions during Normal Operation:

For these digester gas-fired IC engines, the DELs for NOx, PM10, CO, and VOC during normal operation are stated in the form of emission factors (g/hp-hr & ppmv), the maximum
engine horsepower rating (841 bhp), and the maximum operational time of 24 hours per day.

- Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

- The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

- If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

E. Compliance Assurance

1. Source Testing

The proposed 841 bhp digester gas-fired engines are subject to District Rule 4702 - Internal Combustion Engines – Phase 2. Section 6.3.2.1 of District Rule 4702 requires source testing of NOx, CO, and emissions at least once every 24 months for a non-agricultural spark-ignited IC engine. The proposed engine is also subject to 40 CFR 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. 40 CFR 60, Subpart JJJJ requires uncertified engines rated 500 bhp or more to be source tested every 8,760 hours of operation or every 3 years, whatever comes first. The periodic source testing required by District Rule 4702 and 40 CFR 60, Subpart JJJJ will ensure compliance with the applicable New Source Review (NSR) requirements of District Rule 2201. Therefore, source testing for NOx, CO, and VOC will be required within 365 days of initial operation and at least once every 8,760 hours of operation or 24 months thereafter, whichever comes first.

The following conditions will be placed on the permits to ensure compliance:

- For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]
• Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

• {3791} 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 official 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. VOC emissions shall be reported as both methane and propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

• The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

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

• The 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]

2. Monitoring

As stated above the engine is subject to District Rule 4702. Section 5.6.1 of District Rule 4702 requires engines equipped with external control devices to install, operate, and maintain an APCO-approved alternate monitoring plan. Section 5.6.9 of District Rule 4702 requires monitoring of NOX emissions at least once every calendar quarter for a non-agricultural spark-ignited IC engine. However, Section 6.5.3 of District Rule 4702 requires monthly monitoring for engines equipped with non-certified control devices in order to demonstrate compliance with the emission limits in District Rule 4702. Additionally, considering the more stringent NSR emission limits required in the proposed ATC, the size of the engine, the potential variability of the digester gas fuel, and the fact that catalytic controls do not yet have an adequately established track record on digester gas-fired units, monthly monitoring gives greater assurance of compliance with the NSR emission limits in the proposed ATC. Therefore, monthly monitoring of NOX, CO, and O2 concentrations in accordance pre-approved alternate monitoring plan “A” will be required. The following conditions will be placed on the permits to ensure compliance:

• The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable
emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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 either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

- (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]

Because the engine will be fueled on digester gas, which can have a variable composition, the sulfur content of the digester fuel must be tested on an ongoing basis to ensure that the emission limit for SOx and the annual fuel input heating values are met. Therefore, the following conditions will be placed on the permits to ensure compliance:

- The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may
return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel 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 H2S monitors; gas detection tubes calibrated for H2S; District-approved source test methods, including 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]

- The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

3. Recordkeeping

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

- The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

- The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

- The permittee shall maintain records of: (1) the date and time of NOx, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NOx and CO concentrations corrected to 15% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 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: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or
volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

- For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

- The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

- Records of biogas analyzer(s) installed to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

- All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

4. Reporting

As stated above, the proposed 841 bhp digester gas-fired engines are subject to 40 CFR 60, Subpart JJJJ. 40 CFR 60, Subpart JJJJ requires uncertified engines rated 500 bhp or more to submit an initial notification to EPA. 40 CFR 60, Subpart JJJJ and District Rule 4702 also require the operator or owner of the engine to report source test results within 60 day of the completion of testing. Additionally, if NOx emissions from the digester gas-fired engine with an NSCR system are found to exceed 0.15 g/bhp-hr after the BACT determination period, the applicant will be required to submit a report containing relevant monitoring data and detailing the steps taken to reduce emissions.

Therefore, the following conditions will be listed on the permit:

- If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when
determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

- 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 JJJJJ]

- 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJJ]

F. Ambient Air Quality Analysis (AAQA)

Section 4.14.1 of District Rule 2201 requires that an ambient air quality analysis (AAQA) be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The Technical Services Division of the SJVAPCD conducted the required analysis. The analysis for the project was conducted under a worst-case operating scenario of four engines undergoing commissioning, and the remaining eight engines operating normally. Refer to Appendix B of this document for the AAQA summary sheet. The results of the Criteria Pollutant Modeling conducted for the AAQA are summarized in the following table:

<table>
<thead>
<tr>
<th>Criteria Pollutant Modeling Results*</th>
<th>Digester Gas-Fired ICES</th>
<th>1 Hour</th>
<th>3 Hours</th>
<th>8 Hours</th>
<th>24 Hours</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Pass</td>
<td></td>
<td></td>
<td>Pass</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>NOx</td>
<td>Pass*</td>
<td>X</td>
<td></td>
<td>X</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>SOx</td>
<td>Pass</td>
<td></td>
<td></td>
<td>X</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>PM10</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Pass¹</td>
<td>Pass¹</td>
</tr>
</tbody>
</table>

*Results were taken from the PSD spreadsheet.

¹The criteria pollutants are below EPA’s level of significance as found in 40 CFR Part 51.165 (b)(2).

The NOx 1-hour standard was passed using the Plume Volume Molar Ratio Method and the District-developed Tier IV (Draft) method for modeling the EPA NO2 standard.

As shown by the AAQA summary, the proposed equipment will not cause a violation of an ambient air quality standard for NOx, SOx, PM10, or CO.

Rule 2520 Federally Mandated Operating Permits

Since this facility’s potential emissions do not exceed any major source thresholds of Rule 2201, this facility is not a major source, and Rule 2520 does not apply.
Rule 4101 Visible Emissions

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

Since the IC engines are fired solely on gaseous fuel, visible emissions are not expected to exceed Ringelmann 1 or 20% opacity as long as the equipment is properly maintained and operated. Therefore, the following condition will be listed on the proposed ATC permits to ensure compliance:

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

Rule 4102 Nuisance

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

California Health & Safety Code 41700 (Health Risk Assessment)

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

An HRA is not required for a project with a total facility prioritization score of less than or equal to one. According to the Technical Services Memo for this project (Appendix 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 results of the health risk assessment are summarized in the table below.

<table>
<thead>
<tr>
<th>Categories</th>
<th>841 bhp Digester Gas-Fired IC Engines (S-7767-1-0 thru -12-0)</th>
<th>Project Totals</th>
<th>Facility Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prioritization Score</td>
<td>0.0792</td>
<td>0.95</td>
<td>0.95</td>
</tr>
<tr>
<td>Acute Hazard Index</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Chronic Hazard Index</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Maximum Individual Cancer Risk (10^-6)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>T-BACT Required?</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Permit Conditions?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion of T-BACT

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

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification not have acute or chronic indices, or a cancer risk greater than the District's significance levels (i.e. acute and/or chronic indices greater than 1 and a cancer risk greater than 10 in a million). As outlined by the HRA Summary in Appendix B of this report, the emissions increases for this project was determined to be less than significant. The following condition will be placed on the permit to ensure compliance with the assumptions of the HRA:

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

Rule 4201 Particulate Matter Concentration

The purpose of this rule is to protect the ambient air quality by establishing a particulate matter emission standard. Section 3.1 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot.

\[
0.07 \frac{g}{hp\cdot hr} \times \frac{1 hp \cdot hr}{2,545 Btu} \times \frac{10^6 Btu}{9,100 dscf} \times \frac{0.33 Btu_{in}}{1 Btu_{in}} \times \frac{15.43 grain}{g} = 0.015 \frac{grain}{dscf}
\]

Since 0.015 grain/dscf is less than 0.1 grain/dscf, compliance with this rule is expected. The following condition will be listed on the proposed ATC permits to ensure compliance:

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

Rule 4701 Internal Combustion Engines – Phase 1

The purpose of this rule is to limit the emissions of nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion engines. Except as provided in Section 4.0, the provisions of this rule apply to any internal combustion engine rated greater than 50 bhp that requires a Permit to Operate (PTO). However, the proposed engines are subject to District Rule 4702, Internal Combustion Engines – Phase 2. Pursuant to Section 7.6 of District Rule 4702, an engine that is subject to the requirements of District Rule 4702 is exempt from District Rule 4701; therefore, the engines are exempt from the requirements of this rule. Although the engines are exempt from District Rule 4701, the engines will be subject to the more stringent emission limits of District Rules 2201 and 4702.
Rule 4702  Internal Combustion Engines – Phase 2

The purpose of this rule is to limit the emissions of nitrogen oxides (NO\textsubscript{x}), carbon monoxide (CO), and volatile organic compounds (VOC) from spark-ignited internal combustion engines.

This rule applies to any spark-ignited internal combustion engine with a rated brake horsepower greater than 50 horsepower.

Section 5.1 requires that the owner of an internal combustion engine shall not operate it in such a manner that results in emissions exceeding the limits in the Engine Emission Limits table below for the appropriate engine type, according to the compliance schedule listed in Section 7.0. An engine shall be restricted by permit condition to emissions limits, in ppmv (corrected to 15% oxygen on a dry basis), that meet or exceed the following applicable emission limits pursuant to Section 5.1 or Section 8.2.

<table>
<thead>
<tr>
<th>Engine Type</th>
<th>NO\textsubscript{x} Emission Limit (ppmv @ 15% O\textsubscript{2}, dry)</th>
<th>CO Emission Limit (ppmv @ 15% O\textsubscript{2}, dry)</th>
<th>VOC Emission Limit (ppmv @ 15% O\textsubscript{2}, dry)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. a. Rich Burn, Waste Gas Fueled</td>
<td>50 ppmv or 90% reduction</td>
<td>2,000 ppmv</td>
<td>250 ppmv</td>
</tr>
<tr>
<td>1. b. Rich Burn, Cyclic Loaded, Field Gas Fueled</td>
<td>50 ppmv</td>
<td>2,000 ppmv</td>
<td>250 ppmv</td>
</tr>
<tr>
<td>1. c. Rich Burn, All Other Engine</td>
<td>25 ppmv or 96% reduction</td>
<td>2,000 ppmv</td>
<td>250 ppmv</td>
</tr>
<tr>
<td>2. a. Lean Burn 2-Stroke, Gaseous Fueled, &lt; 100 hp</td>
<td>75 ppmv or 85% reduction</td>
<td>2,000 ppmv</td>
<td>750 ppmv</td>
</tr>
<tr>
<td>2. b. Lean Burn, All Other Engines</td>
<td>65 ppmv or 90% reduction</td>
<td>2,000 ppmv</td>
<td>750 ppmv</td>
</tr>
<tr>
<td>3. Rich-Burn Engine Used Exclusively in Agricultural Operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Comply by 1/1/2009, or if owner has an agreement to electrify, comply by 1/1/2010</td>
<td>90 ppmv or 80% reduction</td>
<td>2000 ppmv</td>
<td>250 ppmv</td>
</tr>
<tr>
<td>4. Lean-Burn Engine Used Exclusively in Agricultural Operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Comply by 1/1/2009 or if owner has an agreement to electrify, comply by 1/1/2010</td>
<td>150 ppmv or 70% reduction</td>
<td>2000 ppmv</td>
<td>750 ppmv</td>
</tr>
<tr>
<td>5. Certified Spark-Ignited Engine Used Exclusively in AO and installed on or before June 16, 2005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Comply by 6/1/2006</td>
<td>Meet Certified Spark-Ignited Engine Standard of HC+NO\textsubscript{x} &lt; 0.6 g/bhp-hr</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
These digester gas-fired engines will be operated as a separate stationary source than the dairy farm; therefore, the District has determined that the IC engines are non-agricultural IC engines. The rich burn, digester gas-fired, engines are waste gas-fired engines and are required to meet the following emissions limits: 50 ppmvd NO\textsubscript{x}, 2,000 ppmvd CO, and 250 ppmvd VOC (all measured @ 15% O\textsubscript{2}).

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

- Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NO\textsubscript{x}/bhp-hr (= 11 ppmvd NO\textsubscript{x} @ 15% O\textsubscript{2}; NO\textsubscript{x} referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O\textsubscript{2}), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O\textsubscript{2}), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

Section 5.2 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 proposed under this project will not have CEMS installed; therefore, this section of the Rule is not applicable.

Section 5.6 requires that the owner of a non-agricultural IC engine (excluding those engines subject to Section 4.2 or Section 4.3 unless otherwise specified) subject to the requirements of this rule meet the following requirements:

For each engine with a rated brake horsepower of 1,000 hp or greater and which is permitted to operate more than 2,000 hours per calendar year, or with an external emission control device, shall either install, operate, and maintain continuous monitoring equipment for NO\textsubscript{x}, 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:

- Periodic NO\textsubscript{x} and CO emission concentrations,
- Engine exhaust oxygen concentration,
- Air-to-fuel ratio,
- Flow rate of reducing agents added to engine exhaust,
- Catalyst inlet and exhaust temperature,
- Catalyst inlet and exhaust oxygen concentration,
- Other operational characteristics.

The applicant has chosen to meet this section of the Rule by proposing a pre-approved alternate emissions monitoring plan that specifies that the permittee perform periodic NO\textsubscript{x}, CO, and O\textsubscript{2} emissions concentrations as specified in District Policy SSP-1810, dated 4/29/04. Therefore, the following condition will be placed on the ATC permits:

- The permittee shall monitor and record the stack concentration of NO\textsubscript{x}, CO, and O\textsubscript{2} at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved]
in writing by the APCO.] 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 5.6.6 requires that for each non-agricultural IC engine, including an engine subject to Section 4.2, install and operate a non-resettable elapsed operating time meter. In lieu of installing a non-resettable 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. The owner or operator shall maintain the required meter in proper operating condition. The applicant has proposed a non-resettable elapsed operating time meter for the engines involved with this project. Therefore, the following condition will be placed on the ATC permits to ensure compliance:

- This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

Section 5.6.7 requires that for each engine, the permittee shall implement the Inspection and Monitoring (I&M) plan submitted to and approved by the APCO pursuant to Section 6.5. The applicant has submitted an I&M program with this ATC application and the requirements of this plan will be explained in detail in the section that covers Section 6.5 of this Rule.

Section 5.6.8 requires that for each engine, collect data through the I&M plan in a form approved by the APCO. The applicant has submitted an I&M program and the requirements of this plan will be explained in detail in the section that covers Section 6.5 of this Rule.

Section 5.6.9 requires that each non-agricultural IC engine, use a portable NOx analyzer to take NOx emission readings to verify compliance with the emission requirements of Section 5.1 or Section 8.2 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 NOx emissions readings shall be reported to the APCO in a manner approved by the APCO. NOx 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. Therefore, the following conditions will be placed on the ATC permits:

- The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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 6.1 requires that the owner of an engine subject to the requirements of this rule shall submit to the APCO an emission control plan of all actions to be taken to satisfy the emission requirements of Section 5.1 and the compliance schedules of Section 7.0. Such emission control plan shall contain a list with the following for each permitted engine:

- Permit-to-Operate number
- Engine manufacturer
- Model designation
- Rated brake horsepower
- Type of fuel and type of ignition
- Combustion type: rich-burn or lean-burn
- Total hours of operation in the previous one-year period, including typical daily operating schedule
- Fuel consumption (cubic feet for gas or gallons for liquid) for the previous one-year period
- Stack modifications to facilitate continuous in-stack monitoring and to facilitate source testing
- Type of control to be applied, including in-stack monitoring specifications
- Applicable emission limits
- Documentation showing existing emissions of NO\textsubscript{x}, VOC, and CO, and
- Date that the engine will be in full compliance with Rule 4702.

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.

The applicant has submitted all the required information for Section 6.1 in the application for the IC engines involved with this project.

Section 6.2 requires that except for engines subject to Section 4.0, 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 and quantity (cubic feet of gas or gallons of liquid) 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 placed on the ATC permits:

- The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

Section 6.2.2 requires that the data collected pursuant to the requirements of Section 5.6 shall be maintained for at least five years, shall be readily available, and made available to the APCO upon request.

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

- All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

Section 6.3 requires that the owner of an engine subject to the emission limits in Section 5.1 or the requirements of Section 8.2, shall:

Demonstrate compliance with applicable limits by the applicable date specified in Section 7.6 and at least once every 24 months thereafter, in accordance with the test methods in Section 6.4.

Conduct emissions source testing with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate. For emissions source testing performed pursuant to Section 6.3.1 for the purpose of determining compliance with an applicable standard or numerical limitation, the arithmetic average of three (3) 30-consecutive-minute test runs shall apply. If two (2) of three (3) runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC shall be reported as methane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15 percent oxygen. For engines that comply with a percent reduction limit in Table 1, the percent reduction of NOx emissions shall also be reported.

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.
Therefore, the following condition will appear on the ATC permits to ensure compliance:

- For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

- Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

- {3791} 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 official 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. VOC emissions shall be reported as both methane and propane. VOC, NOx, and CO 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 5.0 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 previously proposed condition will be listed on the proposed ATCs:

- The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

Section 6.5 requires that the owner of an engine subject to the emission limits in Section 5.1 or the requirements of Section 8.2, 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 5.6. The actions to be identified in the I&M plan shall include, but are not limited to, the following:

- 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 proposed that the alternate monitoring program will ensure compliance with Sections 6.5.1 and 6.5.2 of the Rule. Therefore, the following previously proposed condition will be listed on the proposed ATC permits to ensure compliance:

- The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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 owner or 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 owner or 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. Therefore, the following condition will be listed on the proposed ATC permits to ensure compliance:

- If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2) are not subject to the
requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [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 conditions will be listed on the proposed ATC permits:

- **{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]

- **{3203}** This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]

Section 6.5.7 specifies procedures and a schedule for using a portable NO\textsubscript{x} analyzer to take NO\textsubscript{x} emission readings pursuant to Section 5.6.9. The applicant has proposed that the alternate monitoring program will ensure compliance with this section of the Rule.

Therefore, the following previously proposed condition will be listed on the proposed ATC permits:

- **{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 5.6.1 and 5.6.2. 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. Therefore, the following previously proposed condition will be listed on the proposed ATC permits to ensure compliance:

- The permittee shall maintain records of: (1) the date and time of NO\textsubscript{x}, CO, and O2 measurements, (2) the O2 concentration in percent and the measured NO\textsubscript{x} and CO concentrations corrected to 15% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 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 owner 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. The owner of an engine may request a change to the I&M plan at any time. The applicant has proposed that they will modify the I&M plan per this section of the Rule.

Therefore, the following condition will be listed on the proposed ATC permits to ensure 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]

Conclusion

As shown above, the proposed non-agricultural, digester gas-fired, rich burn, IC engines will satisfy all the requirements of Rule 4702. Therefore, the engines will be in compliance as of the date of initial operation and no further discussion is required.

Rule 4801 – Sulfur Compounds

The purpose of this District Rule 4801 is to limit the emissions of sulfur compounds. The limit is that sulfur compound emissions (as SO₂) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

Volume of SOₓ as (SO₂) = \( \frac{n \times R \times T}{P} \)

Where:
- \( n \) = moles SOₓ
- \( T \) (standard temperature) = 60°F or 520°F
- \( R \) (universal gas constant) = \( \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot \text{°R}} \)

\[
0.0141 \times \frac{\text{lb}}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{9,100 \text{ scf}_{\text{exhaust}}} \times \frac{1 \text{ lb} \cdot \text{mol}}{64 \text{ lb} \cdot \text{SO}_2} \times \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot \text{°R}} \times \frac{520\text{°R}}{14.7 \text{ psi}} \times 1,000,000 \text{ ppm} = 9.2 \text{ ppmv}
\]

Since 9.2 ppmv is \( \leq 2000 \) ppmv, the engine is expected to comply with Rule 4801.

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

- The H₂S content of the digester gas used as a fuel in the engine shall not exceed 50 ppmv. [District Rules 2201 and 4801]
40 CFR 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

This rule incorporates the New Source Performance Standards (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.

The purpose of 40 CFR 60 Subpart JJJJ is to establish New Source Performance Standards to reduce emissions of NO\textsubscript{x}, SO\textsubscript{x}, PM, CO, and VOC from new stationary spark ignition (SI) internal combustion (IC) engines.

Pursuant to Section 60.4230, owners and operators of a stationary SI IC engine 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) that commence modification or reconstruction after June 12, 2006 must comply with the provisions of this subpart. The proposed engines are 841 bhp SI IC engines that will be constructed after June 12, 2006; therefore, the engines are subject to this subpart.

Pursuant to Section 60.4233(f)(5), owners and operators of a stationary landfill or digester gas-fired SI IC engine with a maximum engine power greater than or equal to 75 kW (100 bhp) that commence modification or reconstruction after June 12, 2006 must comply with the emission standards in 40 CFR 60, Subpart JJJJ, Table 1 for their stationary SI IC engine. The proposed engines are 841 bhp SI IC engines that will be constructed after June 12, 2006; therefore, the engines are subject to the emission standards in Table 1 of this subpart.

The requirements contained in 40 CFR 60, Subpart JJJJ, Table 1 for landfill and digester gas-fired engines are summarized in the table below:

<table>
<thead>
<tr>
<th>Engine Type and Fuel</th>
<th>Maximum Engine Power</th>
<th>Manufacture Date</th>
<th>Emission Standards\textsuperscript{a}</th>
<th>Emission Standards\textsuperscript{b}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>g/HP-hr</td>
<td>ppmvd at 15% O\textsubscript{2}</td>
</tr>
<tr>
<td>Landfill/Digester Gas (except lean burn 500 ≥ bhp &lt; 1,350)</td>
<td>bhp &lt; 500</td>
<td>7/1/2008</td>
<td>3.0</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>bhp ≥ 500</td>
<td>7/1/2008</td>
<td>3.0</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/1/2011</td>
<td>2.0</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7/1/2007</td>
<td>3.0</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7/1/2010</td>
<td>2.0</td>
<td>150</td>
</tr>
<tr>
<td>Landfill/Digester Gas Lean Burn</td>
<td>500 ≥ bhp &lt; 1,350</td>
<td>1/1/2008</td>
<td>3.0</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7/1/2010</td>
<td>2.0</td>
<td>150</td>
</tr>
</tbody>
</table>
\textsuperscript{a} Owners and operators of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15 percent O\textsubscript{2}.

\textsuperscript{b} VOC emission concentrations reported as propane; For purposes of this subpart, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.

The proposed engines will satisfy the applicable standards of this subpart and the following previously proposed condition will ensure compliance:

- Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NO\textsubscript{x}/bhp-hr (= 11 ppmvd NO\textsubscript{x} @ 15% O\textsubscript{2}; NO\textsubscript{x} referenced as NO\textsubscript{2}), 1.75 g-CO/bhp-hr
Pursuant to Section 60.4234, an owner or operator of a stationary SI internal combustion engine must operate and maintain the engines such that they achieve the emission standards as required in 40 CFR 60.4233 over the entire life of the engine.

District Rule 4702 and the ATC permits for the proposed engines require adequate periodic monitoring to ensure that the applicable emission limits contained in the permit are met. Therefore, the requirements of this section will be satisfied.

Pursuant to Section 60.4243, an owner or operator of a non-certified stationary SI internal combustion engine rated greater than 500 bhp must keep a maintenance plan and records of conducted maintenance. Additionally an initial performance source test must be conducted and subsequent performance tests must be conducted every 8,760 hours or 3-years, whichever comes first. The operator of the proposed engines is also required to maintain records of maintenance and periodically source test to demonstrate compliance with District Rule 4702; therefore, the following previously listed conditions 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: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

- For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

- Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

Pursuant to Section 60.4243(g) air-to-fuel ratio controllers used with the operation of three-way catalysts/non-selective catalytic reduction 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 placed on 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 requires that three separate test runs be conducted for each performance test and that each test run must be conducted within 10 percent of 100 percent peak (or the
highest achievable) load and last at least 1 hour. The following previously proposed condition will be placed on the permits to ensure compliance:

- For official 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. VOC emissions shall be reported as both methane and propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

Section 60.4245(c) requires owners and operators of stationary SI ICE greater than or equal to 500 bhp that have not been certified by an engine manufacturer to meet the emission standards in Section 60.4231 to submit an initial notification as required in Section 60.7(a)(1). The notification must include the following:

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 ATC permits 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

Section 60.4245(d) requires owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in §60.4244 within 60 days after the test has been completed. The following previously proposed condition will be placed on the permits 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]

Table 2 of 40 CFR 60, Subpart JJJJ specifies methods and procedures for performance testing to demonstrate compliance with the applicable emission limits. The following previously proposed condition will be placed on the permits to ensure compliance:

- The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]
40 CFR 63 Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Internal Combustion Engines

40 CFR 63 Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAPs) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. A major source of HAP emissions is a facility that has the potential to emit any single HAP at a rate of 10 tons/year or greater or any combinations of HAPs at a rate of 25 tons/year or greater. An area source of HAPs is a facility is not a major source of HAPs.

As discussed above, the proposed digester gas power plant will be located at an existing dairy operation; however, the applicant has provided information demonstrating that the digester gas power plant will be owned and operated separately from the dairy. Therefore, the existing dairy and the proposed digester gas-fired IC engines will not be under common control and the dairy and digester gas power plant will be treated as separate stationary sources when determining if the proposed digester gas-fired IC engines will constitute a major source of HAP emissions.

The total HAP emissions for the new digester gas power plant were calculated based on toxic emission factors provided by the Technical Services Division of the SJVAPCD for combustion of digester gas in IC engines (see Appendix C). The total HAP emissions from this new facility are less than the Major HAP source thresholds; therefore, this facility is an Area Source as defined in this subpart. Pursuant to Section 63.6590(c), an affected source that is a new or reconstructed stationary Reciprocating Internal Combustion Engine (RICE) located at an area source must meet the requirements of 40 CFR 63, Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII, for compression ignition engines or 40 CFR 60, Subpart JJJJ, for spark ignition engines and no further requirements apply for such engines under this part. As shown above, the proposed spark-ignited engines will comply with 40 CFR 60, Subpart JJJJ; therefore, the engines are expected to comply with this 40 CFR 63, Subpart ZZZZ.

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.

Greenhouse Gas (GHG) Significance Determination

It is determined that no other agency has or will prepare an environmental review document for the project. Thus, the District is the Lead Agency for this project. The proposed project is for construction of a renewable energy plant at an existing dairy facility. The proposed renewable energy plant will combust dairy digester gas in I.C. engines to produce electricity. The proposed project will require covering existing lagoons at the dairy to capture much of the methane that is currently released into the atmosphere from the open lagoons at the dairy. Combustion of the dairy digester gas at the proposed renewable energy plant will oxidize the methane in the gas to carbon dioxide and water vapor. Because methane has a global warming potential at least 21 times that of carbon dioxide, combustion of the methane from the dairy lagoons will result in a large net decrease in the global warming potential emitted from the dairy when compared to current levels. Therefore, the District has determined that the project would not result in an increase in project specific greenhouse gas emissions. The District therefore concludes that the project would have a less than cumulatively significant impact on global climate change.

District CEQA Findings

The District is the Lead Agency for this project because there is no other agency with broader statutory authority over this project. The District performed an Engineering Evaluation (this document) for the proposed project and determined that the activity will occur at an existing facility and the project involves negligible expansion of the existing use. Furthermore, the District determined that the activity will not have a significant effect on the environment. The District finds that the activity is categorically exempt from the provisions of CEQA pursuant to CEQA Guideline § 15031 (Existing Facilities), and finds that the project is exempt per the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment (CEQA Guidelines §15061(b)(3)).

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Issue Authority to Construct permits S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0 subject to the permit conditions on the attached draft Authority to Construct in Appendix D.
X. Billing Information

<table>
<thead>
<tr>
<th>Permit Number</th>
<th>Fee Schedule</th>
<th>Fee Description</th>
<th>Annual Fee</th>
</tr>
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<td>3020-10-E</td>
<td>841 bhp IC engine</td>
<td>$602.00</td>
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<td>S-7767-12-0</td>
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<td>841 bhp IC engine</td>
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Appendices

A: BACT Analysis for the Proposed Digester Gas-Fired IC Engines
B: Summary of Health Risk Assessment (HRA) and Ambient Air Quality Analysis (AAQA)
C: Total Toxic and Hazardous Air Pollutant (HAP) Emissions from the Proposed IC Engines
D: Draft ATCs (S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0)
APPENDIX A

Project Specific BACT Analysis for Digester Gas-Fired IC Engines
**Draft BACT Guideline**

Project-Specific Best Available Control Technology (BACT) Guideline

Last Update: October 2009

Emissions Unit: Agricultural Biogas Gas-Fired IC Engine

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Achieved in Practice or contained in SIP</th>
<th>Technologically Feasible</th>
<th>Alternate Basic Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>300 ppmvd @ 15% O&lt;sub&gt;2&lt;/sub&gt;, 2.5 g/bhp-hr, or 7.8 lb/MW-hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO&lt;sub&gt;x&lt;/sub&gt;</td>
<td>50 ppmvd @ 15% O&lt;sub&gt;2&lt;/sub&gt;, 0.6 g/bhp-hr, or 1.9 lb/MW-hr</td>
<td>0.15 g/bhp-hr (lean-burn engine with SCR or Noxtech, rich-burn engine with 3-way catalyst, or other equivalent)</td>
<td>1. Fuel Cells (&lt;0.05 lb/MW-hr ≈ 1.5 ppmv @ 15% O&lt;sub&gt;2&lt;/sub&gt;) (Not cost effective without grants) 2. Microturbines (&lt;9 ppmv @ 15% O&lt;sub&gt;2&lt;/sub&gt;) 3. Gas Turbine (&lt;9 ppmv @ 15% O&lt;sub&gt;2&lt;/sub&gt;) (Note: large gas turbines only ABE for projects ≥ 3 MW)</td>
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<tr>
<td>PM&lt;sub&gt;10&lt;/sub&gt;</td>
<td>Scrubbing of the of the digester gas such that the sulfur content does not exceed 50 ppmv H&lt;sub&gt;2&lt;/sub&gt;S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SO&lt;sub&gt;x&lt;/sub&gt;</td>
<td>Scrubbing of the of the digester gas such that the sulfur content does not exceed 50 ppmv H&lt;sub&gt;2&lt;/sub&gt;S</td>
<td>1. 99% control (Dry absorption of H&lt;sub&gt;2&lt;/sub&gt;S from the fuel gas) 2. 90% control (Wet absorption of H&lt;sub&gt;2&lt;/sub&gt;S from the fuel gas)</td>
<td></td>
</tr>
<tr>
<td>VOC</td>
<td>0.20 g/bhp-hr (lean burn or equivalent and either positive crankcase ventilation (PCV) or a 90% efficient crankcase control device)</td>
<td></td>
<td>Fuel Cells (&lt;0.02 lb/MW-hr ≈ 2.0 ppmv @ 15% O&lt;sub&gt;2&lt;/sub&gt; as CH&lt;sub&gt;4&lt;/sub&gt;)</td>
</tr>
</tbody>
</table>
BACT Analysis
Project-Specific BACT Analysis for Proposed Agricultural Digester Gas-Fired Engines

I. Purpose of the Project-Specific BACT Analysis

The proposed dairy digester gas-fired engines are subject to the BACT requirements of District Rule 2201. The District BACT Guidelines do not contain a BACT Guideline that applies to this specific category of source. The most similar District BACT Guideline was rescinded BACT Guideline 3.3.13 (last updated 10/1/2002), which generally applied to waste gas-fired IC engines at wastewater treatment plants and landfills. A significant difference between agricultural biogas and the other types of waste gas that were covered in the rescinded BACT Guideline 3.3.13 is that agricultural biogas does not contain siloxanes, which result from the decomposition of silicon compounds generally found in human cosmetics, personal care products, detergents, pharmaceuticals, lubricants, adhesives, and plastics products. When siloxanes are combusted and then cool in the exhaust, they create a silicate powder or glass-like coating that covers and deactivates catalysts and causes damage to downstream equipment. Because of the presence of siloxanes it was previously determined that the use of most add-on emission control options was infeasible for waste gas-fired engines. However, this determination is not applicable for agricultural biogas, which does not contain siloxanes. Additionally, systems have now been developed and demonstrated that can remove siloxanes from waste gases; therefore, even for non-agricultural biogas, the cost of these systems must be evaluated prior to ruling out add-on control options. Because further reductions in NOx emission are critical for the District’s ability to reach attainment of health-based air quality standards for ozone and particulate matter, in accordance with District Rule 2201, the District will identify and evaluate potential add-on controls and alternative equipment with reduced NOx emissions and perform a project-specific BACT analysis for the proposed project.

Based on review of the available technical information and contacts with catalyst suppliers, the District has determined that catalytic controls are a technologically feasible control IC engines fired on agricultural biogas. Therefore, this option will be evaluated for the project. Additionally, information from multiple sources indicates that new alternative technologies (such as fuel cells and microturbines) have been utilized at a number of facilities to produce electricity from various types of biogas. These newer technologies have significantly lower NOx emissions than uncontrolled reciprocating IC engines. Therefore, these technologies will also be included in the project-specific BACT analysis as alternate basic equipment. The project-specific BACT analysis for the proposed agricultural biogas-fired engine will identify catalytic controls as technologically feasible and will also list the alternate equipment options that are evaluated below.

II. Proposal and Process Description

ABEC Bidart-Old River, LLC a subsidiary of California Bioenergy, LLC has requested Authority to Construct (ATC) permits to install 12 new 841 bhp digester gas-fired IC engines at Bidart Dairy, LLC (Facility S-4751). Each engine will be equipped with a non-selective catalytic
reduction (NSCR) system for emissions control and will power a 600 kW electrical generator. Digester gas, which consists mostly of methane, the main component of natural gas, will be combusted in the IC engines to produce power. Hydrogen Sulfide (H2S) in the digester gas will be removed using an iron sponge dry scrubber or an equivalent H2S removal system and the gas will then be sent to the IC engines via plastic piping. The engines will power electrical generators that will produce power to be sold to the utility. The engines are expected to primarily operate during peak electrical consumption hours but will be permitted to operate up to 24 hr/day and 8,760 hr/year. The digester gas-fired engines will be limited to a maximum total combined annual heat input of 185,000 MMBtu/yr for all engines. Total combined NOx emissions from the engines will also be limited to no more than 19,999 lb during any consecutive 12-month rolling period.

III. Equipment Listing

ATCs S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0

841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

IV. BACT Applicability

New emissions units – PE > 2.0 lb/day

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>PE2 for each unit after commissioning (lb/day)</th>
<th>BACT Threshold (lb/day)</th>
<th>SSPE2 (lb/yr)</th>
<th>BACT Triggered?</th>
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</thead>
<tbody>
<tr>
<td>NOx</td>
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<tr>
<td>NOx Worst Case</td>
<td>26.7</td>
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<tr>
<td>SOx</td>
<td>2.2</td>
<td>&gt; 2.0</td>
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<td>Yes</td>
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<tr>
<td>PM10</td>
<td>3.1</td>
<td>&gt; 2.0</td>
<td>N/A</td>
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<tr>
<td>CO</td>
<td>77.9</td>
<td>&gt; 2.0 and SSPE2 ≥ 200,000 lb/yr</td>
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</tr>
<tr>
<td>VOC</td>
<td>6.7</td>
<td>&gt; 2.0</td>
<td>N/A</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* BACT is not required for CO from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

V. Top-Down BACT Analyses for the Digester Gas-Fired Engines

The U.S. Environmental Protection Agency (USEPA) RACT/BACT/LAER Clearinghouse, the California Air Pollution Control Officers Association (CAPCOA) BACT Clearinghouse, the San Joaquin Valley Unified Air Pollution Control District (SVUAPCD) BACT Clearinghouse, the Bay Area Air Quality Management District (BAAQMD), and the South Coast Air Quality Management District (SCAQMD) BACT Guidelines were reviewed to determine potential
control technologies for this class and category of source. The NO\textsubscript{X} emission limits identified in these guidance documents for biogas-fired engines ranged from 0.50 g/bhp-hr to 1.25 g/bhp-hr and were generally similar to the NO\textsubscript{X} emission limit of 0.6 g/bhp-hr that was previously listed as achieved in practice BACT for waste gas-fired engines in rescinded BACT Guideline 3.3.13 (last updated 10/1/2002). Additional resources and technical reports were also reviewed to identify potential controls and alternate equipment to produce electricity from digester gas. The additional controls and alternative technologies considered are discussed below.

1. BACT Analysis for NO\textsubscript{X} Emissions:

   a. Step 1 - Identify all control technologies

   The following control technologies and alternative equipment options have been identified for the production of electricity from agricultural digester gas. Emissions from each technology are estimated based on a review of technical documents, contacts with suppliers, and/or engineering judgment.

1) NO\textsubscript{X} emissions ≤ 0.6 g/bhp-hr or 50 ppmv @ 15% O\textsubscript{2} (lean burn, pre-stratified charge, or equivalent) (Achieved in Practice)

2) NO\textsubscript{X} emissions ≤ 0.15 g/bhp-hr (9-11 ppmv NO\textsubscript{X} @ 15% O\textsubscript{2}) (Non-Selective Catalytic Reduction (NSCR) for rich burn engines, Selective Catalytic Reduction (SCR) for lean burn engines or equivalent) (Technologically Feasible)

3) Small Gas Turbine (< 25 ppmv NO\textsubscript{X} @ 15% O\textsubscript{2}) (Alternate Basic Equipment)

4) Microturbine (≤ 9 ppmv NO\textsubscript{X} @ 15% O\textsubscript{2}) (Alternate Basic Equipment)

5) Fuel Cell (≤ 0.05 lb/MW-hr = 1.5 ppmv NO\textsubscript{X} @ 15% O\textsubscript{2}) (Alternate Basic Equipment)

6) Stirling Engine (≤ 30 ppmv NO\textsubscript{X} @ 3% O\textsubscript{2} external combustion = 10 ppmv NO\textsubscript{X} @ 15% O\textsubscript{2}) (Alternate Basic Equipment)

Description of Control Technologies

1) NO\textsubscript{X} emissions ≤ 0.6 g/bhp-hr (Achieved in Practice)

NO\textsubscript{X} emissions ≤ 0.6 g/bhp-hr have been demonstrated by a number of engines that are fired on various types of biogas. One of the most common ways to satisfy this limit is the use of a lean burn engine. There are a number of lean burn engines on the market that can achieve this limit without additional catalytic controls. Lean burn engines operate with high excess air (fuel lean combustion) which reduces the peak combustion temperature. This inhibits the reactions responsible for thermal NO\textsubscript{X}. Lean burn combustion is usually accomplished through special combustion features such as a pre-combustion chamber. Pre-combustion chambers are designed to allow the initial combustion to occur in a fuel-rich environment. Once the combustion process is initiated, the flame travels from the pre-combustion chamber into the main combustion chamber and subsequently ignites an extremely fuel lean mixture, which reduces NO\textsubscript{X}.
2) **NO\textsubscript{X} emissions ≤ 0.15 g/bhp-hr (9-11 ppmv NO\textsubscript{X} @ 15% O\textsubscript{2}) (Non-Selective Catalytic Reduction (NSCR) or equivalent) (Technologically Feasible)**

Non-Selective Catalytic Reduction (NSCR) is an add-on control technology that can be applied to rich burn engines. NSCR is the same technology as the three-way catalyst that is used to control automobile emissions. NSCR reduces NO\textsubscript{X}, CO and VOC emissions by using a catalyst to promote the chemical reduction of NO\textsubscript{X} into N\textsubscript{2} and O\textsubscript{2}, and the chemical oxidation of VOC and CO into H\textsubscript{2}O and CO\textsubscript{2}. NSCR requires the exhaust to have no more than 0.5% oxygen because unburned hydrocarbons in the exhaust are used as the reducing agent. The use of NSCR requires precise controls to keep the air-to-fuel ratio in the proper range to achieve the desired emission reductions. The applicant has proposed to utilize NSCR systems with their proposed rich burn “Virtual Lean Burn” engines.

3) **Small Gas Turbine (< 25 ppmv NO\textsubscript{X} @ 15% O\textsubscript{2}) (Alternate Basic Equipment)**

Gas turbines are internal combustion engines that operate on the Brayton (Joule) combustion cycle rather than the Otto combustion cycle used in reciprocating internal combustion engines or the diesel cycle for diesel engines. In the Brayton cycle the air flow and fuel injection are steady, and the different parts of the cycle occur continuously within different components of the system. In a gas turbine, fuel is continually injected into the combustion chamber or combustor and air is constantly drawn into the turbine and compressed. All elements of the Brayton cycle occur simultaneously in a gas turbine.

Gas Turbines are one of the cleanest means of generating electricity. With the use of lean pre-mixed combustion or catalytic exhaust cleanup, NO\textsubscript{X} emissions from large gas-fired turbines are generally in the single-digit ppmv range. These levels are generally for natural gas-fired units but they are considered technologically feasible for biogas-fired units.

Gas turbines are available in sizes ranging from 500 kW - 25 MW. Based on contacts with turbine suppliers, biogas-fired turbines used to produce electricity are expected to be available in the size range of 2 - 7 MW. According to Solar Turbines, the smaller biogas-fired turbines are no longer actively produced or marketed since this size range is generally covered by other generation technologies such as reciprocating IC engines and microturbines.

4) **Microturbine (≤ 9 ppmv NO\textsubscript{X} @ 15% O\textsubscript{2}) (Alternate Basic Equipment)**

Microturbines are small gas turbines rated between 25 kW and 500 kW that burn gaseous and liquid fuels to generate electricity or provide mechanical power. Microturbines were developed from turbocharger technologies found in large trucks and the turbines in aircraft auxiliary power units. Microturbines can be operated on a wide variety of fuels, including natural gas, liquefied petroleum gas, gasoline, diesel, landfill gas, and digester gases. According to the California Air Resources Board (ARB), there were approximately 200 biogas-fired microturbines operating in
California as of the year 2006. Microturbines generally have electrical efficiencies of 25-30%; however, the electrical efficiency of larger microturbines (≥ 200 kW) can range from 30-33%. Microturbine manufacturers include Capstone Microturbines and Ingersoll Rand Energy Systems.

Microturbines without add-on controls can meet very stringent emission limits and have significantly lower emissions of NO\textsubscript{x}, CO, and VOC emissions than uncontrolled reciprocating engines because most microturbines operating on gaseous fuels utilize lean premixed (dry low NO\textsubscript{x}, or DLN) combustion technology. Microturbine manufacturers will generally guarantee NO\textsubscript{x} emissions of 9-15 ppmv @ 15% O\textsubscript{2}. However, several emission tests performed on biogas-fired microturbines have indicated even lower emissions. A number of dairy digester gas-fired microturbines have been installed in Europe and some have recently been installed at dairies in the United States, including Twin Birch Dairy and New Hope Farm View Dairy in New York and Den Dulk Dairy in Michigan.

5) Fuel Cell (≤ 0.05 lb-NO\textsubscript{x}/MW-hr = 1.5 ppmv NO\textsubscript{x} @ 15% O\textsubscript{2}) (Alternate Basic Equipment)

Fuel cells use an electrochemical process to produce a direct electric current without the combustion of fuel. Fuel cells use externally supplied reactant gases (hydrogen and oxygen) that are combined in a catalytic process. Like a battery, the electric potential generated by a fuel cell is accessed by connecting an external load to the anode and cathode plates of the fuel cell. Because the fuel for a fuel cell is supplied externally, it does not run down like a battery. However, the fuel cell stack must be periodically replaced because of deactivation of catalytic materials contained in the fuel cell, which results in reduced conversion efficiencies. Since fuel cells require pure hydrogen gas for fuel, hydrocarbons used to power fuel cells must be purified and reformed prior to use. The reformation process can occur in an external fuel processor or through internal reforming in the fuel cell. Both molten carbonate fuel cells and solid oxide fuel cells can internally reform the hydrocarbon fuel to hydrogen for use in the fuel cell. Additionally, these high temperature fuel cells are tolerant of CO\textsubscript{2} that is found biogas.

Fuel cells have recently been commercialized and offer the advantages of high efficiency, nearly negligible emissions, and very quiet power generation. The greatest deterrent to increased use of fuel cells is the significantly higher expense when compared to other generation technologies. These higher costs include the initial capital expense and, for biogas installations, the increased ongoing expenses associated with the extensive cleanup required to remove contaminants that can poison fuel cells. Although this expense can be substantial, biogas-fueled fuel cells have been installed at several wastewater treatment plants and fuel cells have also been fueled with other types of biogas (e.g. landfill gas and brewery wastewater gas). A dairy digester gas-fired fuel cell test project was also installed at Haubenschild Dairy in Minnesota. The fuel cell operated successfully but the cost of

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3 "Staff Report: Initial Statement of Reasons for Proposed Amendments to the Distributed Generation Certification Regulation" (9/1/2006), Cal EPA - ARB, Executive Summary Pg. ii (http://www.arb.ca.gov/regact/dg06/digisor.pdf)

4 See EPA AgStar Program "Guide to Anaerobic Digesters" (http://www.epa.gov/agstar/operational.html)
gas cleanup and reforming to hydrogen for the low temperature Proton Exchange Membrane (PEM) fuel cell was prohibitive. A Cornell University, Manure Management Program study about using fuel cells to generate energy from biogas found that fuel cells were "technically feasible on dairy farms with 1,000 cows" (http://www.manuremanagement.cornell.edu/Docs/Fuel%20Cell%20Technote%202010 -07-04%20Final.pdf).

Based on the information available, the District has determined that this alternative option is technologically feasible and therefore must be further analyzed for cost-effectiveness below.

6) Stirling Engine (≤ 30 ppmv NOX @ 3% O2 external combustion ≈ 10 ppmv NOX @ 15% O2) (Alternate Basic Equipment)

Stirling engines are external combustion engines that use an external heat source to transfer energy to a working fluid sealed inside the engine. The inert working fluid sealed inside Stirling engines is usually either helium or hydrogen. Stirling engines are generally rated in the smaller size range of less than 55 kW and are typically produced for specialized applications. The overall efficiency of Stirling engines is around 15-30%.

Because Stirling engines use external combustion, they have the potential for very low emissions equivalent to those produced by a boiler. A few biogas-fired Stirling external combustion engines were tested at landfills but there were problems keeping the working fluid completely sealed in the engines. No digester gas-fired external combustion engines that are currently operating could be identified. It is not known if Stirling engines are currently being commercially produced. The main producer of Stirling engines, STM Power, closed in 2007 and was only recently revived as Stirling Biopower. Therefore, this option will not be evaluated further for this project.

b. Step 2 - Eliminate technologically infeasible options

1) Stirling Engine (≤ 30 ppmv NOX @ 3% O2 external combustion ≈ 10 ppmv NOX @ 15% O2) (Alternate Basic Equipment)

The Stirling engines tested at landfills had problems containing the working fluid and the small size of the units would likely be inadequate for the proposed project. Additionally, it is not known if Stirling engines are currently being commercially produced in sufficient numbers for this project. Therefore, Stirling engines are not considered feasible for this particular project and will be eliminated from consideration at this time.

c. Step 3 - Rank remaining options by control effectiveness

1) Fuel Cell (≤ 0.05 lb/MW-hr ≈ 1.5 ppmv NOX @ 15% O2) (Alternate Basic Equipment)

2) NOX emissions ≤ 0.15 g/bhp-hr (9-11 ppmv NOX @ 15% O2)

   a. NOX emissions ≤ 0.15 g/bhp-hr (9-11 ppmv NOX @ 15% O2) (Non-Selective Catalytic Reduction (NSCR) or equivalent) (Technologically Feasible)
b. Microturbine ($\leq 9$ ppmv NO$_x$ @ 15% O$_2$) (Alternate Basic Equipment)

3) Gas Turbine ($< 25$ ppmv NO$_x$ @ 15% O$_2$)

4) NO$_x$ emissions $\leq 0.6$ g/bhp-hr or 50 ppmv@ 15% O$_2$ (lean burn, pre-stratified charge, or equivalent) (Achieved in Practice)

d. 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 engines will be operated as a separate stationary source than the dairy farm; therefore, the District has determined that the IC engines are non-agricultural IC engines. The rich burn, digester gas-fired, engines are subject to the District Rule 4702 emission limits for non-agricultural, rich 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 engines will be based on the emission limits for non-agricultural, rich burn, waste gas-fired IC engines contained in District Rule 4702, Section 5.1.1, Table 1, 1.a (50 ppmvd NO$_x$, 2,000 ppmvd CO, and 250 ppmvd VOC (all measured @ 15% O$_2$)).

Option 1: Fuel Cells ($\leq 0.05$ lb/MW-hr $\approx 1.5$ ppmv NO$_x$ @ 15% O$_2$) (Alternate Basic Equipment)

Since Fuel Cells have reduced NO$_x$ 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
- The total annual heating value for all of the digester gas produced will not exceed 185,000 MMBtu/yr. This is approximately equal to 308.333 MMscf/yr assuming 600 Btu/scf.
- Maximum total daily heating value for all of the digester gas produced (summer): 449,406 MMBtu/day. This is approximately equal to 749,010 scf/day assuming 600 Btu/scf.
- Biogas F-Factor: 9,100 dscf/MMBtu (60 °F)
• Higher Heating Value for Dairy Digester Gas: 600 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)
• Btu to kW-hr conversion: 3,413 Btu/kW-hr

Assumptions for Proposed Digester Gas-Fired IC Engines (S-7767-1 thru 12)
• The total annual heating value for all of the digester gas produce will not exceed 185,000 MMBtu/yr. This is approximately equal to 23,988,212 bhp-hr/yr (based on 33% engine).
• Typical mechanical efficiency for engine: 33%
• Generator Efficiency: 95%
• 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/lkW-hr (estimated based on review conducted by District)
• Rule 4702 NO\textsubscript{x} emission limit for non-agricultural, rich burn, waste gas-fired IC engines: 50 ppmv @ 15% O\textsubscript{2} = 0.1942 lb/MMBtu
• Rule 4702 VOC emission limit for non-agricultural, rich burn, waste gas-fired IC engines: 250 ppmv @ 15% O\textsubscript{2} as CH\textsubscript{4} = 0.3377 lb/MMBtu

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 biogas conditioning system: $7,000/kW (based on review conducted by District)
• Typical operation costs for fuel cells: $0.0215/lkW-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)\(^5\)
• Fuel Cell NO\textsubscript{x} emissions: 0.05 lb/MW-hr = 0.0058 lb/MMBtu (≤ 1.5 ppmv NO\textsubscript{x} @ 15% O\textsubscript{2}) (Note: fuel cells are usually certified to the ARB Distributed Generation Certification level of 0.07 lb-NO\textsubscript{x}/MW-hr; however, measured emissions from many fuel cells have been lower)

\(^5\) Examples of fuel cell stack replacement costs and intervals are provided in the following links:
http://masstech.org/Project%20Deliverables/GB_GSI_FeasibilityStudy_Gill_Montague.pdf,
http://www.fuelcellenergy.com/files/Copy%20of%20DFC300MA%20Spec%209318.pdf

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- Fuel Cell VOC emissions: \(0.02 \text{ lb-VOC/MW-hr} = 0.0027 \text{ lb/MMBtu} \leq 2.0 \text{ ppmv VOC @ 15\% O}_2\text{ as CH}_4\text{ 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: 2,140 kW (estimated based on 449.406 MMBtu/day and 39\% efficiency)

- Unlike the proposed engines, a high-temperature fuel cell power plant must primarily operate at steady state conditions; there would not be the ability to store gas to generate more electricity during peak hours, which is the current business plan of the applicant. Because the price paid for electricity is greater during peak hours and less during other times, the price paid for electricity generated by a fuel cell power plant would be less. This would require the operator to alter their plans of operation and result in less revenue per kW-hr of electricity generated potentially offsetting the revenue from increased power generating capacity because of the higher efficiency of a fuel cell power plant. For more conservative analysis, the difference in the cost of peak and off-peak electricity was not considered in this comparison.

- 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 the proposed engine with fuel cells is calculated based on the difference in cost of a fuel cell power plant and the 12 IC engines.

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

\[(2,140 \text{ kW} \times 7,000/\text{kW}) - (12 \times 600 \text{ kW} \times 1,475/\text{kW}) = 4,360,000\]

**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.

\[
A = \frac{P \times i \times (1+i)^N}{(1+i)^N-1}
\]

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

\[
A = \frac{\$4,360,000 \times 0.1 \times (1.1)^{10}}{(1.1)^{10}-1} = 709,570/\text{year}
\]
Annual Costs

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

Proposed IC Engines
185,000 MMBtu/yr x 10^6 Btu/MMBtu x 1 kW-hr/3,413 Btu x 0.33 (engine efficiency) x 0.95 (generator efficiency) = 16,993,115 kW-hr/year

Fuel Cells (Alternate Equipment)
449,406 MMBtu/day x 10^6 Btu/MMBtu x 1 day/24 hr x 1 kW-hr/3,413 Btu x 0.39 (electrical efficiency) = 2,140 kW
185,000 MMBtu/yr x 10^6 Btu/MMBtu x 1 kW-hr/3,413 Btu x 0.39 (electrical efficiency) = 21,139,760 kW-hr/year

Revenue from Increased Electric Generation from a Fuel Cell Power Plant
(21,139,760 kW-hr/yr - 16,993,115 kW-hr/yr) x $0.08843/kW-hr = $366,688/year

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

Proposed IC Engines
16,993,115 kW-hr/yr x $0.0152/kW-hr = $258,295/year

Fuel Cells (Alternate Equipment)
21,139,760 kW-hr/yr x $0.0215/kW-hr = $454,505/year

Annual Costs of Increased Maintenance
$454,505/yr - $258,295/yr = $196,210/year

Fuel Cell Stack replacement Costs
$500/kW-yr x 2,140 kW = $1,070,000/year

Total Increased Annual Costs for Fuel Cell System as an Alternative to Proposed Engines
$709,570/year - $366,688/year + $196,210/year + $1,070,000/year = $1,609,092/year

NO\textsubscript{X} Emission Reductions:

NO\textsubscript{X} Emission Factors:
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 agricultural IC engines contained in District Rule 4702, Section 5.1.1, Table 1, 1.a.
The following emissions factors will be used for the cost analysis:

**District Standard Emissions:** 0.1942 lb-NO\textsubscript{X}/MMBtu (50 ppmv NO\textsubscript{X} @ 15% O\textsubscript{2}) and 0.3377 lb-VOC/MMBtu (250 ppmv VOC @ 15% O\textsubscript{2} as CH\textsubscript{4})

**Emissions from Fuel Cells as Alternative Equipment:** 0.0058 lb-NO\textsubscript{X}/MMBtu (0.05 lb-NO\textsubscript{X}/MW-hr; 1.5 ppmv @ 15% O\textsubscript{2}) and 0.0027 lb-VOC/MMBtu (0.02 lb-VOC/MW-hr; 2 ppmv @ 15% O\textsubscript{2} as CH\textsubscript{4})

**Emission Reductions:**

**Proposed Engine Compared to Fuel Cells based on District Standard Emission Reductions**

\[\text{NO}_\text{x} \text{ Emission Reductions (50 ppmv } \rightarrow \text{ 1.5 ppmv)}\]
\[185,000 \text{ MMBtu/yr} \times (0.1942 \text{ lb-NO}_\text{x}/\text{MMBtu} - 0.0058 \text{ lb-NO}_\text{x}/\text{MMBtu}) = 34,854 \text{ lb-NO}_\text{x}/\text{year} (17.43 \text{ ton/year})\]

\[\text{VOC Emission Reductions (250 ppmv } \rightarrow \text{ 2.0 ppmv)}\]
\[185,000 \text{ MMBtu/yr} \times (0.3377 \text{ lb-VOC/MMBtu} - 0.0027 \text{ lb-VOC/MMBtu}) = 61,975 \text{ lb-NO}_\text{x}/\text{year} (30.99 \text{ ton/year})\]

**Multi-Pollutant Cost Effectiveness Thresholds (MCET) for NO\textsubscript{x} and VOC Reductions based on District Standard Emission Reductions**

\[(17.43 \text{ ton-NO}_\text{x}/\text{year} \times $24,500/\text{ton-NO}_\text{x}) + (30.99 \text{ ton-VOC/year} \times $17,500/\text{ton-VOC}) = $969,360/\text{year}\]

As shown above, the annualized capital cost of this alternate option exceeds the Multi-Pollutant Cost Effectiveness Threshold (MCET) calculated for the NO\textsubscript{x} 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: NO\textsubscript{x} emissions \leq 0.15 \text{ g/bhp-hr} (9-11 \text{ ppmv NO}_\text{x} @ 15\% \text{ O}_\text{2}) (Non-Selective Catalytic Reduction (NSCR) or equivalent) (Technologically Feasible)**

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

Although the District considers 0.15 g-NO\textsubscript{x}/bhp-hr to be technologically feasible BACT for biogas-fired engines, there remains some uncertainty if this emission limit can be met consistently given the fact that previous installations of catalysts on biogas-fired engines have not been successful. Because of this remaining uncertainty, conditions will be incorporated into the ATC permit allowing NO\textsubscript{x} emissions above 0.15 g-NO\textsubscript{x}/bhp-hr (but not greater than the achieved in practice BACT level of 0.6 g-NO\textsubscript{x}/bhp-hr (\approx 44 ppmv)) provided that the other conditions in the ATC are met and the applicant makes a satisfactory effort to reduce NO\textsubscript{x} emissions to the lowest possible level to satisfy BACT.
Option 3: Gas Turbine with NO\textsubscript{X} emissions ≤ 25 ppmv @ 15% \textsubscript{O}_2 (Alternate Basic Equipment)

The applicant’s proposal to install controls on the proposed IC engines to attempt to reduce NO\textsubscript{X} emissions to below 0.15 g/bhp-hr (9-11 ppmv NO\textsubscript{X} @ 15% \textsubscript{O}_2) is more stringent than this option; therefore this option will not be considered.

Option 4: NO\textsubscript{X} emissions ≤ 0.6 g/bhp-hr or 50 ppmv @ 15% \textsubscript{O}_2 (Achieved in Practice)

This option is achieved practice; therefore, no cost analysis is required.

e. Step 5 - Select BACT

Pursuant to the above Top-Down BACT Analysis, BACT for the Digester Gas-fired Engines must be satisfied with the following:

- NO\textsubscript{X}: 1) NO\textsubscript{X} emissions no greater than 0.6 g/bhp-hr (Achieved in Practice) &
  2) Applying controls to reduce NO\textsubscript{X} emissions to ≤ 0.15 g/bhp-hr (9-11 ppmv @ 15% \textsubscript{O}_2)

The applicant has proposed to apply NSCR systems to digester gas-fired rich burn IC engines to reduce NO\textsubscript{X} emissions to ≤ 0.15 g/bhp-hr (9-11 ppmv @ 15% \textsubscript{O}_2) and is also proposing that NO\textsubscript{X} emissions from the engines will not exceed 0.6 g/bhp-hr if the NSCR system does not result in the expected NO\textsubscript{X} reductions. Therefore, the BACT requirements are satisfied.

2. BACT Analysis for SO\textsubscript{X} Emissions:

a. Step 1 - Identify all control technologies

The following technologies were identified to reduce SO\textsubscript{X} emissions from the proposed engine:

1) Dry absorption of \textsubscript{H}_2\textsubscript{S} from the fuel gas (98-99% - Technologically Feasible)
2) Wet absorption of \textsubscript{H}_2\textsubscript{S} from the fuel gas (95-98% - Technologically Feasible)
3) Sulfur Content of fuel gas not exceeding 50 ppmv \textsubscript{H}_2\textsubscript{S} (90-98% - Achieved in Practice/Contained in SIP)
4) Influent fuel \textsubscript{H}_2\textsubscript{S} reduction by addition of chemicals to the digester (90% - Technologically Feasible)
5) Water scrubbing of \textsubscript{H}_2\textsubscript{S} from the fuel gas (80% - Technologically Feasible)

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

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.
c. Step 3 - Rank remaining options by control effectiveness

The control efficiency of each of the options above is estimated and the controls are ranked below based on the control effectiveness.

1) Dry absorption of H₂S from the fuel gas (98-99% - Technologically Feasible)
2) Wet absorption of H₂S from the fuel gas (95-98% - Technologically Feasible)
3) Sulfur Content of fuel gas not exceeding 50 ppmv H₂S (90-98% - Achieved in Practice)
4) Influent fuel H₂S reduction by addition of chemicals to the digester (90% - Technologically Feasible)
5) Water scrubbing of H₂S from the fuel gas (80% - Technologically Feasible)

d. Step 4 - Cost Effectiveness Analysis

Dairy digester gas can have a sulfur content greater than 2,500 ppmv as H₂S. The applicant has proposed to use an iron sponge dry scrubber (or an equivalent sulfur removal system) to reduce the sulfur content of the gas combusted in the engines to ≤ 50 ppmv as H₂S. Because the applicant has chosen the most effective option listed above, a dry scrubber with a removal efficiency of 98%, no cost analysis is required.

e. Step 5 - Select BACT

BACT for SOₓ emissions from the proposed engines is a dry scrubber that reduces the sulfur compounds in the gas to 50 ppmv H₂S (95-99% control). The applicant has proposed to use an iron sponge dry scrubber to reduce the sulfur content of the digester gas combusted in the engines to ≤ 50 ppmv as H₂S. Therefore, the BACT requirements for SOₓ are satisfied.

3. BACT Analysis for PM₁₀ Emissions:

a. Step 1 - Identify all control technologies

Combustion of gaseous fuels generally does not result in significant emissions of particulate matter. Dairy anaerobic digester gas is the planned fuel for the proposed IC engines. The anaerobic digester gas will be composed primarily of methane (approximately 60% molar composition) and CO₂ (approximately 40% molar composition) and is expected to burn in a fairly clean manner. Particulate emissions from combustion of the digester gas are expected to primarily result from the incineration of fuel-born sulfur compounds (mostly H₂S) resulting in the formation of sulfur-containing particulate. Therefore, scrubbing of the digester gas is the principal means to reduce particulate emissions.

The following control was identified to reduce particulate matter emissions from combustion of the digester gas as fuel in the proposed engines:

1) Scrubbing Gas Such that the Sulfur Content of fuel gas does not exceed 50 ppmv H₂S (Achieved in Practice/Contained in SIP)
b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

1) Scrubbing Gas Such that the Sulfur Content of fuel gas does not exceed 50 ppmv H₂S (Achieved in Practice/Contained in SIP)

d. Step 4 - Cost Effectiveness Analysis

The only option listed above has been identified as achieved in practice for SOₓ emissions for the same source category. Therefore, the option required and is not subject to a cost analysis.

e. Step 5 - Select BACT

BACT for PM₁₀ emissions from the proposed engines is a scrubber that reduces the sulfur compounds in the gas to 50 ppmv H₂S. The applicant has proposed to use an iron sponge dry scrubber (or an equivalent sulfur removal system) to reduce the sulfur content of the digester gas combusted in the engines to ≤ 50 ppmv as H₂S. Therefore, the BACT requirements for PM₁₀ are satisfied.

4. BACT Analysis for VOC Emissions:

a. Step 1 - Identify all control technologies

District Source Tests of biogas-fired engines and other technical information resources were reviewed to determine the achieved in practice VOC Emission Limit for Biogas Fired Engines. The following emission data regarding VOC emissions was obtained from District Source Test Records:

Tulare Energy, Visalia Landfill Gas-Fired Lean Burn IC Engine (1,150 bhp each)
S-2890-1-4: VOC Emissions: 0.042 g/bhp-hr; 7.2 ppmv VOC @ 15% O₂ as CH₄ (11/15/06 Source Test)
S-2890-2-4: VOC Emissions: 0.024 g/bhp-hr; 4.2 ppmv VOC @ 15% O₂ as CH₄ (11/15/06 Source Test)

Visalia Wastewater Treatment Plant Digester Gas-Fired Lean Burn IC Engines (620 bhp each)
S-984-10-3: VOC Emissions: 0.0476 g/bhp-hr; 9.35 ppmv VOC @ 15% O₂ as CH₄ (10/28/08 Source Test)
S-984-13-2: VOC Emissions: 0.0514 g/bhp-hr; 10.1 ppmv VOC @ 15% O₂ as CH₄ (7/13/06 Source Test)
Tulare City Wastewater Treatment Plant Digester Gas-Fired Lean Burn IC Engine (670 bhp)
S-548-3-2: VOC Emissions: 12.1 ppmv VOC @ 15% O₂ as CH₄ (9/5/08 Source Test)

Stockton Wastewater Treatment Facility Digester Gas-Fired Lean Burn IC Engines (1,408 bhp each)
N-811-21-3: VOC Emissions: 0.119 g/bhp-hr; 20.54 ppmv VOC @ 15% O₂ as CH₄
(10/11/06 Source Test)
N-811-22-3: VOC Emissions: 0.138 g/bhp-hr; 24.77 ppmv VOC @ 15% O₂ as CH₄
(5/23/07 Source Test)
N-811-23-3: VOC Emissions: 0.114 g/bhp-hr; 20.77 ppmv VOC @ 15% O₂ as CH₄
(10/31/07 Source Test)

City of Manteca Wastewater Treatment Facility Digester Gas-Fired Lean Burn IC Engine (643 bhp)
N-1049-8-0: VOC Emissions: 34.3 ppmv VOC @ 15% O₂ as CH₄ (6/6/06 Source Test)
(Note: the engine serves a 450 kW generator but because of insufficient digester gas, the engine only runs at part load. During this source test the engine was producing 150 kW of electricity and natural gas supplied approximately 50% of the heat value combusted in the engine. Although the VOC emissions are not very high, they would be even less if the engine were run at closer to full load. VOC emissions would also likely be less if the engine were fired solely on digester gas since the source tests reviewed for engines that combusted both digester gas and natural gas showed lower VOC emissions when the engines were fired on digester gas.)

Valencia Wastewater Treatment Facility Digester Gas-Fired IC Engine with a Clean Burn Pre-Combustion Chamber (825 bhp)
Total Hydrocarbon emissions: 0.68 lb/MW-hr (≈ 0.22 g/bhp-hr) (note: because this value is a total hydrocarbon measurement that includes methane, VOC emissions will be much less)

Biogas-Fired Engine at Landfills
Combustion control devices for landfill collection systems at landfills subject to the standards of NSPS, 40 CFR 60, Subpart WWW must reduce emissions of non-methane organic compounds (NMOC) by 98% or meet an NMOC emission limit of 20 ppmvd NMOC @ 3% O₂ as hexane. There are landfills currently using engines as control devices to meet this standard. Although some landfills may use an afterburner to meet the standard, many meet the standard by using only an IC engine. When converted the NSPS emission standard is approximately to 0.16 - 0.20 g-VOC/bhp-hr.

Landfill gas, though not identical to anaerobic digester gas, is generated by a similar anaerobic process and has similar characteristics. The main difference between landfill

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and digester gas is that landfill gas will typically contain more CO₂ and have a lower heating value, which would make incomplete combustion and higher VOC emissions more likely for landfill gas than for digester gas. Therefore, digester gas-fired engines are also capable of meeting this standard, as shown by the source tests above.

**Achieved in Practice Conclusion**

Based on the above information, it has been determined that an emission limit of 0.20 g-VOC/bhp-hr (≈ 40 ppmv VOC @ 15% O₂ as CH₄) is achieved in practice for digester gas-fired engines. This limit will be listed below.

The following technologies were identified to reduce VOC emissions:

1. VOC emissions ≤ 0.20 g/bhp-hr (lean burn or equivalent and positive crankcase ventilation) (Achieved in Practice)
2. Fuel Cell (≤ 0.02 lb/MW-hr = 2.0 ppmv VOC @ 15% O₂ as CH₄) (Alternate Basic Equipment)
3. Microturbine (≤ 30 ppmv VOC @ 15% O₂ as CH₄) (Alternate Basic Equipment)

**b. Step 2 - Eliminate technologically infeasible options**

There are no technologically infeasible options to eliminate from step 1.

**c. Step 3 - Rank remaining options by control effectiveness**

1. Fuel Cell (≤ 0.02 lb/MW-hr = 2.0 ppmv VOC @ 15% O₂ as CH₄) (Alternate Basic Equipment)

2.a) VOC emissions ≤ 0.20 g/bhp-hr (Achieved in Practice)

2.b) Microturbine (≤ 35 ppmv VOC @ 15% O₂ as CH₄) (Alternate Basic Equipment)

**d. Step 4 - Cost Effectiveness Analysis**

Option 1: Fuel Cell (≤ 0.02 lb/MW-hr = 2.0 ppmv VOC @ 15% O₂ as CH₄) (Alternate Basic Equipment)

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

Option 2.a: VOC emissions ≤ 0.20 g/bhp-hr (Achieved in Practice)

This option is achieved practice; therefore, no cost analysis is required.

Option 2.b: Microturbines (≤ 35 ppmv VOC @ 15% O₂) (Alternate Basic Equipment)

Test results have indicated that biogas-fired microturbines are capable of meeting very low VOC emission limits. Microturbines are commonly used at landfills and therefore the specifications for microturbines will generally indicate that they are capable of
meeting the NSPS, 40 CFR 60, Subpart WWW non-methane organic compounds (NMOC) emission standard of 98% destruction or 20 ppmvd NMOC @ 3% O₂ as hexane. As shown above, efficient reciprocating IC engines are also capable of meeting this standard.

The actual amount of VOC emitted from an efficient lean burn IC engine or microturbine will actually be more dependent on the type of fuel used and the VOC content of the fuel prior to combustion. Because digester gas generally contains only small amounts of VOCs, the difference in emissions for combustion in an engine meeting BACT and a microturbine will not be substantial. Therefore, this option will be deemed equivalent to the achieved in practice BACT level shown above for digester gas-fired reciprocating IC engines. Because microturbines will only be listed as an equivalent alternative option to the achieved in practice standard for VOC and are not being required, no cost analysis is necessary.

e. Step 5 - Select BACT

BACT for VOC emissions from the proposed engines is VOC emissions not exceeding 0.20 g/bhp-hr. The applicant has proposed IC engines with VOC emissions of 0.15 g/bhp-hr. Therefore, the BACT requirements for VOC are satisfied.
APPENDIX B

Summary of Health Risk Assessment (HRA) and Ambient Air Quality Analysis (AAQA)
A. RMR SUMMARY

<table>
<thead>
<tr>
<th>Categories</th>
<th>841 bhp Digester Gas ICE (Each Unit 1-0 through 12-0)</th>
<th>Project Totals</th>
<th>Facility Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prioritization Score</td>
<td>0.0792</td>
<td>0.95</td>
<td>0.95</td>
</tr>
<tr>
<td>Acute Hazard Index</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Chronic Hazard Index</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Maximum Individual Cancer Risk ($10^{-6}$)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>T-BACT Required?</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Permit Conditions?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Proposed Permit Conditions

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

Unit # 1-0 through 12-0

1. 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]

B. RMR REPORT

I. Project Description

Technical Services received a request on May 18, 2010, to perform an Ambient Air Quality Analysis and a Risk Management Review for the installation of 12 digester gas-fired IC engines. A maximum of four engines were proposed to undergo commissioning at any one time.
II. Analysis

Toxic emissions for this proposed unit were calculated using digester gas internal combustion emission factors developed by San Diego County Air Pollution Control District. 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:

<table>
<thead>
<tr>
<th>Analysis Parameters</th>
<th>Units 1-0 through 12-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughput (MMCF/yr)</td>
<td>89.02788</td>
</tr>
<tr>
<td>Closest Receptor (m)</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td>Max Hours per Year</td>
</tr>
</tbody>
</table>

Technical Services performed modeling for criteria pollutants CO, NOx, SOx and PM10; as well as a RMR. The emission rates used for criteria pollutant modeling for normal operation were 3.2447 lb/hr CO, 1.1125 lb/hr NOx, 0.0927 lb/hr SOx, and 0.1298 lb/hr PM10. The emission rates used for criteria pollutant modeling for commissioning operation were 14.8328 lb/hr CO, 14.8328 lb/hr NOx, 0.0927 lb/hr SOx, and 0.1298 lb/hr PM10. The analysis was conducted under a worst-case scenario of 4 engines undergoing commissioning, and the remaining 8 engines operating normally.

The results from the Criteria Pollutant Modeling are as follows:

<table>
<thead>
<tr>
<th>Diesel ICE</th>
<th>1 Hour</th>
<th>3 Hours</th>
<th>8 Hours</th>
<th>24 Hours</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Pass</td>
<td></td>
<td>Pass</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>NOx</td>
<td>Pass</td>
<td>X</td>
<td>X</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>SOx</td>
<td>Pass</td>
<td>Pass</td>
<td></td>
<td>X</td>
<td>Pass</td>
</tr>
<tr>
<td>PM10</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Pass</td>
<td>Pass</td>
</tr>
</tbody>
</table>

*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).
2 The NOx 1-hour standard was passed using the Plume Volume Molar Ratio Method and the District-developed Tier IV (Draft) method for modeling the EPA NO2 standard.

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.

Attachments:

A. RMR request from the project engineer
B. Additional information from the applicant/project engineer
C. Toxic emissions summary
D. Prioritization score
E. AAQA Summary
F. Tiered Modeling Summary
G. Facility Summary
APPENDIX C

Total Toxic and Hazardous Air Pollutant (HAP) Emissions from the Proposed IC Engines
Toxic Emissions for ABEC – Bidart-Old River, LLC (Facility S-7767)

The following table provides the total toxic emissions calculated for the proposed digester gas-fired IC engines. The total toxic emissions are calculated using emissions factors for toxics provided by the Technical Services Division of the SJVAPCD for combustion of digester gas in IC engines and based on a maximum total combined fuel input of 308.333333 MMscf/yr (185,000 MMBtu/yr and 600 Btulscf) for all the IC engines at the facility.

<table>
<thead>
<tr>
<th>Pollutant ID #</th>
<th>Pollutant Name</th>
<th>Emission Factor (lb/MMScf)</th>
<th>Annual Usage (MMScf/yr)</th>
<th>Federal HAP Emissions (lb/yr)</th>
<th>Other Toxic Emissions (lb/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50000</td>
<td>Formaldehyde</td>
<td>1.3099999943</td>
<td>308.333333</td>
<td>403.9166486</td>
<td></td>
</tr>
<tr>
<td>71432</td>
<td>Benzene</td>
<td>0.178000003</td>
<td>308.333333</td>
<td>54.88333423</td>
<td></td>
</tr>
<tr>
<td>75092</td>
<td>Methylene Chloride (Dichloromethane)</td>
<td>1E-04</td>
<td>308.333333</td>
<td>0.0308333333</td>
<td></td>
</tr>
<tr>
<td>78933</td>
<td>Methyl Ethyl Ketone**</td>
<td>1E-04</td>
<td>308.333333</td>
<td></td>
<td>0.0308333333</td>
</tr>
<tr>
<td>79005</td>
<td>1,1,2-Trichloroethane (Vinyl Trichloride)</td>
<td>1E-04</td>
<td>308.333333</td>
<td>0.0308333333</td>
<td></td>
</tr>
<tr>
<td>79016</td>
<td>Trichloroethylene</td>
<td>0.0003</td>
<td>308.333333</td>
<td>0.092500004</td>
<td></td>
</tr>
<tr>
<td>100414</td>
<td>Ethyl Benzene</td>
<td>0.001</td>
<td>308.333333</td>
<td>0.30833348</td>
<td></td>
</tr>
<tr>
<td>106467</td>
<td>p-Dichlorobenzene</td>
<td>0.0018</td>
<td>308.333333</td>
<td>0.55499999</td>
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<tr>
<td>107062</td>
<td>Ethylene Dichloride (1,2-Dichloroethylene)</td>
<td>0.0014</td>
<td>308.333333</td>
<td>0.431666651</td>
<td></td>
</tr>
<tr>
<td>108883</td>
<td>Toluene</td>
<td>0.064800002</td>
<td>308.333333</td>
<td>19.9800005</td>
<td></td>
</tr>
<tr>
<td>108907</td>
<td>Chlorobenzene</td>
<td>0.0002</td>
<td>308.333333</td>
<td>0.06166665</td>
<td></td>
</tr>
<tr>
<td>110543</td>
<td>n-Hexane</td>
<td>0.064800002</td>
<td>308.333333</td>
<td>19.9800005</td>
<td></td>
</tr>
<tr>
<td>127184</td>
<td>Perchloroethylene (Tetrachloroethylene)</td>
<td>0.0005</td>
<td>308.333333</td>
<td>0.154166674</td>
<td></td>
</tr>
<tr>
<td>1330207</td>
<td>Xylenes</td>
<td>0.0045</td>
<td>308.333333</td>
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</tr>
<tr>
<td>7647010</td>
<td>Hydrochloric Acid (Hydrogen Chloride)</td>
<td>0.6460000028</td>
<td>308.333333</td>
<td>199.1833416</td>
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</tr>
<tr>
<td>7664417</td>
<td>Ammonia</td>
<td>0.0048</td>
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<td>1.480000069</td>
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<tr>
<td>7783064</td>
<td>Hydrogen Sulfide***</td>
<td>0.021500001</td>
<td>308.333333</td>
<td></td>
<td>6.629166885</td>
</tr>
</tbody>
</table>

Total Federal HAP Emissions (lb/yr)  701 lb/yr

* The emissions factors for toxics from combustion of digester gas in IC engines were developed by San Diego County Air Pollution Control District Based on Pt Loma Raw Gas (8/23/1999).
**On December 19, 2005 the EPA removed methyl ethyl ketone (MEK) from the list of Federal HAPs.
***A clerical error led to the inadvertent addition of H2S to the Section 112(b) list of Hazardous Air Pollutants but it was removed in 1991.
APPENDIX D
Draft ATCs
(S-7767-1-0, -2-0, -3-0, -4-0, -5-0, -6-0, -7-0, -8-0, -9-0, -10-0, -11-0, & -12-0)
San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-1-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
2828 SOUTH STREET SUITE 500
DALLAS, TX 75201-1438

LOCATION:
20400 OLD RIVER ROAD
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. (98) No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. (14) Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. (15) No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. (1898) The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. (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]
6. (3203) This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director APCO

DAVID WARNER, Director of Permit Services
S-7767-1-0: Aug 2 2010 8:17AM - NORMAN - Joint Inspection Required with NORMAN
Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. {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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. If the emissions exceed, the permittee may stipulate that an emissions violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmv NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. (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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

47. (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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 201]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 201]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-8-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
2828 ROUTH STREET SUITE 500
DALLAS, TX 75201-1438

LOCATION: 20400 OLD RIVER ROAD
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION: 841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. {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]
6. {3203} This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director APCO

DAVID WARNER, Director of Permit Services
Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. (1897) 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-C02/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

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]
Conditions for S-7767-8-0 (continued)

35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. 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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. \{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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totaling mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

47. \{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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-9-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
2828 ROUTH STREET SUITE 500
DALLAS, TX 75201-1438

LOCATION: 20400 OLD RIVER ROAD
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. (98) No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. (14) Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. (15) No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. (1898) The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. (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]
6. (3203) This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director APCO

DAVID WARNER. Director of Permit Services
Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. {1897} 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr ( = 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. 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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO. 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmv NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. (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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJ]

47. (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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]

Conditions continue on next page
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-10-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
2828 SOUTH STREET SUITE 500
DALLAS, TX 75201-1438

LOCATION: 20400 OLD RIVER ROAD
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. (98) No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. (14) Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. (15) No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. (1898) The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. (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]
6. (3203) This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director APCO

DAVID WARNER: Director of Permit Services
S-7767-10-0 Aug 2 2010 8:1AM - NORMANR Joint Inspection Required with NORMANR
Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. {1897} 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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 JJJ]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJ]

34. {3791} 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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJ]

37. 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]

38. 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 JJJ]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the fuel sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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 detailed information regarding 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. 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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

47. 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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will provide a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 201]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2201]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-11-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
2828 ROUTH STREET SUITE 500
DALLAS, TX 75201-1438

LOCATION: 20400 OLD RIVER ROAD
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. (98) No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. (14) Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. (15) No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. (1898) The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. (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]
6. (3203) This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadrelin, Executive Director APCO

DAVID WARNER, Director of Permit Services
SOUTHERN REGIONAL OFFICE • 34946 FLYOVER COURT • BAKERSFIELD, CA 93308 • (661) 392-5500 • FAX (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

34. {3791} 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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. 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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO. 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, 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 shall then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (≈ 44 ppmvd NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. 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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

47. 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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-12-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
2828 ROUTH STREET SUITE 500
DALLAS, TX 75201-1438

LOCATION: 20400 OLD RIVER ROAD
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM)POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. (98) No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. (14) Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. (15) No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. (1898) The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. (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]
6. (3203) This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadreedin, Executive Director APCO

DAVID WARNER, Director of Permit Services
Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. (1897) 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rules 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rules 2201 and 4702]

31. 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 Rules 2201 and 40 CFR 60, Subpart JJJJ]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. [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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. {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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

47. {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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOX emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOX emissions for the units each month, and 6) the calculated total NOX emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. 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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. {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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resetable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

47. {3787} 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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
San Joaquin Valley  
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-2-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC  
Mailing Address: C/O CALIFORNIA BIOENERGY LLC  
2828 ROUTH STREET SUITE 500  
DALLAS, TX 75201-1438

LOCATION:  
20400 OLD RIVER ROAD  
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:  
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECYCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. \(98\) No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. \(14\) Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. \(15\) No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. \(1898\) The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. \(3202\) 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]
6. \(3203\) This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadrelin, Executive Director APCO

DAVID WARNER, Director of Permit Services  
S-7767-2-0: Aug 2 2010 8:17AM - NORMAIR - Joint Inspection Required with NORMAIR  
Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. [1897] 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. 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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmv NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. 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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJ]

47. 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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MBHtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMHtu; during normal operation: 0.171 lb-NOx/MMHtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-3-0
LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
LOCATION: 2828 ROUTH STREET SUITE 500
DALLAS, TX 75201-1438
LOCATION: 20400 OLD RIVER ROAD
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. (98) No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. (14) Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. (15) No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. (1898) The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. (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]
6. (3203) This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director APCO

DAVID WARNER, Director of Permit Services
S-7767-3-0: Aug 2 2010 8:17AM - NORMANR Joint Inspection Required with NORMANR

Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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 JJJ]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJ]

34. {3791} 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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. 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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, 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. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. {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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

47. {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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-4-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
2828 ROUTH STREET SUITE 500
DALLAS, TX 75201-1438

LOCATION:
20400 OLD RIVER ROAD
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. {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]
6. {3203} This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadreolin, Executive Director APCO

DAVID WARNER, Director of Permit Services
5-7767-4-0, Aug 2 2010 8:19AM - KORMA609
Join Inspection Required with KORMA609
Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. [1897] 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

34. (3791) 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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. (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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO. 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmv NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. {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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

47. {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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-5-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
                  2828 SOUTH STREET SUITE 500
                  DALLAS, TX 75201-1438

LOCATION: 20400 OLD RIVER ROAD
           BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. {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]
6. {3203} This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadreddin, Executive Director APCO
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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 JJJ]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJ]

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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. 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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

44. 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]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJJJ]

47. 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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District will respond to a permittee request for use of an alternate emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2201]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2201]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-6-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
                 2828 ROUTH STREET SUITE 500
                 DALLAS, TX 75201-1438

LOCATION: 20400 OLD RIVER ROAD
           BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. {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]
6. {3203} This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. THIS IS NOT A PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadrelin, Executive Director APCO

DAVID WARNER, Director of Permit Services
S-7767-6-0  Aug 2 2010  8:19AM - NORMAIR  Joint Inspection Required with NORMAIR
Southern Regional Office  •  34946 Flyover Court  •  Bakersfield, CA 93308  •  (661) 392-5500  •  Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. (1897) 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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 JJJ]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJ]

34. (3791) 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]
35. For official 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. VOC emissions shall be reported as both methane and as propane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60, Subpart JJJJ]

36. The following methods shall be used for official source testing: NOx (ppmv) - EPA Method 7E, CO (ppmv) - EPA Method 10, VOC (ppmv) - EPA Method 25A or 25B, stack gas oxygen - EPA Method 3 or 3A. Alternative test methods as approved by EPA, ARB, and the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702 and 40 CFR 60, Subpart JJJJ]

37. 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]

38. 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]

39. The sulfur content of the digester gas used to fuel the engine shall be monitored and recorded monthly. Monitoring of the sulfur content of the digester gas shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the fuel sulfur content limit of this permit, then monthly monitoring shall resume and continue until six consecutive months of monitoring show compliance with the fuel sulfur content limit. Once compliance with the fuel sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas fuel shall not be required if the engine does not operate during that period. During the BACT determination period for NOx emissions, monitoring of the fuel sulfur content shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr. Records of the results of monitoring of the digester gas fuel sulfur content shall be maintained. [District Rule 2201]

40. 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 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]

41. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

42. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. [In-stack emission monitors may be allowed if they satisfy the standards required for portable analyzers as specified in District policies and are approved in writing by the APCO.] 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]
43. If either the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, exceed the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. During the BACT determination period for NOx, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (as N02) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rules 2201 and 4702]

44. (3212) The permittee shall update the 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 must notify the District no later than seven days after changing the I&M plan at any time. [District Rule 4702]

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

46. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, quantity of fuel used (scf) and calculated heat input (MMBtu) during commissioning period(s), the quantity of fuel used (scf) and calculated heat input (MMBtu) during normal operation, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. Quantity of fuel used shall be recorded in standard cubic feet using a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved-device. [District Rules 2201 and 4702 and 40 CFR 60, Subpart JJ]

47. (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. If 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]

48. The total combined heat input for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 185,000 MMBtu based on the higher heating value (HHV) of the fuel during any consecutive 12-month rolling period. [District Rule 2201]

49. The total combined NOx (as NO2) emissions from permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines) shall not exceed 19,999 lb during any consecutive 12-month rolling period. To demonstrate compliance with the 12-month rolling combined NOx emission limit, monthly emissions for each engine shall be calculated by multiplying the heat input (MMBtu) (based on the HHV of the fuel) of the engine during commissioning periods and normal operation during that month by the following emissions factors, as applicable: during commissioning: 2.287 lb-NOx/MMBtu; during normal operation: 0.171 lb-NOx/MMBtu. The District may approve use of an alternate emission factor to calculate NOx emissions during normal operation based on the most recently completed source test to measure NOx emissions provided that the alternate emission factor is at least as great as the emission factor determined by the source test and monthly monitoring for the period for which the emission factor will be used demonstrates compliance with the limit. The permittee shall obtain written approval from the District prior to use of alternative emission factor(s). The District may request a change to the NOx emission factor based on supporting source test data within 30 days following the receipt of the request from the permittee. [District Rule 2201]
50. For each of the following permit units: S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines), the permittee shall maintain records of the calculated NOx emissions (in lbs) from the engine for the previous month. [District Rule 2201]

51. The permittee shall compile and maintain the following records for permit units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12 (digester gas-fired IC engines): 1) the total amount of gas (scf) used in the units each month, 2) the total amount of gas (scf) used in the units during the previous 12-month rolling period, 3) the calculated total heat input (MMBtu) for the units each month, 4) the calculated total heat input (MMBtu) for the units during the previous 12-month rolling period, 5) the calculated total NOx emissions for the units each month, and 6) the calculated total NOx emissions for the units during the previous 12-month rolling period. [District Rule 2201]

52. The methane content of the digester gas used to fuel the engines shall be measured and the heating value of the digester gas shall be determined at least once every calendar quarter. Records of the measured methane content of the digester gas and calculated gas heating value shall be maintained. [District Rule 2201]

53. Records of biogas analyzer(s) installed or utilized to monitor methane, oxygen, and hydrogen sulfide shall be maintained and shall be made available for District inspection upon request. [District Rule 2201]

54. During the BACT determination period, when requested by the District, the permittee shall perform and submit a fuel analysis of the digester gas. [District Rule 2201]

55. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4702]

56. 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. Notification of construction and copies of source test results shall be submitted to EPA at the following address: Director, Air Division, U.S. Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105. [40 CFR 60, Subpart JJJJ]

57. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

58. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

59. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

60. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]
San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-7767-7-0

LEGAL OWNER OR OPERATOR: ABEC BIDART-OLD RIVER LLC
MAILING ADDRESS: C/O CALIFORNIA BIOENERGY LLC
2828 ROOUTH STREET SUITE 500
DALLAS, TX 75201-1438

LOCATION: 20400 OLD RIVER ROAD
BAKERSFIELD, CA

EQUIPMENT DESCRIPTION:
841 BHP PMSI MODEL GREENGUARD DIGESTER GAS-FIRED RICH-BURN IC ENGINE WITH EXHAUST GAS RECIRCULATION (EGR), AN ATTAINMENT TECHNOLOGIES NON-SELECTIVE CATALYTIC REDUCTION (NSCR) SYSTEM, AND AN IRON SPONGE H2S SCRUBBER (OR EQUIVALENT H2S REMOVAL SYSTEM) POWERING A 600 KW ELECTRICAL GENERATOR

CONDITIONS

1. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
2. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
3. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
5. {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]
6. {3203} This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]
7. This engine shall be fired only on digester gas. [District Rule 2201]
8. The sulfur content of the digester gas used as fuel in this engine shall not exceed 50 ppmv as H2S. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director APCO

DAVID WARNER, Director of Permit Services
S-7767-7-0, Aug 2, 2010, D:\6383 - HGR\500001 Joint Inspection Required with HGR50001

Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585
9. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]

10. (1897) 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]

11. The owner/operator shall minimize the emissions from the engine to the maximum extent possible during the commissioning period. Conditions #12 through #22 shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #23 through #45 shall apply after the commissioning period has ended. [District Rule 2201]

12. Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable operation of the reciprocating IC engine, emission control equipment, and associated electrical delivery systems. [District Rule 2201]

13. Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a reciprocating engine is first fired, whichever occurs first. The commissioning period shall terminate when the engine has completed initial performance testing, completed initial engine tuning, and the engine is available for commercial operation. The duration of the commissioning period shall not exceed 30 days and shall consist of no more than 200 hours of engine operation without the catalyst installed. [District Rule 2201]

14. No more than four of the digester gas-fired IC engines at this facility (Permit Units S-7767-1, S-7767-2, S-7767-3, S-7767-4, S-7767-5, S-7767-6, S-7767-7, S-7767-8, S-7767-9, S-7767-10, S-7767-11, and S-7767-12) shall be operated for commissioning purposes at the same time. [District Rule 2201]

15. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the engine shall be tuned to minimize emissions. [District Rule 2201]

16. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Non-Selective Catalytic Reduction (NSCR) system shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

17. The permittee shall submit a plan to the District at least two weeks prior to the first firing of this engine unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but are not limited to, the tuning of the engine, the installation and operation of the NSCR system, the installation, calibration, and testing of emissions monitors, and any activities requiring the firing of this unit without abatement by the NSCR system. [District Rule 2201]

18. Emission rates from this engine unit during the commissioning period shall not exceed any of the following limits: 8.0 g-NOx/bhp-hr, 0.07 g-PM10/bhp-hr, 8.0 g-CO/bhp-hr, 0.41 g-VOC/bhp-hr. [District Rule 2201]

19. The permittee shall record total operating time of the engine in hours and total amount of gas (scf) used by the engine during the commissioning period. [District Rule 2201]

20. The total number of firing hours of this unit without abatement of emissions by the NSCR system shall not exceed 200 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the NSCR system. Upon completion of these activities, the permittee shall provide written notice to the District and the unused balance of the 200 firing hours without abatement shall expire. [District Rule 2201]

21. The total heat input of the engine during the commissioning period and total mass emissions of NOx that are emitted during the commissioning period shall accrue towards the consecutive twelve month limits specified in conditions #48 and #49. [District Rule 2201]

22. Coincident with the end of the commissioning period, emissions from this unit shall comply with the emission limits specified in conditions #23 and #24 below. [District Rule 2201]
23. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 212 ppmvd CO @ 15% O2), 0.15 g-VOC/bhp-hr (= 32 ppmvd VOC as methane @ 15% O2), 0.07 g-PM10/bhp-hr. [District Rules 2201 and 4702]

24. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr but not exceeding 0.60 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx from this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer in accordance with District Rule 2201 and the District's BACT policy, after at least six months of operating history and a successful compliance source test. After receipt of a written request from the applicant, the BACT determination period may be extended to up to 24 months after initial startup. [District Rule 2201]

25. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr after the BACT determination period, the permittee shall have 60 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner as to minimize NOx emissions and a detailed analysis of all factors that prohibit compliance with the NOx emissions limit. In the report, the permittee may also propose a final BACT emission limit for NOx for inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit may be shared with other technical experts so their input can be considered when determining the final BACT limit for NOx that can be consistently achieved. [District Rule 2201]

26. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise the applicable limit contained in the permit within 60 days of the successful completion of the BACT determination period or receipt of the report from the permittee. Within 30 days of receipt of the District's determination, the permittee shall submit an Authority to Construct application to incorporate the revised emissions limit(s). In no case shall the final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). If NOx emissions do not exceed 0.60 g-NOx/bhp-hr, the engine shall be allowed to continue to operate after the BACT evaluation period has ended and before the new Authority to Construct permit has been issued. [District Rule 2201]

27. If the engine demonstrates reasonably reliable compliance with the 0.15 g/bhp-hr NOx emissions limit during the BACT evaluation period, this limit shall be deemed BACT for the installation. [District Rule 2201]

28. The temperature of the NSCR catalyst shall be maintained within the range for the highest efficiency for NOx reduction as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

29. The outlet temperature of the NSCR catalyst shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

30. The NSCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

31. 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]

32. For monitoring purposes, source testing to measure NOx and CO emissions from this unit shall be conducted within 90 days of initial start-up using methods and procedures approved by the District. Official source testing to demonstrate compliance with NOx, CO, and VOC emissions limits from this unit shall be conducted within 365 days of initial start-up. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

33. Source testing to measure NOx, CO, and VOC emissions from this unit shall be conducted at least once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 1081, 2201, and 4702 and 40 CFR 60, Subpart JJJJ]

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]