

September 14, 2021

Steve Bommelje  
Provost & Pritchard  
130 N Garden St  
Visalia, CA 93291

**Re: Notice of Preliminary Decision - Authority to Construct**  
**Facility Number: N-9354**  
**Project Number: N-1170108**

Dear Mr. Bommelje:

Enclosed for your review and comment is the District's analysis of VS Digester's application for an Authority to Construct for the installation of a renewable natural gas production operation consisting of a digester system served by a backup flare, a digester gas upgrading operation served by a regenerative thermal oxidizer, and three 770 bhp natural gas-fired IC engines, at 13749 Murphy Rd, Escalon.

The notice of preliminary decision for this project has been posted on the District's website ([www.valleyair.org](http://www.valleyair.org)). After addressing all comments made during the 30-day public notice period, the District intends to issue the Authority to Construct. Please submit your written comments on this project within the 30-day public comment period, as specified in the enclosed public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Jesse A. Garcia of Permit Services at (559) 230-5918.

Sincerely,



Brian Clements  
Director of Permit Services

BC:jag

Enclosures

cc: Courtney Graham, CARB (w/ enclosure) via email

**Samir Sheikh**  
Executive Director/Air Pollution Control Officer

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# San Joaquin Valley Air Pollution Control District

## Authority to Construct Application Review

Digester System with Backup Flare, RTO and Digester Gas Upgrading Operation and  
Three Natural Gas-Fired IC Engines

Facility Name: VS Digester LLC

Date: September 14, 2021

Mailing Address: 1588 N Batavia St, Ste 1C  
Orange, CA 92867

Engineer: Jesse A. Garcia

Lead Engineer: Jerry Sandhu

Contact Person: Steve Bommelje

Telephone: (559) 636-1166

E-Mail: sbommelje@ppeng.com

Application #s: N-9354-1-0, -2-0, -3-0, -4-0

Project #: N-1170108

Deemed Complete: February 17, 2021

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### I. Proposal

VS Digester LLC has requested Authority to Construct (ATC) permits to construct a digester system (N-9354-1-0), three natural gas-fired IC engines (N-9354-2-0, -3-0, and -4-0), and a permit exempt manure drying operation (See Rule 2020 Compliance section for additional details).

The digester system consists of two covered digester lagoons, a hydrolyzer to combine and homogenize the feedstock, a digester gas-fired backup flare, a digester gas upgrading system, and permit exempt boilers that are fired on natural gas and have a maximum heat input less than 5.0 MMBtu/hr (ATC N-9354-1-0). The captured digester gas from the digester system will be treated and purified onsite to pipeline quality renewable natural gas (RNG) in the proposed digester gas upgrading operation consisting of feed gas blowers, compressors, coolers, chillers, iron sponge H<sub>2</sub>S removal, a membrane CO<sub>2</sub> removal system, and product gas compressors served by a regenerative thermal oxidizer (RTO). Lastly, the facility is proposing to install three 770 bhp natural gas-fired IC engines powering electrical generators (ATCs N-9354-2-0, -3-0, -4-0) that will provide heat and electricity for the digester system.

The proposed digester system, upgrading operation and IC engines will be constructed on open land leased from an existing dairy, Vander Schaaf Dairy #3 (N-5768), and will receive liquid manure from the dairy. The two digester lagoons are newly constructed and will receive liquid manure from Vander Schaaf Dairy #3. Vander Schaaf Dairy #3's liquid manure system otherwise operates independently from the proposed digester system. Therefore, the liquid manure system is not being modified and an ATC is not required for Vander Schaaf Dairy #3. The digester system will capture methane produced from the liquid manure and will send it to the digester gas upgrading operation that will be built next to the new digester system. The

collected digester gas will be upgraded to pipeline quality RNG for injection into the PG&E statewide grid for delivery to the end users via a point of pipeline interconnection.

VS Digester LLC and Vander Schaaf Dairy #3 are separate companies that will work together for the construction and operation of the proposed project. VS Digester LLC has indicated that the dairy and the digester facility will be separately owned and operate as separate businesses. The following is a summary of the information provided by the applicant. The proposed digester system, digester gas upgrading operation, and IC engines will be owned, installed, operated, maintained, and repaired if necessary by VS Digester 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 local water quality regulations. VS Digester LLC will not be involved in the dairy’s primary activity, the production of milk. VS Digester LLC will be solely responsible for ensuring that the digester system, digester gas upgrading operation, and IC engines comply with all applicable air quality regulations. Because the dairy at the site will be separately owned and operated from the proposed digester system, upgrading operation, and IC engines and will have different two-digit Standard Industrial Classification (SIC) codes (Industry Group 02: Agricultural Production – Livestocks and Animal Specialties for the dairy vs. Industry Group 49: Electric, Gas, And Sanitary Services for the digester system and proposed equipment in this project), pursuant to Section 3.39 of District Rule 2201, the proposed equipment will not be part of the dairy agricultural stationary source. Therefore, the proposed operation and equipment will be permitted as a separate non-agricultural stationary source (Facility N-9354).

**II. Applicable Rules**

Rule 2020	Exemptions (12/18/14)
Rule 2201	New and Modified Stationary Source Review Rule (8/15/19)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (8/15/19)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4002	National Emissions Standards for Hazardous Air Pollutants (5/20/04)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4201	Particulate Matter Concentration (12/17/92)
Rule 4301	Fuel Burning Equipment (12/17/92)
Rule 4311	Flares (12/17/20)
Rule 4701	Internal Combustion Engines – Phase 1 (8/21/03)
Rule 4702	Internal Combustion Engines (11/14/13)
Rule 4801	Sulfur Compounds (12/17/92)
CH&SC 41700	Health Risk Assessment
CH&SC 42301.6	School Notice

Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)  
 California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA  
 Guidelines

### III. Project Location

The facility is located at 13775 Murphy Rd in Escalon, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

### IV. Process Description

#### N-9354-1-0 (Digester System)

A digester is a sealed basin or tank that is designed to accelerate and control the decomposition of organic matter by microorganisms in the absence of oxygen. Anaerobic decomposition results in the conversion of organic compounds in the substrate into methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), and water rather than intermediate Volatile Organic Compounds (VOCs). The gas generated by this process is known as biogas, waste gas, or digester gas. In addition to methane and carbon dioxide, biogas may also contain small amounts of Nitrogen (N<sub>2</sub>), Oxygen (O<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), and Ammonia (NH<sub>3</sub>). Digester gas may also include trace amounts of various VOCs that remain from incomplete digestion of the volatile solids in the incoming substrate. Because digester gas is mostly composed of methane, the main component of natural gas, the gas produced in the digester can be cleaned to remove H<sub>2</sub>S and other impurities and used as fuel.

The proposed digester system will be designed to process the manure generated by the cattle at Vander Schaaf Dairy #3 and will capture fugitive methane that is currently being released from the uncovered lagoon and storage ponds at the dairy. The manure will be flushed from the milking parlor and the cow housing areas at the dairy and the manure will be pumped via an underground piping system to a hydrolyzer where the waste stream will be adjusted to the proper solids content (9-15% solids) and then pumped into the new digester system. Excess manure liquid from the reception pits will be sent to a separated liquids pit where the liquid will be available for the dairy to use in the flush system. The effluent from the digester will be pumped to a solids separation area where the fibrous solids will be separated from the liquid digester effluent. After the fibrous solids have been separated, the liquid digester effluent will be pumped back to the separated liquids pit to be used in the flush system. Excess liquid from the separated liquids pit will flow to the existing dairy storage ponds to be used to fertilize adjacent cropland.

The effluent leaving the digester will be sent to a solids separation area where it will be pumped over a two stage slope screen separator for separation of the digested manure fiber solids from the liquid. The digested solids will be returned to the dairy for use as bedding for the cattle at the dairy or stored for use as a soil amendment. The liquid effluent from the mechanical separators will be directed to the separated liquids pit for reuse in the dairy flush system. The existing dairy storage ponds will be utilized for capture of any overflow from the separated liquids. The dairy will continue to use the existing storage ponds to irrigate and fertilize adjacent cropland.

#### N-9354-2-0, -3-0, -4-0 (Natural Gas-Fired IC Engines)

The project location will include a mechanical building next to the proposed digester to house the three proposed 770 bhp lean-burn natural gas-fired IC engines. Each engine will be

equipped with an SCR system and a heat exchanger, and will power a 550 kW electrical generator. Heat will be recovered from the engines using the heat exchangers and will be used to heat the digesters.

The maximum operating schedule for the IC engines is 24 hr/day and 365 days/year.

## **V. Equipment Listing**

N-9354-1-0: DIGESTER SYSTEM CONSISTING OF TWO COVERED DIGESTER LAGOONS, ONE LAGOON, ONE HYDROLYZER, ONE 37.468 MMBTU/HR DIGESTER GAS-FIRED BACKUP FLARE, PERMIT EXEMPT BOILERS (NATURAL GAS-FIRED, 5 MMBTU/HR OR LESS), AND A DIGESTER GAS UPGRADING OPERATION CONSISTING OF FEED GAS BLOWERS, COMPRESSORS, COOLERS, CHILLERS, IRON SPONGE H<sub>2</sub>S REMOVAL, A MEMBRANE CO<sub>2</sub> REMOVAL SYSTEM, PRODUCT GAS COMPRESSORS, AND A 1.25 MMBTU/HR TRITON 4.95 NATURAL GAS-FIRED REGENERATIVE THERMAL OXIDIZER (RTO)

N-9354-2-0: 770 BHP 2G ENERGY MODEL AVUS 500PLUS NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR AND PROVIDING HEAT FOR THE DIGESTER SYSTEM PERMITTED UNDER N-9354-1

N-9354-3-0: 770 BHP 2G ENERGY MODEL AVUS 500PLUS NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR AND PROVIDING HEAT FOR THE DIGESTER SYSTEM PERMITTED UNDER N-9354-1

N-9354-4-0: 770 BHP 2G ENERGY MODEL AVUS 500PLUS NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR AND PROVIDING HEAT FOR THE DIGESTER SYSTEM PERMITTED UNDER N-9354-1

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

### N-9354-1-0

#### Digester System

As previously discussed, a digester system is a sealed basin or tank that is designed to accelerate and control the decomposition of organic matter by microorganisms in the absence of oxygen. Anaerobic digestion results in greater conversion of organic compounds in the substrate into methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), and water rather than intermediate Volatile Organic Compounds (VOCs). Because construction of the digester system will allow the liquid manure to be anaerobically treated as opposed to being processed through an open lagoon,

construction of the digester is expected to reduce VOC emissions from the dairy's liquid manure handling system.

Moisture as well as other impurities, such as CO<sub>2</sub>, H<sub>2</sub>S, and NH<sub>3</sub> will be removed from the digester gas via the digester gas upgrading equipment to upgrade the gas to pipeline quality renewable natural gas to be shipped offsite and used elsewhere.

Under normal operation, digesters are assumed to capture 100% of the produced digester gas which is upgraded into RNG to be transported offsite. If produced digester gas cannot be upgraded and transported offsite, the excess gas will be vented to the backup/emergency flare for VOC control. Additionally, digester gas upgrading equipment will be served by an RTO for VOC and H<sub>2</sub>S control.

The flare and RTO are considered emissions control devices and the products of combustion, which includes oxides of nitrogen (NO<sub>x</sub>), oxides of sulfur (SO<sub>x</sub>), particulate matter less than 10 microns (PM<sub>10</sub>) and less than 2.5 microns (PM<sub>2.5</sub>), and carbon monoxide (CO) emissions are secondary pollutants.

#### Backup/Emergency Raw Digester Gas-Fired Flare

The proposed digester system must be equipped with a backup/emergency flare as a VOC control device if there is excess digester gas that must be disposed of. There may be excess raw digester gas in cases when the gas upgrading equipment is not operating due to breakdown or maintenance. However, the flare is expected to only operate in emergency situations since gas upgrading equipment is expected to be maintained and properly operated which will serve to ensure the equipment remains reliable.

#### RTO

The proposed gas upgrading equipment will be served by an RTO as an H<sub>2</sub>S and NH<sub>3</sub> control device for the waste tail gas. In the gas upgrading operation, the portion of the raw digester gas that is not primarily methane, the gas of interest, is separated and is called the waste tail gas. The applicant proposes to dispose of this gas after it is combusted in the RTO.

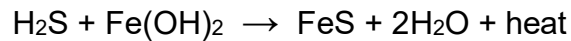
#### Fugitive Emissions

Previous analyses of digester gas have consistently demonstrated that the VOC content of digester gas is very low (less than 1% by weight). District Policy SSP 2015 – Procedures for Quantifying Fugitive VOC Emissions at Petroleum and SOCMI (Synthetic Organic Chemical Manufacturing Industry) Facilities specifies that fugitive VOC emissions are not assessed for piping and components handling fluid streams with a VOC content of 10% or less by weight. Therefore, because of the very low VOC content of the digester gas, fugitive VOC emissions from the digester system and associated equipment are assumed to be negligible, consistent with District Policy SSP 2015.

#### H<sub>2</sub>S Removal

After capture of the digester gas, it is sent through an iron sponge H<sub>2</sub>S scrubber for the removal of additional H<sub>2</sub>S prior to delivery to the gas upgrading plant.

An iron sponge scrubber is composed of vessel(s) containing iron sponge, which consists of a hydrated form of iron oxide infused onto wood shavings. The wood shavings serve only as a carrier for the iron oxide powder. The iron oxide infused into the wood surface will not wash off or migrate with the gas. As the gas passes through the iron sponge material, the H<sub>2</sub>S is removed by the following chemical reaction producing black iron sulfide and water:



For the iron sponge to perform effectively, it must be maintained within a defined range of sufficient moisture content. This requirement is typically satisfied if the gas is saturated with water vapor, as is frequently the case with biogas. If the iron sponge becomes dry, moisture can be added and it will remain effective.

The scrubber consists of enclosed vessels filled with iron sponge or other dry media for removal of H<sub>2</sub>S. The digester gas flows through the scrubber and then to a dryer and chiller to remove moisture. For continuous operation, there will be a secondary unit that will be brought online at specified times or when monitoring indicates that the primary unit is nearing saturation. Valves can be arranged so either bed can operate while the other is serviced. The useful life of the iron sponge vessels will vary depending on the inlet concentration of H<sub>2</sub>S, the flow rate, and the mass in the vessels. Before a scrubber is completely spent, it must be regenerated or replaced. The spent scrubber vessels will be sent to a regeneration facility or to an appropriate disposal facility.

### CO<sub>2</sub> Membrane

Pursuant to Newpoint Gas, LLC<sup>1</sup>, carbon dioxide membranes operate on the principle of selective permeation. Each gas component has a specific permeation rate. The rate of permeation is determined by the rate which a component dissolves into the membrane surface and the rate at which it diffuses through the membrane.

The components with higher permeation rates (such as CO<sub>2</sub>, H<sub>2</sub>, and H<sub>2</sub>S) will permeate faster through the membrane module than components with lower permeation rates (such as N<sub>2</sub>, C<sub>1</sub>, C<sub>2</sub> and heavier hydrocarbons). For example, carbon dioxide is a “fast,” more permeable, gas than methane. When a stream consisting of these two gases contacts the membrane, the carbon dioxide will permeate through the fiber at a faster rate than the methane. Thus, the feed stream is separated into a methane-rich (residual) stream on the exterior of the membrane fiber and a carbon dioxide-rich (permeate) stream on the interior of the membrane fiber.

The primary driving force of the separation is the differential partial pressure of the permeating component. Therefore, the pressure difference between the feed gas and permeate gas and the concentration of the permeating component determine the product purity and the amount of carbon dioxide membrane surface required.

This system is a closed system and the waste tail gas created in this project will be sent to be combusted in the RTO.

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<sup>1</sup> <https://www.newpointgas.com/services/carbon-dioxide-co2-removal/>

**N-9354-2-0, -3-0, -4-0 (Natural Gas-Fired IC Engines)**

The IC engines may emit NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, CO, VOC, and ammonia (NH<sub>3</sub>). The proposed engines will be equipped with the following technology:

- Turbocharger
- Intercooler
- Air/fuel ratio controller
- Lean-burn technology
- Oxidation Catalyst
- Selective catalytic reduction (SCR) with urea injection

The turbocharger reduces NO<sub>x</sub> emissions from IC engines by increasing the efficiency and promoting more complete burning of the fuel. The intercooler functions in conjunction with the turbocharger to reduce the inlet air temperature and lowering the peak combustion temperature, which reduces the formation of thermal NO<sub>x</sub>.

The air-to-fuel ratio (AFR) controller is used to monitor the amount of oxygen in the exhaust stream and adjust engine air and fuel injection to optimize engine operation and catalyst function. Lean-burn technology increases the volume of air in the combustion process compared to the volume of fuel. This technology also incorporates improved swirl patterns to promote thorough air/fuel mixing. With lower fuel content and better mixing, the combustion temperatures are lowered and the fuel is used more efficiently resulting in reduced formation of NO<sub>x</sub>.

An oxidation catalyst converts CO and VOC emissions to CO<sub>2</sub> and water. Typically, these catalysts are located prior to the urea injection site since the oxidation catalyst would otherwise convert the excess ammonia into NO<sub>x</sub>.

An SCR system reduces NO<sub>x</sub> emissions through the use of a catalyst and a reagent, in this case urea. Urea is injected into the exhaust gas stream downstream of (after) the oxidizing catalyst and upstream (prior) to the NO<sub>x</sub> catalyst and is converted to ammonia. The ammonia is used with the catalyst to reduce NO<sub>x</sub> to elemental nitrogen, water vapor, and other by-products. The use of a catalyst typically reduces the NO<sub>x</sub> emissions by up to 90%. The urea injection results in some unreacted ammonia passing through the catalyst and out to the atmosphere. This excess ammonia is known as ammonia slip. Generally, urea injection is carefully monitored and adjusted to maintain the required NO<sub>x</sub> exhaust concentration and excess ammonia is limited by the operator to reduce the cost of urea used in the system. Ammonia slip will be limited by permit condition to not exceed 10 ppmv @ 15% O<sub>2</sub>.

**VII. General Calculations****A. Assumptions****N-9354-1-0****Digester System and Upgrading Equipment:**

- VS Digester LLC (Facility N-9354) and Vander Schaaf Dairy #3 (Facility N-5768) are separate stationary sources at the same site.



- PM emissions from the handling of separated solids for the digester system are considered negligible because of the high moisture content of separated manure solids.
- All emissions from the manure processed in the digester system are allocated to the liquid manure handling system at the dairy because the manure for the digester system will be taken from the flush system at the dairy and the effluent from the digester system will be returned to the dairy for use.
- The proposed digester system will reduce potential VOC emissions from manure generated by the cattle at the dairy. Manure that is currently stored in an uncovered lagoon and ponds will instead be placed in covered digester lagoons at the VS Digester LLC facility, thereby decreasing volatilization of compounds from the manure. In the digester, most VOCs present will be converted to methane (an exempt organic compound) and carbon dioxide further reducing the potential for VOC emissions. The results of digester gas analyses have consistently demonstrated very low VOC content (less than 1% by weight). District Policy SSP 2015 specifies that fugitive VOC emissions are not assessed for piping and components handling fluid streams with a VOC content of 10% or less by weight. Therefore, consistent with District Policy SSP 2015, the VOC content of the digester gas will be limited by permit condition to no more than 10% by weight and the fugitive VOC emissions from the digester system will be assumed to be negligible.
- To streamline emission calculations, PM<sub>2.5</sub> emissions are assumed to be equal to PM<sub>10</sub> emissions.
- Digester gas properties:
  - Higher Heating Value = 580 Btu/scf (per applicant)
  - F-factor = 9,100 dscf/MMBtu (dry, adjusted to 60 °F), (Estimated based on previous digester gas fuel analyses for source tests)
  - Maximum VOC content = 0.5% by weight
  - Molar specific volume = 379.5 scf/lb-mol (at 60°F)
- Natural gas properties:
- F-factor = 8,578 dscf/MMBtu (dry, adjusted to 60 °F), per 40 CFR 60, Appendix B
- Molecular weights:
  - NO<sub>x</sub> (as NO<sub>2</sub>) = 46 lb/lb-mol
  - CO<sub>2</sub> = 44 lb/lb-mol
  - NH<sub>3</sub> = 17 lb/lb-mol
  - VOC (as CH<sub>4</sub>) = 16 lb/lb-mol
  - SO<sub>x</sub> (as SO<sub>2</sub>) = 64.06 lb/lb-mol

#### Backup flare:

- The flare is a control device and will be operated only for testing and maintenance, required regulatory purposes, backup purposes, and during emergency situations (proposed by applicant; District limitations for backup/emergency classification).
- An emergency is a situation or condition arising from a sudden and reasonably unforeseeable and unpreventable event beyond the control of the operator, such as, but not limited to, unpreventable equipment failure, natural disasters, acts of war or terrorism, and external power curtailment (except due to interruptible power service agreements). An emergency situation requires immediate corrective action to restore safe operation.

- Maximum flare gas flow rate = 64,600 scf/hr, hence maximum daily (i.e. 24-hour) flaring rate = 1.5504 MMscf/day (equivalent to 37.468 MMBtu/hr and 899.232 MMBtu/day @ 580 Btu/scf) (per applicant)
- Flaring will be limited to a maximum of 12.920 MMscf/year (equivalent to 7,493.60 MMBtu/year @ 580 Btu/scf) calculated as follows:  
Per applicant, the gas upgrading equipment will be running a majority of the time, hence flare operation shall not exceed 200 hours/year to satisfy the HRA/AAQA requirements discussed in more detail in the Rule 4102 Compliance section):  
 $200 \text{ hrs/year} \times 37.468 \text{ MMBtu/hr} = 7,493.60 \text{ MMBtu/year}$   
 $7,493.60 \text{ MMBtu/year} \div 580 \text{ Btu/scf} = 12.920 \text{ MMscf/year}$
- Flare VOC destruction efficiency = 98%.<sup>2</sup>

#### Digester Gas Upgrading Operation Served by RTO:

- Maximum waste tail gas venting rate from the CO<sub>2</sub> membrane to the RTO = 276 scfm (per applicant)
- 100% of waste tail gas vented to the RTO

#### N-9354-2-0, -3-0, -4-0 (IC Engines):

- Maximum engine operation schedule is 24 hours/day and 365 days per year.
- The maximum rated heat input for each engine is 4.627 MMBtu/hr (per engine data sheet, see Appendix F)
- Bhp to Btu/hr conversion = 2,545 Btu/bhp-hr.
- Engine thermal efficiency = 30% (District practice).
- The engines will not require any commissioning period. All emission control equipment will be installed to manufacturer specifications prior to startup.
- Ammonia slip from SCR = 10 ppmvd @ 15% O<sub>2</sub> (proposed by applicant).

### **B. Emission Factors**

#### N-9354-1-0

#### Digester System and Upgrading Equipment:

- Previous analyses of digester gas have consistently demonstrated that the VOC content of digester gas is very low (less than 1% by weight). District Policy SSP 2015 – Procedures for Quantifying Fugitive VOC Emissions at Petroleum and SOCM (Synthetic Organic Chemical Manufacturing Industry) Facilities specifies that fugitive VOC emissions are not assessed for piping and components handling fluid streams with a VOC content of 10% or less by weight. Therefore, because of the very low VOC content of the digester gas, fugitive VOC emissions from the digester system and associated equipment are assumed to be negligible, consistent with District Policy SSP 2015.

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<sup>2</sup> AP-42, Draft Section 2.4, Municipal Solid Waste Landfills, (October 2008). The value stated (97.7%) has been rounded to 98% as discussed in the BACT determination (Appendix D).

**Backup Flare**

- The NO<sub>x</sub> emission factor (0.06 lb/MMBtu) is based on the Industry Standard NO<sub>x</sub> emission factor for biogas flares<sup>3</sup> and District practice for permitting biogas flares.
- The SO<sub>x</sub> emission factor (0.35 lb/MMBtu) is based on the maximum sulfur content of the dairy digester gas proposed by the applicant (1,200 ppmv as H<sub>2</sub>S).
- The emission factors for PM (0.015 lb/MMBtu) and CO (0.046 lb/MMBtu) are based on the values given for landfill gas-fired flares in AP-42, Draft Section 2.4 Municipal Solid Waste Landfills (October 2008).
- The VOC emission factor for the digester gas-fired flare (0.006 lb/MMBtu) is based on the VOC emission for landfill gas and digester gas-fired flares (2.50 g/MMBtu or 0.0055 lb/MMBtu) from the California Air Resources Board (ARB) Low Carbon Fuel Standard (LCFS) pathways for the production of LCFS fuels from landfill gas and digester gas,<sup>4</sup> and was also assumed to be similar to the AP-42 VOC emission factor for digester gas-fired turbines (0.0058 lb/MMBtu). The assumption that the AP-42 VOC emission factor for the digester gas-fired flare is similar to digester gas-fired turbines is conservative because AP-42, Draft Section 2.4 Municipal Solid Waste Landfills (October 2008) lists a typical VOC control efficiency of 97.7% for landfill gas-fired flares compared to 94.4% for landfill gas-fired turbines and greater VOC control efficiency would result in lower VOC emissions. Additionally, as noted above, the VOC content of dairy digester gas is generally negligible to very low; therefore, using a VOC emission factor of 0.006 lb/MMBtu will result in a reasonably conservative estimate of VOC emissions from the digester gas backup flare.

<b>Emissions Factors for Backup Flare</b>			
Pollutant	lb/MMBtu	lb/scf*	Source
NO <sub>x</sub>	0.06	3.48 x 10 <sup>-5</sup>	Industry Standard/District Practice for Permitting Biogas Flares
SO <sub>x</sub>	0.35	-	1,200 ppmvd in flared gas (Proposed by Applicant, see mass balance equation below)
PM <sub>10</sub>	0.015	8.70 x 10 <sup>-6</sup>	AP-42 Draft Table 2.4.4 (October 2008) (Value for Landfill Gas Flares)
CO	0.046	2.67 x 10 <sup>-5</sup>	AP-42 Draft Table 2.4.4 (October 2008) (Value for Landfill Gas Flares)
VOC	0.006		Based on ARB LCFS Pathway Biogas Flare VOC EF/Also Conservatively Assumed to be similar to Digester Gas-Fired Turbines

\*lb/scf equivalent = lb/MMBtu x 0.000580 MMBtu/scf

<sup>3</sup> John Zink® has previously indicated that the industry standard NO<sub>x</sub> emission factor for biogas flares is 0.06 lb-NO<sub>x</sub>/MMBtu. See: John Zink (March 1998) Ultra-Low Emission Enclosed Landfill Gas Flare – A Full Scale Factory Test. Presented at the **Solid Waste Association of North America (SWANA)** 21nd Annual Landfill Gas Symposium, Austin, Texas, March 1998. [https://www.johnzinkhamworthy.com/wp-content/uploads/tp\\_UltraLowEmission.pdf](https://www.johnzinkhamworthy.com/wp-content/uploads/tp_UltraLowEmission.pdf). John Zink® also stated that one of their standard flares is expected to comply with the 0.06 lb-NO<sub>x</sub>/MMBtu emission limit when flaring low Btu gas from a digester gas refining process. See: Sacramento Metropolitan Air Quality management District (SMAQMD) BACT determination for flaring low Btu digester gas (July 25, 2017): <http://www.airquality.org/StationarySources/Documents/Flare%20Waste%20Gas%20Low%20BTU%20BACT%20140.pdf>

<sup>4</sup> Examples of ARB Low Carbon Fuel Standard (LCFS) pathways for landfill gas and digester gas are available at: [https://www.arb.ca.gov/fuels/lcfs/092309lcfs\\_lfg\\_ing.pdf](https://www.arb.ca.gov/fuels/lcfs/092309lcfs_lfg_ing.pdf) and <https://www.arb.ca.gov/fuels/lcfs/2a2b/apps/www2bm-rpt-082514.pdf> ; Also see: <https://www.arb.ca.gov/fuels/lcfs/2a2b/2a-2b-apps.htm>

$$\frac{\text{SO}_x - 1,200 \text{ ppmvd H}_2\text{S in flared gas}}{1,200 \text{ ft}^3 \text{ H}_2\text{S}} \times \frac{32.06 \text{ lb} - \text{S}}{\text{lb} - \text{mol H}_2\text{S}} \times \frac{\text{lb} - \text{mol}}{379.5 \text{ ft}^3} \times \frac{64.06 \text{ lb} - \text{SO}_2}{32.06 \text{ lb} - \text{S}} \times \frac{1 \text{ ft}^3}{580 \text{ Btu}} \times \frac{10^6 \text{ Btu}}{\text{MMBtu}} = 0.35 \frac{\text{lb} - \text{SO}_x}{\text{MMBtu}}$$

### Digester Gas Upgrading Operation

The tail-gas from the digester gas upgrading equipment has an H2S content of less than 4 ppm (equivalent to 0.0016 lb-SOx/MMBtu). Thus, worst-case SOx emissions from the RTO serving the digester gas upgrading equipment occurs when the unit is fired solely on natural gas, which has a higher emission factor of 0.00285 lb/MMBtu.

Emission Factors for Natural Gas-Fired RTO		
Pollutant	Post-Project Emission Factors (EF2)	Source
NO <sub>x</sub>	0.022 lb-NO <sub>x</sub> /MMBtu	AP-42 (07/98) Table 1.4-2
SO <sub>x</sub>	0.00285 lb-SO <sub>x</sub> /MMBtu	District Policy APR 1720
PM <sub>10</sub>	0.0075 lb-PM <sub>10</sub> /MMBtu	AP-42 (07/98) Table 1.4-2
CO	0.0824 lb-CO/MMBtu	AP-42 (07/98) Table 1.4-1
VOC	0.0054 lb-VOC/MMBtu	AP-42 (07/98) Table 1.4-2

### N-9354-2-0, -3-0, -4-0 (IC Engines):

The proposed emission limit and the equivalent limit (in lb/MMBtu) are summarized the table below.

Emission Factors for Natural Gas-Fired IC Engines			
Pollutant	Proposed limit	Equivalent Limit (lb/MMBtu)	Source
NO <sub>x</sub>	5 ppmv @ 15% O <sub>2</sub>	0.018	Applicant Proposed - SCR System
SO <sub>x</sub>	0.00285 lb/MMBtu	0.00285	District Policy APR 1720
PM <sub>10</sub>	0.01 g/bhp-hr	0.003	Manufacturer
CO	90 ppmv @ 15 %O <sub>2</sub>	0.20	Manufacturer
VOC	20 ppmv @ 15 % O <sub>2</sub>	0.025	Applicant Proposed – Oxidation Catalyst System
NH <sub>3</sub>	10 ppmv @ 15% O <sub>2</sub>	0.014	Applicant Proposed

$$\text{NO}_x: \frac{5 \text{ ppmvd} \times 8578 \frac{\text{dscf}}{\text{MMBtu}} \times 46 \frac{\text{lb}}{\text{lb-mol}} \times \frac{20.95}{20.95-15}}{379.5 \frac{\text{dscf}}{\text{lb-mol}} \times 10^6} = 0.018 \text{ lb/MMBtu}$$

$$\text{PM}_{10}: 0.01 \frac{\text{g}}{\text{bhp-hr}} \times \frac{\text{bhp-hr}}{2,545 \text{ Btu-o}} \times \frac{0.3 \text{ Btu-out}}{\text{Btu-in}} \times \frac{10^6 \text{ Btu}}{\text{MMBtu}} \times \frac{\text{lb}}{453.6 \text{ g}} = 0.003 \text{ lb/MMBtu}$$

$$\text{CO}: \frac{90 \text{ ppmvd} \times 8578 \frac{\text{dscf}}{\text{MMBtu}} \times 28 \frac{\text{lb}}{\text{lb-m}} \times \frac{20.95}{20.95-1}}{379.5 \frac{\text{dscf}}{\text{lb-m}} \times 10^6} = 0.20 \text{ lb/MMBtu}$$

$$\text{VOC}: \frac{20 \text{ ppmvd} \times 8578 \frac{\text{dscf}}{\text{MMBtu}} \times 16 \frac{\text{lb}}{\text{lb-mol}} \times \frac{20.95}{20.95-1}}{379.5 \frac{\text{dscf}}{\text{lb-mo}} \times 10^6} = 0.025 \text{ lb/MMBtu}$$

$$\text{NH}_3: \frac{10 \text{ ppmvd} \times 8578 \frac{\text{dscf}}{\text{MMBtu}} \times 17 \frac{\text{lb}}{\text{lb-mol}} \times \frac{20.95}{20.95-15}}{379.5 \frac{\text{dscf}}{\text{lb-mol}} \times 10^6} = 0.014 \text{ lb/MMBtu}$$

### C. Calculations

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

Since all the permit units in this project are new emissions units, PE1 = 0 for all pollutants for all permit units.

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

##### N-9354-1-0

##### Digester System with Backup Flare:

As explained above, the applicant has proposed to construct new covered digesters and a hydrolyzer that will have negligible fugitive emissions.

However, the backup flare serving the digester system will have emissions from combustion of the digester gas. The emissions from the backup flare are calculated with the following equations:

$$\text{Daily PE} = \text{EF (lb/MMBtu)} \times \text{Heat Input (MMBtu/hr)} \times \text{Op. Sched. (hr/day)}$$

$$\text{Annual PE} = \text{EF (lb/MMBtu)} \times \text{Annual Heat Input (MMBtu/yr)}$$

Daily PE2 for the Digester System with Backup Flare							
Pollutant	Emission Factor (lb/MMBtu)	x	Hourly Heat Input of Gas Flared (MMBtu/hr)	x	Daily Hours of Operation (hr/day)	=	Daily PE2 (lb/day)
NO <sub>x</sub>	0.06	x	37.468	x	24	=	<b>54.0</b>
SO <sub>x</sub>	0.35	x	37.468	x	24	=	<b>314.7</b>
PM <sub>10</sub>	0.015	x	37.468	x	24	=	<b>13.5</b>
CO	0.046	x	37.468	x	24	=	<b>41.4</b>
VOC	0.006	x	37.468	x	24	=	<b>5.4</b>

Annual PE2 for the Digester System with Backup Flare					
Pollutant	Emission Factor (lb/MMBtu)	x	Annual Heat Input of Gas Flared (MMBtu/yr)	=	PE2 (lb/year)
NO <sub>x</sub>	0.06	x	7,493.6	=	<b>450</b>
SO <sub>x</sub>	0.35	x	7,493.6	=	<b>2,623</b>
PM <sub>10</sub>	0.015	x	7,493.6	=	<b>112</b>
CO	0.046	x	7,493.6	=	<b>345</b>
VOC	0.006	x	7,493.6	=	<b>45</b>

Digester Gas Upgrading Operation Served by an RTO

The PE for each pollutant is calculated with the following equation:

$$PE = EF \text{ (lb/MMBtu)} \times \text{Heat Input (MMBtu/hr)} \times \text{Op. Sched. (hr/day)}$$

RTO Daily PE2							
NO <sub>x</sub>	0.022	(lb/MMBtu) x	1.25	(MMBtu/hr) x	24	(hr/day) =	0.7 (lb/day)
SO <sub>x</sub>	0.00285	(lb/MMBtu) x	1.25	(MMBtu/hr) x	24	(hr/day) =	0.1 (lb/day)
PM <sub>10</sub>	0.0075	(lb/MMBtu) x	1.25	(MMBtu/hr) x	24	(hr/day) =	0.2 (lb/day)
CO	0.0824	(lb/MMBtu) x	1.25	(MMBtu/hr) x	24	(hr/day) =	2.5 (lb/day)
VOC	0.0054	(lb/MMBtu) x	1.25	(MMBtu/hr) x	24	(hr/day) =	0.2 (lb/day)

RTO Annual PE2							
NO <sub>x</sub>	0.022	(lb/MMBtu) x	1.25	(MMBtu/hr) x	8,760	(hr/year) =	241 (lb/year)
SO <sub>x</sub>	0.00285	(lb/MMBtu) x	1.25	(MMBtu/hr) x	8,760	(hr/year) =	31 (lb/year)
PM <sub>10</sub>	0.0075	(lb/MMBtu) x	1.25	(MMBtu/hr) x	8,760	(hr/year) =	82 (lb/year)
CO	0.0824	(lb/MMBtu) x	1.25	(MMBtu/hr) x	8,760	(hr/year) =	902 (lb/year)
VOC	0.0054	(lb/MMBtu) x	1.25	(MMBtu/hr) x	8,760	(hr/year) =	59 (lb/year)

Total Emissions for N-9354-1-0

Total Daily PE Summary for N-9354-1-0			
Pollutant	Backup Flare (lb/day)	RTO (lb/day)	Total PE (lb/day)
NO <sub>x</sub>	54.0	0.7	54.7
SO <sub>x</sub>	314.7	0.1	314.8
PM <sub>10</sub>	13.5	0.2	13.7
CO	41.4	2.5	43.9
VOC	5.4	0.2	5.6

Total Annual PE Summary for N-9354-1-0			
Pollutant	Backup Flare (lb/day)	RTO (lb/day)	Total PE (lb/day)
NO <sub>x</sub>	450	241	691
SO <sub>x</sub>	2,623	31	2,654
PM <sub>10</sub>	112	82	194
CO	345	902	1,247
VOC	45	59	104

**N-9354-2-0, -3-0, -4-0 (IC Engines):**

The daily PE for each pollutant for each engine is calculated as follows:

$$PE \text{ (lb/day)} = [EF \text{ (lb/MMBtu)} \times \text{Rating (MMBtu/hr)} \times \text{Operation schedule (hrs/day)}]$$

The daily PE is summarized in the following table:

<b>Daily PE Summary – Each IC Engine</b>							
<b>Pollutant</b>	<b>Emission Factor (lb/MMBtu)</b>	<b>x</b>	<b>Rating (MMBtu/hr)</b>	<b>x</b>	<b>Op. Schedule (hrs/day)</b>	<b>=</b>	<b>PE (lb/day)</b>
NO <sub>x</sub>	0.018	x	4.627	x	24	=	2.0
SO <sub>x</sub>	0.00285	x	4.627	x	24	=	0.3
PM <sub>10</sub>	0.003	x	4.627	x	24	=	0.3
CO	0.20	x	4.627	x	24	=	22.2
VOC	0.025	x	4.627	x	24	=	2.8
NH <sub>3</sub>	0.014	x	4.627	x	24	=	1.6

The annual PE for each pollutant for each engine is calculated as follows:

$$PE \text{ (lb/year)} = [EF \text{ (lb/MMBtu)} \times \text{Rating (MMBtu/hr)} \times \text{Operation schedule (hrs/year)}]$$

The annual PE is summarized in the following table:

<b>Annual PE Summary – Each IC Engine</b>							
<b>Pollutant</b>	<b>Emission Factor (lb/MMBtu)</b>	<b>x</b>	<b>Rating (MMBtu/hr)</b>	<b>x</b>	<b>Op. Schedule (hrs/year)</b>	<b>=</b>	<b>PE (lb/year)</b>
NO <sub>x</sub>	0.018	x	4.627	x	8,760	=	730
SO <sub>x</sub>	0.00285	x	4.627	x	8,760	=	116
PM <sub>10</sub>	0.003	x	4.627	x	8,760	=	122
CO	0.20	x	4.627	x	8,760	=	8,107
VOC	0.025	x	4.627	x	8,760	=	1,013
NH <sub>3</sub>	0.014	x	4.627	x	8,760	=	567

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

Pursuant to District Rule 2201, the 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 (AER) 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 is equal to zero.

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

Pursuant to District Rule 2201, the SSPE2 is the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site.

SSPE2 (lb/year)						
Permit Unit	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC	NH <sub>3</sub>
N-9354-1-0	691	2,654	194	1,247	104	0
N-9354-2-0	730	116	122	8,107	1,013	567
N-9354-3-0	730	116	122	8,107	1,013	567
N-9354-4-0	730	116	122	8,107	1,013	567
<b>SSPE2</b>	<b>2,881</b>	<b>3,002</b>	<b>560</b>	<b>25,568</b>	<b>3,143</b>	<b>1,701</b>

#### 5. Major Source Determination

##### Rule 2201 Major Source Determination:

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

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months), pursuant to the Clean Air Act, Title 3, Section 302, US Codes 7602(j) and (z)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 70.2

Rule 2201 Major Source Determination (lb/year)						
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	VOC
SSPE1	0	0	0	0	0	0
SSPE2	2,881	3,002	560	560	25,568	3,143
Major Source Threshold	20,000	140,000	140,000	140,000	200,000	20,000
Major Source?	No	No	No	No	No	No



Note: PM2.5 assumed to be equal to PM10

As seen in the table above, the facility is not an existing Major Source and is not becoming a Major Source as a result of this project.

**Rule 2410 Major Source Determination:**

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). Therefore the PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination (tons/year)						
	NO <sub>2</sub>	VOC	SO <sub>2</sub>	CO	PM	PM <sub>10</sub>
Estimated Facility PE before Project Increase	0	0	0	0	0	0
PSD Major Source Thresholds	250	250	250	250	250	250
PSD Major Source?	No	No	No	No	No	No

As shown above, the facility is not an existing PSD major source for any regulated NSR pollutant expected to be emitted at this facility.

**6. Baseline Emissions (BE)**

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

Pursuant to District Rule 2201, BE = PE1 for:

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

otherwise,

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

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

## **7. SB 288 Major Modification**

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

Since this facility is not a major source for any of the pollutants addressed in this project, this project does not constitute an SB 288 major modification and no further discussion is required.

## **8. Federal Major Modification / New Major Source**

### **Federal Major Modification**

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

As defined in 40 CFR 51.165, Section (a)(1)(v) and part D of Title I of the CAA, a Federal Major Modification is 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. The significant net emission increase threshold for each criteria pollutant is included in Rule 2201.

Since this facility is not a Major Source for any pollutants, this project does not constitute a Federal Major Modification and no further discussion is required.

### **New Major Source**

As demonstrated above, this facility is not becoming a Major Source as a result of this project, therefore, this facility is not a New Major Source pursuant to 40 CFR 51.165 a(1)(iv)(A)(3).

## **9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination**

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination for sources located in the SJV and which are emitted in this project are: (See 52.21 (b) (23) definition of significant)

- NO<sub>2</sub> (as a primary pollutant)
- SO<sub>2</sub> (as a primary pollutant)
- CO
- PM
- PM<sub>10</sub>
- Hydrogen sulfide (H<sub>2</sub>S)
- Total reduced sulfur (including H<sub>2</sub>S)

**I. Project Emissions Increase - New Major Source Determination**

The post-project potentials to emit from all new and modified units are compared to the PSD major source thresholds to determine if the project constitutes a new major source subject to PSD requirements.

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). The PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination: Potential to Emit (tons/year)						
	NO <sub>2</sub>	VOC	SO <sub>2</sub>	CO	PM	PM <sub>10</sub>
Total PE from New and Modified Units	1.4	1.6	1.5	12.8	0.3	0.3
PSD Major Source threshold	250	250	250	250	250	250
New PSD Major Source?	No	No	No	No	No	No

As shown in the table above, the potential to emit for the project, by itself, does not exceed any PSD major source threshold. Therefore Rule 2410 is not applicable and no further analysis is required.

**10. Quarterly Net Emissions Change (QNEC)**

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

**VIII. Compliance Determination**

**Rule 2020 Exemptions**

Boilers

Pursuant to Section 6.1.1 of this Rule, a permit is not required for boilers that have a maximum heat input rating of 5.0 MMBtu/hr or less and is equipped to be fired exclusively with natural gas containing 5% by weight of hydrocarbons heavier than butane and no more than 1.0 gr-S/100 scf. Since the proposed boilers are fired solely on PUC-quality natural gas with a maximum heat input less than 5.0 MMBtu/hr, they are exempt from permitting and NSR requirements.

Manure Dryers

Additionally, pursuant to Section 6.19 of this Rule, a permit is not required for a low emitting unit which does not cause a significant health risk to the public. Section 3.10 of this Rule defines a low emitting unit as an emissions unit with an uncontrolled emissions rate of each air contaminant, less

than or equal to two pounds per day, or if greater than two pounds per day, is less than or equal to 75 pounds per year. The PE for the dryer is calculated below:

Emission Factors:

<b>Burner Emission Factors</b>		
Operation	Emission Rate	Source
Natural gas combustion in the burner	0.10 lb-NO <sub>x</sub> /MMBtu	AP-42, Table 1.4-1 & -2 (7/98)
	0.00285 lb-SO <sub>x</sub> /MMBtu	APR-1720 (12/01)
	0.0076 lb-PM <sub>10</sub> /MMBtu	AP-42, Table 1.4-1 & -2 (7/98)
	0.084 lb-CO/MMBtu	AP-42, Table 1.4-1 & -2 (7/98)
	0.0055 lb-VOC/MMBtu	AP-42, Table 1.4-1 & -2 (7/98)

Potential to Emit:

Daily PE2 from the dryer is calculated using the following equation and summarized in the table below.

$$PE2_{\text{Dryer}} (\text{lb/day}) = EF (\text{lb/MMBtu}) \times \text{Maximum Heat Input (MMBtu/day)}$$

<b>Daily PE2 Natural Gas-Fired Dryer</b>			
Pollutant	EF (lb/MMBtu)	Max Heat Input (MMBtu/day)	PE2 (lb/day)
NO <sub>x</sub>	0.1	20	2.0
SO <sub>x</sub>	0.00285	20	0.1
PM <sub>10</sub>	0.0076	20	0.2
CO	0.084	20	1.7
VOC	0.0055	20	0.1

As shown above, emissions from the dryer does not exceed two pounds per day for any air contaminant with a daily limit of 20 MMBtu/day and as shown in Appendix D, the operation does not cause a significant health impact to the public. Therefore, the dryer is exempt from permitting and NSR requirements. An exemption will be issued under a separate cover letter.

## Rule 2201 New and Modified Stationary Source Review Rule

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

#### 1. BACT Applicability

Pursuant to District Rule 2201, Section 4.1, BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions\*:

- a. Any new emissions unit with a potential to emit exceeding two pounds per day,
- b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
- c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an Adjusted Increase in Permitted Emissions (AIPE) exceeding two pounds per day, and/or
- d. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

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

#### a. New emissions units – PE > 2 lb/day

##### N-9354-1-0

##### Digester System and Backup Flare

The applicant proposes to install a digester system with a backup flare to control VOC emissions. As explained previously, fugitive emissions from the digester system are considered negligible. However, the post-control emissions will be compared to the BACT threshold of 2.0 lb/day.

The proposed backup flare will have a PE greater than 2.0 lb/day for NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>, CO, and VOC. However, the flare is an emissions control device used to control the gas from the digester system. Per Section 3.46.2 of District Rule 1020, an emissions control device is not a source operation; consequently, it does not meet the definition of an emission unit per Section 3.17 of District Rule 2201. Therefore, only emissions for the pollutant(s) which the device controls may trigger District BACT requirements. Therefore, only direct emissions from the digester system may trigger District BACT requirements, not secondary emissions from the flare (i.e. NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>, and CO). VOC emissions from the digester system controlled by the flare exceed 2.0 lb/day, therefore, BACT is triggered for the digester system with backup flare.

##### Digester Gas Upgrading Operation Served by an RTO

The applicant proposes to install a digester gas upgrading operation served by an RTO to control H<sub>2</sub>S and NH<sub>3</sub> emissions. The control device (RTO) has emissions

greater than 2.0 lb/day; however, the source operation (digester gas upgrading operation) will not have any emissions greater than 2.0 lb/day; therefore, BACT is not triggered by this source operation.

N-9354-2-0, -3-0, -4-0 (Natural Gas-Fired IC Engines)

The applicant proposes to install three natural gas-fired IC engines powering electrical generators, each with a PE greater than 2 lb/day for CO and VOC. BACT is triggered for VOC since the PE for VOC is greater than 2 lb/day. However BACT is not triggered for CO since the SSPE2 for CO is not greater than 200,000 lb/year, as demonstrated in Section VII.C.5 above.

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

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

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

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

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

As discussed in Sections VII.C.7 and VII.C.8 above, this project does not constitute an SB 288 and/or Federal Major Modification for any pollutant. Therefore BACT is not triggered for any pollutant.

**2. BACT Guideline**

Digester System and Backup Flare

BACT Guideline 5.8.12 applies to dairy manure digesters with backup/emergency flares (see Appendix B).

Natural Gas-Fired IC Engines

The District does not currently have an approved BACT Guideline for this source category. Therefore, a project-specific BACT analysis is required for the proposed 770 bhp natural gas-fired IC engines. The project-specific BACT analysis for the proposed IC engines will be based on the District's review of information that was available when the application for this project was deemed complete.

### 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.

#### Digester System and Backup Flare

Pursuant to the attached BACT Determination (see Appendix C), BACT has been satisfied with the following:

VOC: Open flare (98% control efficiency)

#### Natural Gas-Fired IC Engines

Pursuant to the attached BACT Determination (see Appendix C), BACT has been satisfied with the following:

VOC: 20 ppmv, which is demonstrated in Appendix C to be equivalent to 0.1 lb/MW-hr

## B. Offsets

### 1. Offset Applicability

Pursuant to District Rule 2201, Section 4.5, offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

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

Offset Determination (lb/year)					
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC
SSPE2	2,881	3,002	560	25,568	3,143
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets Triggered?	No	No	No	No	No

### 2. Quantity of District Offsets Required

As discussed above, the SSPE2 is not greater than the offset thresholds for all pollutants; therefore, District offsets are not triggered. In addition, as demonstrated above, this project does not trigger Federal Major Modification or New Major Source requirements.

In conclusion, offsets will not be required for this project and no further discussion is required.

## **C. Public Notification**

### **1. Applicability**

Pursuant to District Rule 2201, Section 5.4, public noticing is required for:

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

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

As shown in Section VII.C.5 above, the SSPE2 of this new facility is not greater than the Major Source threshold for any pollutant. Therefore, this new facility is not a New Major Source and public noticing for this project for New Major Source, Federal Major Modification, or SB 288 Major Modification purposes is not required.

#### **b. PE > 100 lb/day**

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. As seen in Section VII.C.2 above, this project includes a new digester system with a backup flare which has daily emissions greater than 100 lb/day for SO<sub>x</sub>, therefore public noticing for PE > 100 lb/day purposes is required.

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

Public notification is required if the pre-project Stationary Source Potential to Emit (SSPE1) is increased to a level exceeding the offset threshold levels. The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.



Offset Thresholds				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO <sub>x</sub>	0	2,881	20,000 lb/year	No
SO <sub>x</sub>	0	3,002	54,750 lb/year	No
PM <sub>10</sub>	0	560	29,200 lb/year	No
CO	0	25,568	200,000 lb/year	No
VOC	0	3,143	20,000 lb/year	No

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

**d. SSIPE > 20,000 lb/year**

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE = SSPE2 – SSPE1. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table.

SSIPE Public Notice Thresholds					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO <sub>x</sub>	2,881	0	2,881	20,000 lb/year	No
SO <sub>x</sub>	3,002	0	3,002	20,000 lb/year	No
PM <sub>10</sub>	560	0	560	20,000 lb/year	No
CO	25,568	0	25,568	20,000 lb/year	Yes
VOC	3,143	0	3,143	20,000 lb/year	No
NH <sub>3</sub>	1,701	0	1,701	20,000 lb/year	No

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

**e. Title V Significant Permit Modification**

Since this facility does not have a Title V operating permit, this change is not a Title V significant Modification, and therefore public noticing is not required.

**2. Public Notice Action**

As discussed above, public noticing is required for this project for SO<sub>x</sub> emissions in excess of 100 lb/day and an increase in CO emissions in excess 20,000 lb/year.

Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be electronically published on the District's website prior to the issuance of the ATC for this equipment.

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

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

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

##### N-9354-1-0

- {271} All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]
- The VOC content of the digester gas produced by the digester system shall not exceed 10% by weight. [District Rule 2201]
- The sulfur content of the digester gas combusted in the flare shall not exceed 1,200 ppmv as H<sub>2</sub>S. The permittee may utilize an averaging period of up to 24 hours in length for demonstration of compliance with the fuel sulfur content limit. [District Rules 2201 and 4801]
- A flame shall be present at all times whenever combustible gases are vented through the flare. [District Rules 2201 and 4311]
- The flare outlet shall be equipped with an automatic ignition system, or shall operate with a pilot flame present at all times when combustible gases are vented through the flare, except during purge periods for automatic-ignition equipped flares. [District Rules 2201 and 4311]
- The flare shall be equipped with an operational non-resettable hour meter. [District Rules 2201 and 4311]
- Unless the flare is equipped with a flow-sensing ignition system, the flare shall be equipped and operated with a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting at least one pilot flame. [District Rules 2201 and 4311]
- The flare shall be operated only for testing and maintenance, backup, and emergency purposes. [District Rule 2201]
- Flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot shall use purge gas for purging. [District Rules 2201 and 4311]
- Open flares (air-assisted, steam-assisted, or non-assisted) in which the flare gas pressure is less than 5 psig shall be operated in such a manner that meets the provisions of 40 CFR 60.18. [District Rules 2201 and 4311]

- Upon request, the operator of an open flare in which the flare gas pressure is less than 5 psig shall make available records that demonstrate compliance with the provisions of 40 CFR 60.18, (c)(3) through (c)(5). [District Rules 2201 and 4311]
- Emissions rates from the combustion of digester gas in the flare shall not exceed any of the following limits: 0.06 lb-NO<sub>x</sub>/MMBtu, 0.35 lb-SO<sub>x</sub>/MMBtu, 0.015 lb-PM<sub>10</sub>/MMBtu, 0.046 lb-CO/MMBtu, or 0.006 lb-VOC/MMBtu. [District Rule 2201]
- Only PUC quality natural gas shall be used in the RTO as supplemental fuel. [District Rules 2201 and 4801]
- The RTO shall be operated with a combustion chamber temperature of no less than 1600 degrees F and the retention time shall be no less than 0.5 seconds. [District Rule 2201]
- The RTO shall be heated to the proper operating temperature prior to introducing the contaminated air stream. [District Rules 2201 and 4104]
- Emissions from the RTO shall not exceed any of the following limits: 0.022 lb-NO<sub>x</sub>/MMBtu, 0.00285 lb-SO<sub>x</sub>/MMBtu, 0.0075 lb-PM<sub>10</sub>/MMBtu, 0.0824 lb-CO/MMBtu, or 0.0054 lb-VOC/MMBtu. [District Rule 2201]

Since the flare can operate a maximum capacity for 24 hours/day, no daily limit is required; however, since the flare's annual operation is limited, the following condition will be included as a mechanism to ensure compliance:

- The flare shall not operate for more than 200 hours per year. [District Rules 2201, 4102, and 4311]

N-9354-2-0, -3-0, -4-0

- This engine shall be fired only on PUC quality natural gas fuel. [District Rules 2201, 4702, and 4801]
- The maximum fuel consumption of this engine shall not exceed 4.627 MMBtu/hr. [District Rule 4702]
- Emissions from this IC engine shall not exceed any of the following limits: 0.018 lb-NO<sub>x</sub>/MMBtu (equivalent to 5 ppmvd NO<sub>x</sub> @ 15% O<sub>2</sub>), NO<sub>x</sub> referenced as NO<sub>2</sub>; 0.003 lb-PM<sub>10</sub>/MMBtu; 0.20 lb-CO/MMBtu (equivalent to 90 ppmvd CO @ 15% O<sub>2</sub>); or 0.025 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC @ 15% O<sub>2</sub>), VOC referenced as CH<sub>4</sub>. [District Rules 2201 and 4702]
- Ammonia (NH<sub>3</sub>) emissions from this engine shall not exceed 10 ppmvd @ 15% O<sub>2</sub>. [District Rule 2201]
- All equipment shall be maintained in good operating condition and shall be operated in a manner consistent with good air pollution control practice to minimize emissions of air contaminants. [District Rule 2201]

## E. Compliance Assurance

### 1. Source Testing

#### N-9354-1-0

Pursuant to District Policy APR 1705, source testing is required for units equipped with afterburner, thermal incinerator, or catalytic incinerator for controlling VOCs. The RTO proposed in this project is not used to control VOCs; therefore, source testing of the RTO is not required. Additionally, source testing is not required for any other unit in this operation.

#### N-9354-2-0, -3-0, -4-0

In accordance with District Policy APR 1705, source testing for NO<sub>x</sub>, CO and VOC emissions from natural gas fired IC engine served by a catalyst control system (including SCR and an oxidation catalyst) shall be conducted initially and at least once every 24 months thereafter. In addition, in order to assure compliance with the ammonia slip limit from the SCR system, source testing of the ammonia emissions will also be required initially and at least once every 24 months thereafter.

The engines are not served by any control devices for PM<sub>10</sub> emissions. Therefore, it is not expected that the PM<sub>10</sub> emissions will change much over time as long as the quality of the gas combusted in this unit remains consistent. Therefore, ongoing periodic source testing for PM<sub>10</sub> emissions will not be required.

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

- Source testing to measure NO<sub>x</sub>, CO, VOC, PM<sub>10</sub> and ammonia (NH<sub>3</sub>) emissions from this unit shall be conducted within 60 days of initial startup operation. [District Rules 1081, 2201, and 4702]
- Source testing to measure NO<sub>x</sub>, CO, VOC, and ammonia (NH<sub>3</sub>) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]
- 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 Rules 2201 and 4702]
- The results of each source test shall be submitted to the District within 60 days after completion of the source test. [District Rule 1081]
- {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]
- For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit, the test cannot

be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as methane. NO<sub>x</sub>, CO, VOC, and NH<sub>3</sub> concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rules 2201 and 4702]

- The following methods shall be used for source testing: NO<sub>x</sub> (ppmv) - EPA Method 7E or ARB Method 100; CO (ppmv) - EPA Method 10 or ARB Method 100; VOC (ppmv) - EPA Method 18, 25A or 25B, or ARB Method 100; stack gas oxygen - EPA Method 3 or 3A or ARB Method 100; stack gas velocity - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; NH<sub>3</sub> - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
- 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 NO<sub>x</sub>, CO, and O<sub>2</sub> 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]

## 2. Monitoring

### N-9354-1-0

Because of the variable content of digester gas, monitoring of the fuel sulfur content will be required. The following conditions will be placed on the permit as a mechanism to ensure compliance:

- The sulfur content of the digester gas combusted in this flare shall be monitored and recorded at least once every calendar quarter in which a digester gas sulfur content analysis is not performed. If quarterly monitoring shows a violation of the sulfur content limit of this permit, monthly monitoring will be required until six consecutive months of monitoring show compliance with the sulfur content limit. Once compliance with the 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 flared shall not be required if the flare does not operate during that period. Records of the results of monitoring of the digester gas sulfur content shall be maintained. [District Rule 2201]
- Monitoring of the digester gas sulfur content shall be performed using gas detection tubes calibrated for H<sub>2</sub>S; a Testo 350 XL portable emission monitor; a continuous fuel gas monitor that meets the requirements specified in SCAQMD Rule 431.1, Attachment A; District-approved source test methods, including EPA Method 15, ASTM Method D1072, D4084, and D5504; District-approved in-line H<sub>2</sub>S monitors; 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]

Additionally, the following condition will be placed on the permit as a mechanism to ensure compliance:

- The RTO temperature shall be monitored and recorded utilizing a continuous monitoring and recording device. The monitoring and recording device shall be maintained in proper operating condition at all times. [District Rule 2201]

N-9354-2-0, -3-0, -4-0

The proposed digester gas-fired IC engines are subject to District Rule 4702 – Internal Combustion Engines. Monitoring in compliance with Rule 4702 will satisfy monitoring for Rule 2201. Rule 4702 requires the following:

- Section 5.8.2 requires engines rated at less than 1,000 bhp to monitor operational characteristics recommended by the engine manufacturer or emission control system supplier, and approved by the APCO.
- Section 6.5.3 requires monthly monitoring for engines equipped with non-certified control devices.

Therefore, the following conditions will be included on each IC engine permit as a mechanism to enforce compliance with the monitoring requirements of Rule 2201 and Rule 4702:

- The permittee shall monitor and record the engine operating load, the SCR system reagent injection rate, the inlet temperature to the catalyst control system, and the back pressure of the exhaust upstream of the catalyst control system at least once per month. [District Rules 2201 and 4702]
- The permittee shall monitor and record the stack concentration of NO<sub>x</sub>, CO, and O<sub>2</sub> at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if two consecutive deviations are observed during quarterly monitoring. 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 if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
- The permittee shall monitor and record the stack concentration of NH<sub>3</sub> at least once every calendar quarter in which a source test is not performed. NH<sub>3</sub> monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed

within the last quarter. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 2201]

- If the NO<sub>x</sub>, CO, or NH<sub>3</sub> concentrations, as measured by the portable analyzer or the District approved ammonia monitoring equipment, 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. [District Rules 2201 and 4702]
- {modified 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 Rules 2201 and 4702]

### 3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following conditions are listed on the permit to operate:

#### N-9354-1-0

- Permittee shall maintain annual records of the operation of the flare, in hours. [District Rules 1070 and 2201]
- The sulfur content of the digester gas combusted in this flare shall be monitored and recorded at least once every calendar quarter in which a digester gas sulfur content analysis is not performed. If quarterly monitoring shows a violation of the sulfur content limit of this permit, monthly monitoring will be required until six consecutive months of monitoring show compliance with the sulfur content limit. Once compliance with the 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 flared shall not be required if the flare does not operate during that period. Records of the results of monitoring of the digester gas sulfur content shall be maintained. [District Rule 2201]

- The RTO temperature shall be monitored and recorded utilizing a continuous monitoring and recording device. The monitoring and recording device shall be maintained in proper operating condition at all times. [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. Records may be maintained and submitted in an electronic format approved by the District. [District Rules 1070, 2201, and 4311]

#### N-9354-2-0, -3-0, -4-0

- The SCR 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]
- The permittee shall maintain records of: (1) the date and time of NO<sub>x</sub>, CO, O<sub>2</sub>, and NH<sub>3</sub> measurements, (2) the O<sub>2</sub> concentration in percent and the measured NO<sub>x</sub>, CO, and NH<sub>3</sub> concentrations corrected to 15% O<sub>2</sub>, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH<sub>3</sub> emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
- The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, the type and quantity of fuel used, 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]
- 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 1070, 2201, and 4702]

#### **4. Reporting**

No reporting is required to demonstrate compliance with Rule 2201.

#### **F. Ambient Air Quality Analysis (AAQA)**

Section 4.14 of District Rule 2201 requires that an 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 District's Technical Services Division conducted the required analysis. Refer to Appendix D of this document for the AAQA summary sheet.



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

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

### **Rule 2410 Prevention of Significant Deterioration**

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

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

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

No subparts of 40 CFR Part 60 apply to digester gas-fired flares or natural gas-fired RTOs. Therefore, no discussion is required for permit unit N-9354-1. The following subpart is applicable to stationary spark ignition IC engines.

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

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

Pursuant to Section 60.4230, compliance with this subpart is required for owners and operators of stationary SI IC engines that commence construction after June 12, 2006, where the stationary SI ICE are manufactured: (a) on or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP); (b) on or after January 1, 2008, for lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP; (c) on or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or (d) on or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 KW (25 HP).

The proposed engines are 770 bhp SI IC engines that are constructed after June 12, 2006 and manufactured after January 1, 2008; therefore, the engines are subject to this subpart.

However, the District has not been delegated the authority to implement 40 CFR 60, Subpart JJJJ for non-Major Sources; therefore, the requirements from this subpart will not be included in the permit. However, the applicant will be responsible for compliance with the applicable requirements of this regulation.

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

This rule incorporates NESHAPs from Part 61, Chapter I, Subchapter C, Title 40, CFR and the NESHAPs from Part 63, Chapter I, Subchapter C, Title 40, CFR; and applies to all sources of hazardous air pollution listed in 40 CFR Part 61 or 40 CFR Part 63.

No subparts of 40 CFR Part 61 or Part 63 apply to digester gas-fired flares or natural gas-fired RTOs. Therefore, no discussion is required for permit unit N-9354-1. The following subpart is applicable to stationary spark ignition IC engines.

#### **40 CFR 63 Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)**

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.

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 with 40 CFR 60, Subpart JJJJ, the District has not been delegated the authority to implement 40 CFR 63, Subpart ZZZZ for non-Major Sources; therefore, no requirements from this subpart will be included in the permits. However, the applicant will be responsible for compliance with the applicable requirements of this regulation.

### **Rule 4101 Visible Emissions**

Rule 4101 states that no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour which is as dark as or darker than Ringelmann 1 (or 20% opacity).

Since the flare will only combust digester gas, visible emissions are not expected to exceed Ringelmann 1 or 20% opacity.

Additionally, as the RTO and the IC engines will be fired solely on natural gas fuel, visible emissions are not expected to exceed Ringelmann 1 or 20% opacity. Also, based on past District

inspections of natural gas-fired RTOs and IC engines, compliance is expected. The following condition will be listed on the permits as a mechanism to enforce compliance:

N-9354-1-0, -2-0, -3-0, -4-0:

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

### **Rule 4102 Nuisance**

Rule 4102 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. The following conditions will be included on each permit in this project as a mechanism to enforce compliance.

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

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

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

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification of an existing source shall not result in an increase in cancer risk greater than the District's significance level (20 in a million) and shall not result in acute and/or chronic risk indices greater than 1.

According to the Technical Services Memo for this project, the total facility prioritization score including this project was greater than one. Therefore, an HRA was required to determine the short-term acute and long-term chronic exposure from this project.

The resulting prioritization score, acute hazard index, chronic hazard index, and cancer risk for this project is shown below.

Health Risk Assessment Summary	
	Worst Case Potential
<b>Prioritization Score</b>	>1
<b>Cancer Risk</b>	2.26 in a million
<b>Acute Hazard Index</b>	0.16
<b>Chronic Hazard Index</b>	0.14
<b>T-BACT Required?</b>	No*

\* Although the total cancer risk is greater than 1 in a million, the cancer risk from each permit is less than 1 in a million; therefore, T-BACT is not required.

### 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.

In accordance with District policy APR 1905, no further analysis is required, and compliance with District Rule 4102 requirements is expected.

See Appendix D: Health Risk Assessment Summary

The following permit conditions are required to ensure compliance with the assumptions made for the risk management review:

N-9354-1-0, -2-0, -3-0, -4-0:

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

N-9354-1-0:

- The flare shall not operate for more than 200 hours per year. [District Rules 2201, 4102, and 4311]

### Rule 4201 Particulate Matter Concentration

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

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.

N-9354-1-0:

Digester System and Backup/Emergency Flare

For the following calculation, PM<sub>10</sub> is conservatively assumed to be 50% of PM, per Section 4.11 of Rule 2201.

$$\begin{aligned}
 PM \text{ Concentration} &= \frac{0.015 \text{ lb} - PM}{MMBtu} \times \frac{MMBtu}{9,100 \text{ dscf}} \times \frac{7,000 \text{ grain}}{\text{lb}} \\
 &= \frac{0.012 \text{ grain} - PM}{\text{dscf}} < \frac{0.1 \text{ grain} - PM}{\text{dscf}}
 \end{aligned}$$

Since 0.012 grain-PM/dscf is less than 0.1 grain-PM/dscf, the flare is expected to comply with this rule.

Natural Gas-Fired RTO

For the following calculation, PM<sub>10</sub> is conservatively assumed to be 50% of PM, per Section 4.11 of Rule 2201.

$$\begin{aligned}
 PM \text{ Concentration} &= \frac{0.0075 \text{ lb} - PM}{MMBtu} \times \frac{MMBtu}{8,578 \text{ dscf}} \times \frac{7,000 \text{ grain}}{\text{lb}} \\
 &= \frac{0.006 \text{ grain} - PM}{\text{dscf}} < \frac{0.1 \text{ grain} - PM}{\text{dscf}}
 \end{aligned}$$

Since 0.006 grain-PM/dscf is less than 0.1 grain-PM/dscf, compliance with this rule is expected.

N-9354-2-0, -3-0, -4-0 (Natural Gas-Fired IC Engines)

For the following calculation, PM<sub>10</sub> is conservatively assumed to be 50% of PM, per Section 4.11 of Rule 2201.

$$\begin{aligned}
 PM \text{ Concentration} &= \frac{0.01 \text{ g} - PM}{\text{bhp} - \text{hr}} \times \frac{\text{bhp} - \text{hr}}{2,545 \text{ Btu}} \times \frac{1E6 \text{ Btu}}{9,100 \text{ dscf}} \times \frac{0.30 \text{ Btu}_{out}}{\text{Btu}_{in}} \times \frac{15.43 \text{ grain}}{\text{g}} \\
 &= \frac{0.002 \text{ grain} - PM}{\text{dscf}} < \frac{0.1 \text{ grain} - PM}{\text{dscf}}
 \end{aligned}$$

Since 0.002 grain-PM/dscf is less than 0.1 grain-PM/dscf, compliance with this rule is expected.

The following condition will be included on each permit as a mechanism to enforce compliance:

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

## Rule 4311 Flares

The purpose of this rule to limit the emissions of volatile organic compounds (VOC), oxides of nitrogen (NO<sub>x</sub>), and sulfur oxides (SO<sub>x</sub>) from the operation of flares.

The proposed backup flare listed under ATC N-9354-1 is subject to Rule 4311. The requirements of Rule 4311 that apply to the proposed backup flare are discussed below.

### Section 5.0 - Requirements

Pursuant to Section 5.1, flares that are permitted to operate only during an emergency are not subject to the requirements of Sections 5.7, 5.8, 5.9 and 5.10. The proposed backup flare will be permitted to allow limited operation during times that are not emergencies. Therefore, this section does not apply to the proposed flare.

Pursuant to Section 5.2, flares that are operated 200 hours or less per calendar year as specified in the Permit to Operate, or with an annual throughput limit equivalent to 200 hours per year at flare rating (MMBtu/hr) as specified in the Permit to Operate, are exempt from the requirements of Sections 5.9 and 5.10 provided that one of the following two conditions are satisfied.

- 5.2.1 For the 200 hours per year validation, the operator shall use a calibrated non-resettable totalizing time meter or equivalent method approved in writing by the APCO;  
or
- 5.2.2 For the annual throughput limit equivalent to 200 hours per year validation, the operator shall use a calibrated fuel meter or equivalent method approved in writing by the APCO.

The proposed backup flare will be limited by permit condition to operating no more than 200 hours per year. Therefore, this exemption applies and the following conditions will be included as a mechanism to ensure compliance:

- The flare shall not operate for more than 200 hours per year. [District Rules 2201, 4102, and 4311]
- The flare shall be equipped with an operational non-resettable hour meter. [District Rules 2201 and 4311]

Section 5.3 requires that a flame always be present in the flare whenever combustible gases are present. The following condition will be included on the ATC as a mechanism to ensure compliance:

- A flame shall be present at all times in the flare whenever combustible gases are vented through the flare. [District Rules 2201 and 4311]

Section 5.4 requires that the flare be equipped with either an automatic ignition system or operated with a continuous pilot. Per the applicant, this unit is equipped with an automatic ignition system. The following condition will be included on the ATC as a mechanism to ensure compliance:

- The flare outlet shall be equipped with an automatic ignition system, or shall operate with a pilot flame present at all times when combustible gases are vented through the flare, except during purge periods for automatic-ignition equipped flares. [District Rules 2201 and 4311]

Section 5.5 requires that, except for flares equipped with a flow-sensing ignition system, flares must be equipped with a device to monitor and confirm operation of the pilot flame. The following condition will be included on the ATC as a mechanism to ensure compliance:

- Unless the flare is equipped with a flow-sensing ignition system, the flare shall be equipped and operated with a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting at least one pilot flame. [District Rules 2201 and 4311]

Section 5.6 requires that flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot must use purge gas for purging. The following condition will be included on the ATC as a mechanism to ensure compliance:

- Flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot shall use purge gas for purging. [District Rules 2201 and 4311]

Section 5.7 requires open flares (air-assisted, steam-assisted, or non-assisted) in which the flare gas pressure is less than 5 psig to be operated in such a manner that meets the provisions of 40 CFR 60.18. The following condition will be included on the ATC as a mechanism to ensure compliance:

- Open flares (air-assisted, steam-assisted, or non-assisted) in which the flare gas pressure is less than 5 psig shall be operated in such a manner that meets the provisions of 40 CFR 60.18. [District Rules 2201 and 4311]

Section 5.8 establishes emission limits for ground-level enclosed flares. The proposed flare is not a ground level enclosed flare. Therefore, the requirements of Section 5.7 are not applicable to the proposed flare.

As discussed above, the flare is limited to operate to no more than 200 hours per year and is exempt from Sections 5.9 and 5.10.

Section 5.11 prohibits flaring unless it is consistent with an approved flare minimization plan (FMP), pursuant to Section 6.5 or is caused by an emergency and is necessary to prevent an accident, hazard, or release of vent gas directly to the atmosphere. Section 6.5 specifies that a flare minimization plan is required for refinery flares and flares at a major source. The proposed flare is not a refinery flare and is not at a major source. Therefore, a flare minimization plan is not required and this section does not apply.

Section 5.12 establishes SO<sub>2</sub> emission reduction standards for petroleum refinery flares. The proposed flare is not a petroleum refinery flare. Therefore, this section does not apply.

Section 5.13 requires the operator of a flare subject to flare minimization requirements pursuant to Section 5.11 to monitor the vent gas flow to the flare with a flow measuring device and to maintain records pursuant to Section 6.1.7. Flares that the operator can verify, based on permit conditions, are not capable of producing reportable flare events pursuant to Section 6.2.2 shall not be required to monitor vent gas flow to the flare. As discussed above, the proposed flare is not subject to flare minimization requirements pursuant to Section 5.11. Therefore, this section does not apply.

Section 5.14 requires the operator of a flare subject to the annual throughput thresholds in Table 2 to monitor the vent gas flow rate to the flare with a flow measuring device. Flares that the operator can verify are not capable of exceeding the annual throughput thresholds are not required to monitor the vent gas flow to the flare. Since the flare is not physically capable of flaring enough gas to exceed the threshold in Table 2, this section does not apply.

Section 5.15 requires the operator of a petroleum refinery or a flare with a flaring capacity equal to or greater than 50 MMBtu/hr to monitor the flare pursuant to Sections 6.6, 6.7, 6.8, 6.9, and 6.10. The proposed flare is not a petroleum refinery flare. Therefore, this section does not apply.

#### Section 6.0 - Administrative Requirements

Section 6.1 requires the operator of a flare to maintain certain records for five years. The following conditions will be placed on the permit to ensure compliance:

- All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 2201, 4311]

Section 6.1 also states that the operator of a flare subject to this rule shall maintain the following records:

- 6.1.1 Copy of the compliance determination conducted pursuant to Section 6.4.1
- 6.1.2 Copy of the source testing result conducted pursuant to Section 6.4.2
- 6.1.3 For flares used during an emergency, record of the duration of flare operation, amount of gas burned, and the nature of the emergency situation
- 6.1.4 Operators claiming an exemption pursuant to Section 4.3 shall record annual throughput, material usage, or other information necessary to demonstrate an exemption under that section
- 6.1.5 A copy of the approved flare minimization plan pursuant to Section 6.5
- 6.1.6 Where applicable, a copy of annual reports submitted to the APCO pursuant to Section 6.2
- 6.1.7 Where applicable, monitoring data collected pursuant to Sections 5.10, 6.6, 6.7, 6.8, 6.9, and 6.10

The proposed flare is not subject to any of the sections or requirements listed above; therefore, these recordkeeping requirements are not applicable.

Section 6.2.1 requires the operator of a flare subject to flare minimization plans pursuant to Section 5.8 to notify the APCO of an unplanned flaring event within 24 hours after the start of



the next business day or within 24 hours of their discovery, whichever occurs first. As discussed above, the proposed flare is not subject to flare minimization requirements pursuant to Section 5.8. Therefore, this section does not apply.

Section 6.2.2 states that effective on and after July 1, 2012, and annually thereafter, the operator of a flare subject to flare minimization plans pursuant to Section 5.11 shall submit an annual report to the APCO that summarizes all Reportable Flaring Events as defined Section 3.0 that occurred during the previous 12 month period. As discussed above, the proposed flare is not subject to flare minimization requirements pursuant to Section 5.11. Therefore, this section does not apply.

Section 6.2.3 states that effective on and after July 1, 2012, and annually thereafter, the operator of a flare subject to flare monitoring requirements pursuant to Sections 5.13, 5.14, 6.6, 6.7, 6.8, 6.9, and 6.10, as appropriate, shall submit an annual report to the APCO within 30 days following the end of each 12 month period. The proposed flare is not a petroleum refinery flare and is not located at a major source. Therefore, the flare is not subject to the requirements of Sections 5.13, 5.14, 6.6, 6.7, 6.8, 6.9, and 6.10 and the requirements of this section are not applicable.

Section 6.3 specifies test methods to demonstrate compliance with Rule 4311. The proposed flare is not a ground level enclosed flare and is not subject the testing or monitoring requirements of this section; therefore, this section does not apply.

Section 6.4.1 requires the operator of flares that are subject to Section 5.6 to make available to the APCO upon request the compliance determination records that demonstrate compliance with the provisions of 40 CFR 60.18, (c)(3) through (c)(5). The following condition will be included on the ATC to ensure compliance with the requirements of Section 6.4.1:

- Upon request, the operator of an open flare in which the flare gas pressure is less than 5 psig shall make available records that demonstrate compliance with the provisions of 40 CFR 60.18, (c)(3) through (c)(5). [District Rules 2201 and 4311]

Section 6.4.2 requires the operator of ground-level enclosed flares, or flares subject to the emission limits in Table 3 to conduct source testing at least once every 12 months to demonstrate compliance with Section 5.8. As discussed above, the proposed flare is not a ground level enclosed flare and is not subject to the emission limits in Table 3; therefore, this section does not apply.

Section 6.5 specifies requirements for operators of flares that are subject to the flare minimization plan (FMP) provisions of District Rule 4311. As discussed above, the proposed flare is not subject to flare minimization requirements pursuant to Section 5.8. Therefore, this section does not apply.

Sections 6.6, 6.7, 6.8, 6.9, and 6.10 require additional monitoring for petroleum refinery flares and any flare located at a major source. The proposed flare is not a petroleum refinery flare and is not located at a major source. Therefore, these sections do not apply.

Compliance with the requirements of this Rule 4311 is expected.

## **Rule 4701 Internal Combustion Engines – Phase I**

### N-9354-2-0, -3-0, -4-0:

The purpose of this rule is to limit the emissions of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion (IC) engines.

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

## **Rule 4702 Internal Combustion Engines**

### N-9354-2-0, -3-0, -4-0:

The purpose of this rule is to limit the emissions of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOC), and sulfur oxides (SO<sub>x</sub>) from IC engines.

This rule applies to any internal combustion engine with a rated brake horsepower of 25 brake horsepower or greater.

Section 5.2.2.1 requires that the operator of a spark-ignited engine that is used exclusively in non-agricultural operations shall comply with Sections 5.2.2.1.1 through 5.2.2.1.3 on an engine-by-engine basis:

- 5.2.2.1.1 NO<sub>x</sub>, CO, and VOC emission limits pursuant to Table 2;
- 5.2.2.1.2 SO<sub>x</sub> control requirements of Section 5.7, pursuant to the deadlines specified in Section 7.5; and
- 5.2.2.1.3 Monitoring requirements of Section 5.10, pursuant to the deadlines specified in Section 7.5.

Section 5.2.2.2 allows that in lieu of complying with the NO<sub>x</sub> emission limit requirement of Section 5.2.2.1.1, an operator may pay an annual fee to the District. The applicant has not proposed to comply with the fee paying option allowed by this section.

Section 5.2.2.3 allows that in lieu of complying with the NO<sub>x</sub>, CO, and VOC limits of Table 2, an operator may elect to implement an alternative emission control plan (AECPP) pursuant to Section 8.0. The applicant has proposed to comply with the Table 2 emissions limits and has not proposed an AECPP.

The following table summarizes the emission limits from Table 2 of Rule 4702 that are applicable to the IC engines in this project:

<b>Rule 4702, Table 2 Emission Limits/Standards for Spark-Ignited IC Engines rated &gt;50 bhp Used in Non-Agricultural Operations</b>			
Engine Type	NOx Emission Limit (ppmv @ 15% O <sub>2</sub> , dry)	CO Emission Limit (ppmv @ 15% O <sub>2</sub> , dry)	VOC Emission Limit (ppmv @ 15% O <sub>2</sub> , dry)
2. e.Lean-Burn, Not Listed Above	11 ppmv	2,000 ppmv	750 ppmv

Since the proposed engines will be operated as part of a stationary source that is separate from the host dairy, they are non-agricultural engines. The engines are required to comply with the emission limits from Table 2, Row 2.e. The following condition will be included on each IC engine permit as a mechanism to enforce compliance with these limits:

- Emissions from this IC engine shall not exceed any of the following limits: 0.018 lb-NOx/MMBtu (equivalent to 5 ppmvd NOx @ 15% O<sub>2</sub>), NOx referenced as NO<sub>2</sub>; 0.003 lb-PM10/MMBtu; 0.20 lb-CO/MMBtu (equivalent to 90 ppmvd CO @ 15% O<sub>2</sub>); or 0.025 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC @ 15% O<sub>2</sub>), VOC referenced as CH<sub>4</sub>. [District Rules 2201 and 4702]

Section 5.2.3 contains requirements for agricultural IC engines. As stated above, the proposed engines will be operated as part of a non-agricultural stationary source. Therefore, the requirements of Section 5.2.3 are not applicable.

Section 5.2.4 contains requirements for certified compression-ignited IC engines. The engines in this project are spark-ignited IC engines. Therefore, the requirements of Section 5.2.4 are not applicable.

Section 5.3 contains requirements for continuous emission monitoring systems (CEMS) emissions measurements. The applicant has proposed APCO-approved alternate emissions monitoring for the engines in this project; therefore, the engines will not be equipped with CEMS and Section 5.3 is not applicable.

Sections 5.4 and 5.5 contain requirements for engines that will use percent emission reductions to comply with the NO<sub>x</sub> emission limits of Section 5.2. The proposed engines will not use percent emission reductions for compliance; therefore, Sections 5.4 and 5.5 are not applicable.

Section 5.6 specifies procedures for compliance with the fee paying option. The proposed engines will not utilize the fee paying option for compliance; therefore, Section 5.6 is not applicable.

Section 5.7 requires that on and after the compliance schedule specified in Section 7.5, operators of non-agricultural spark-ignited engines and non-agricultural compression-ignited engines shall comply shall comply with Sections 5.7.1, 5.7.2, 5.7.3, 5.7.4, 5.7.5, or 5.7.6:

- 5.7.1 Operate the engine exclusively on PUC-quality natural gas, commercial propane, butane, or liquefied petroleum gas, or a combination of such gases; or

- 5.7.2 Limit gaseous fuel sulfur content to no more than five (5) grains of total sulfur per one hundred (100) standard cubic feet; or
- 5.7.3 Use California Reformulated Gasoline for gasoline-fired spark-ignited engines; or
- 5.7.4 Use California Reformulated Diesel for compression-ignited engines; or
- 5.7.5 Operate the engine on liquid fuel that contains no more than 15 ppm sulfur, as determined by the test method specified in Section 6.4.6; or
- 5.7.6 Install and properly operate an emission control system that reduces SO<sub>2</sub> emissions by at least 95% by weight as determined by the test method specified in Section 6.4.6.

The proposed engines will be fired exclusively on PUC-quality natural gas. The following condition will be included on each IC engine permit as a mechanism to enforce compliance:

- This engine shall be fired only on PUC quality natural gas fuel. [District Rules 2201 and 4702]

Section 5.8 requires that the operator of a non-agricultural spark-ignited IC engine subject to the requirements of Section 5.2 or any engine subject to the requirements of Section 8.0 shall comply with the following requirements of Sections 5.8.1 through 5.8.11.

Section 5.8.2 requires engines rated at less than 1,000 bhp to monitor operational characteristics recommended by the engine manufacturer or emission control system supplier, and approved by the APCO. Additionally, the engines are subject to section 6.5.3 which requires monthly monitoring for engines equipped with non-certified control devices. Compliance with this section is demonstrated with compliance with section 6.5.3 as established further in this document.

Section 5.8.3 requires that for each engine with an alternative monitoring system, the operator shall submit to, and receive approval from the APCO, adequate verification of the alternative monitoring system's acceptability. The applicant has proposed to utilize a pre-approved alternate emissions monitoring plan for each engine; therefore, the requirements of Section 5.8.3 are satisfied.

Section 5.8.4 contains requirements for the operation of a CEMS. The proposed engines will not be equipped with CEMS; therefore, the requirements of Section 5.8.4 are not applicable.

Section 5.8.5 requires that each engine have the data gathering and retrieval capabilities of an installed monitoring system described in Section 5.8 approved by the APCO. As previously stated, the proposed engine will use a pre-approved alternate emissions monitoring plan. Therefore, the requirements of Section 5.8.5 are satisfied.

Section 5.8.6 requires that for each non-agricultural spark-ignited IC engine, the operator shall install and operate a nonresettable elapsed operating time meter. In lieu of installing a nonresettable time meter, the operator may use an alternative device, method, or technique in determining operating time provided that the alternative is approved by the APCO. The operator shall maintain and operate the required meter in accordance with the manufacturer's instructions. Each proposed engine will be equipped with a nonresettable elapsed operating time meter. The following condition will be included on each IC engine permit as a mechanism to enforce compliance:

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

Section 5.8.7 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.

Section 5.8.8 requires that for each engine, the permittee shall collect data through the I&M plan in a form approved by the APCO.

Section 5.8.9 requires for each non-agricultural spark-ignited IC engine, the permittee shall use a portable NOx analyzer to take NOx emission readings to verify compliance with the emission requirements of Section 5.2 or Section 8.0 during each calendar quarter in which a source test is not performed. If an engine is operated less than 120 calendar days per calendar year, the operator shall take one NOx emission reading during the calendar year in which a source test is not performed and the engine is operated. 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 or Permit-Exempt Equipment Registration. 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.

The following conditions will be included on each IC engine permit as a mechanism to enforce compliance:

- The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if two consecutive deviations are observed during quarterly monitoring. 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 if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
- {modified 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 Rules 2201 and 4702]

Section 5.8.10 specifies requirements for APCO approval of an alternative monitoring system. The applicant has proposed to utilize a pre-approved alternate monitoring system; therefore, Section 5.8.10 is not applicable.

Section 5.8.11 contains requirements for engines utilizing an Alternate Emission Control Plan (AECP). The proposed engines are not subject to an AECP; therefore, the requirements of Section 5.8.11 are not applicable.

Section 5.9 specifies monitoring requirements for all other engines that are not subject to the requirements of Section 5.8. The proposed engines are subject to the requirements of Section 5.8; therefore, the requirements of Section 5.9 are not applicable.

Section 5.10 specifies SO<sub>x</sub> Emissions Monitoring Requirements. An operator of a non-agricultural IC engine shall comply with the following requirements:

- 5.10.1 An operator of an engine complying with Sections 5.7.2 or 5.7.5 shall perform an annual sulfur fuel analysis in accordance with the test methods in Section 6.4. The operator shall keep the records of the fuel analysis and shall provide it to the District upon request,
- 5.10.2 An operator of an engine complying with Section 5.7.6 by installing and operating a control device with at least 95% by weight SO<sub>x</sub> reduction efficiency shall submit for approval by the APCO the proposed the key system operating parameters and frequency of the monitoring and recording not later than July 1, 2013, and
- 5.10.3 An operator of an engine complying with Section 5.7.6 shall perform an annual source test unless a more frequent sampling and reporting period is included in the Permit-to-Operate. Source tests shall be performed in accordance with the test methods in Section 6.4.

Since the engines are not complying with this Rule through Sections 5.7.2, 5.7.5 or 5.7.6, Section 5.10 is not applicable.

Section 5.11 contains requirements for engines that are not required to have a Permit to Operate pursuant to California Health and Safety Code Section 42301.16. The proposed engines are required to have a PTO; therefore, Section 5.11 are not applicable.

Section 6.1 requires that the operator of an engine subject to the requirements of Rule 4702 shall submit to the APCO an approvable emission control plan (ECP) of all actions to be taken to satisfy the emission requirements of Section 5.2 and the compliance schedules of Section 7.0. With the submittal of the complete ATC application, the requirement for an approvable ECP are satisfied.

Section 6.2.1 requires that the operator of an engine subject to the requirements of Section 5.2 shall maintain an engine operating log to demonstrate compliance with Rule 4702. 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:

- 6.2.1.1 Total hours of operation,
- 6.2.1.2 Type of fuel used,
- 6.2.1.3 Maintenance or modifications performed,
- 6.2.1.4 Monitoring data,
- 6.2.1.5 Compliance source test results, and
- 6.2.1.6 Any other information necessary to demonstrate compliance with this rule.
- 6.2.1.7 For an engine subject to Section 8.0, the quantity (cubic feet of gas or gallons of liquid) of fuel used on a daily basis.

The following condition will be included on each IC engine permit as a mechanism to enforce 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, the type of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rules 2201 and 4702]
- The permittee shall monitor and record the stack concentration of NO<sub>x</sub>, CO, and O<sub>2</sub> at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if two consecutive deviations are observed during quarterly monitoring. 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 if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

Section 6.2.2 requires that the data collected pursuant to the requirements of Section 5.8 and Section 5.9 shall be maintained for at least five years, shall be readily available, and made available to the APCO upon request. The following condition will be included on each IC engine permit as a mechanism to enforce 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 1070, 2201, 4311, and 4702]

Section 6.2.3 contains requirements for operators that claim an exemption under Section 4.2 or Section 4.3. There are no applicable exemption criteria for the IC engines in this project; therefore, Section 6.2.3 is not applicable.

Section 6.3 requires that the operator of an engine subject to the emission limits in Section 5.2 or the requirements of Section 8.2, shall comply with compliance testing requirements. Section 6.3.1 specifies that the requirements of Section 6.3.2 through Section 6.3.4 shall apply to the following engines:

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

Section 6.3.2 requires demonstration of compliance with applicable limits, ppmv or percent reduction, in accordance with the test methods in Section 6.4, as specified below:

- 6.3.2.1 By the applicable date specified in Section 5.2, and at least once every 24 months thereafter, except for an engine subject to Section 6.3.2.2.
- 6.3.2.2 By the applicable date specified in Section 5.2 and at least once every 60 months thereafter, for an agricultural spark-ignited engine that has been retro-fitted with a catalytic emission control device.
- 6.3.2.3 A portable NOx analyzer may be used to show initial compliance with the applicable limits/standards in Section 5.2 for agricultural spark-ignited engines, provided the criteria specified in Sections 6.3.2.3.1 to 6.3.2.3.5 are met, and a source test is conducted in accordance with Section 6.3.2 within 12 months from the required compliance date.

The following conditions will be included on each IC engine permit as a mechanism to enforce compliance:

- Source testing to measure NOx, CO, VOC, PM10, and ammonia (NH3) emissions from this unit shall be conducted within 60 days of initial startup operation. [District Rules 1081, 2201, and 4702]
- Source testing to measure NOx, CO, and ammonia (NH3) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]

Section 6.3.3 requires the operator to 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 6.3.2 for the purpose of determining compliance with an applicable standard or numerical limitation, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC shall be reported as methane. VOC, NOx, and CO concentrations shall be reported in ppmv, corrected to 15 percent oxygen. The following conditions will be included on each IC engine permit as a mechanism to enforce compliance:

- 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 Rules 2201 and 4702]
- For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as



methane, NO<sub>x</sub>, CO, VOC, and NH<sub>3</sub> concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rules 2201 and 4702]

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

Section 6.3.5 specifies requirements for engines that are limited by Permit-to-Operate condition to be fueled exclusively with PUC quality natural gas. Since the proposed engines will be required to be fired exclusively with PUC quality natural gas will not have such a limit.

Section 6.3.6 specifies requirements for spark-ignited engines for testing a unit or units that represent a specified group of units, in lieu of compliance with the applicable requirements of Section 6.3.2. This project includes 3 identical IC engines. The applicant has not proposed representative testing for the proposed engines. Therefore, Section 6.3.6 is not applicable.

Section 6.4 specifies source testing procedures for compliance testing. The following conditions will be included on each IC engine permit as a mechanism to enforce compliance:

- The following methods shall be used for source testing: NO<sub>x</sub> (ppmv) - EPA Method 7E or ARB Method 100; CO (ppmv) - EPA Method 10 or ARB Method 100; VOC (ppmv) - EPA Method 18, 25A or 25B, or ARB Method 100; stack gas oxygen - EPA Method 3 or 3A or ARB Method 100; stack gas velocity - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; PM<sub>10</sub> (filterable and condensable) - EPA Method 201 and 202, or ARB Method 5 in combination with Method 501; NH<sub>3</sub> - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 2201, and 4702]

Section 6.5 requires that the operator of an engine that is subject to the requirements of Section 5.2 or the requirements of Section 8.0 shall submit to the APCO for approval, an Inspection & Maintenance (I&M) plan that specifies all actions to be taken to satisfy the requirements of Sections 6.5.1 through Section 6.5.9 and the requirements of Section 5.8. Section 6.5.1 specifies that the I&M plan requirements of Sections 6.5.2 through Section 6.5.9 shall apply to the following engines:

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

The proposed engines will be equipped with an SCR system for control of NO<sub>x</sub> and oxidation catalyst for control of CO and VOC. Therefore, the requirements of Sections 6.5.2 through 6.5.9 are applicable to the engines.

Section 6.5.2 specifies procedures requiring the 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 in the I&M plan.

Each proposed engine will be equipped with an SCR system for the control of NO<sub>x</sub> emissions and an oxidation catalyst for the control of CO and VOC emissions. The applicant has proposed the following alternate monitoring program to ensure compliance with Sections 6.5.2 and 6.5.3 of the Rule:

#### Alternate Monitoring: NO<sub>x</sub> Emissions

In order to satisfy the I&M requirements for NO<sub>x</sub> emissions, the applicant has proposed to perform the following:

1. Measurement of NO<sub>x</sub> emissions concentrations with a portable analyzer at least once every calendar quarter.
2. To ensure that NO<sub>x</sub> emissions concentrations are not being exceeded between periodic NO<sub>x</sub> portable analyzer measurements, the applicant is proposing to determine a correlation between the SCR system's reagent injection rate and the catalyst control system inlet exhaust temperature and NO<sub>x</sub> emissions. The appropriate ranges for each operating load will be established during performance testing and will be monitored at least once per month.

#### Alternate Monitoring: CO and VOC Emissions

In order to satisfy the I&M requirements for CO and VOC emissions, the applicant has proposed to perform the following:

1. Measurement of CO emissions concentrations with a portable analyzer at least once every calendar quarter. Generally, if the oxidation catalyst is controlling CO emissions, it should also be achieving the desired removal efficiency for VOC emissions. Therefore, no additional monitoring for VOC emissions is required.
2. To ensure that CO and VOC emissions concentrations are not being exceeded between periodic CO emissions concentration measurements, the applicant is proposing to determine a correlation between the catalyst control system inlet exhaust temperature and back pressure and CO emissions. The appropriate ranges for each operating load will be established during performance testing and will be monitored at least once per month.

Section 6.5.4 requires procedures for the corrective actions on the noncompliant parameter(s) that the operator will take when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO<sub>x</sub>, CO, VOC, or oxygen concentrations.

Section 6.5.5 requires procedures for the operator to notify the APCO when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO<sub>x</sub>, CO, VOC, or oxygen concentrations.

The applicant has proposed that the alternate monitoring program will ensure compliance with Sections 6.5.3, 6.5.4, and 6.5.5. The following conditions will be included on each IC engine permit as a mechanism to enforce compliance:

- During initial performance testing, and during subsequent performance tests as needed, the SCR system reagent injection rate shall be monitored to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the NO<sub>x</sub> emissions limit(s) stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). Records of the acceptable SCR system reagent injection rate(s) and inlet temperature(s) to the catalyst control system demonstrated to result in compliance with the NO<sub>x</sub> emission limit(s) shall be maintained and made available for inspection upon request. [District Rule 4702]
- The SCR system reagent injection rate may be reestablished during a performance test by monitoring the SCR system reagent injection rate concurrently with each testing run to reestablish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limitations stated in this permit. Acceptable values and ranges may be reestablished for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable SCR system reagent injection rate(s) demonstrated during the performance test that result in compliance with the NO<sub>x</sub> emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
- If the SCR system reagent injection rate is outside of the established acceptable range, the permittee shall return the SCR system reagent injection rate to within the established acceptable range as soon as possible, but no longer than 8 hours after detection. If the SCR system reagent injection rate is not returned to within acceptable range within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of NO<sub>x</sub> and O<sub>2</sub> at least once every month. Monthly monitoring of the stack concentration of NO<sub>x</sub> and O<sub>2</sub> shall continue until the operator can show that the SCR system reagent injection rate is returned to operating within the acceptable range demonstrated to result in compliance with the NO<sub>x</sub> emission limits of this permit. [District Rule 4702]
- During initial performance testing, and during subsequent performance tests as needed, the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system shall be monitored concurrently with each testing run to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limits stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10%

increments (e.g. 70%, 80%, and 90%). The acceptable inlet temperature and back pressure demonstrated during the initial compliance test that result in compliance with the CO and VOC emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]

- The inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system may be reestablished during a performance test by monitoring concurrently with each testing run to reestablish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limitations stated in this permit. Acceptable values and ranges may be reestablished for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system demonstrated during the performance test that result in compliance with the CO and VOC emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
- If the inlet temperature to the catalyst control system and/or the back pressure of the exhaust upstream of the catalyst control system is outside of the established acceptable ranges established during the initial compliance test, the permittee shall return the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system back to the acceptable range as soon as possible, but no longer than 8 hours after detection. If the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system are not returned to within acceptable range within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of CO and O<sub>2</sub> at least once every month. Monthly monitoring of the stack concentration of CO and O<sub>2</sub> shall continue until the operator can show that the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system are returned to operating within the acceptable ranges specified within this permit. [District Rule 4702]
- The permittee shall monitor and record the engine operating load, the SCR system reagent injection rate, the inlet temperature to the catalyst control system, and the back pressure of the exhaust upstream of the catalyst control system at least once per month. [District Rules 2201 and 4702]
- The permittee shall monitor and record the stack concentration of NO<sub>x</sub>, CO, and O<sub>2</sub> at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if two consecutive deviations are observed during quarterly monitoring. 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 if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
- The permittee shall monitor and record the stack concentration of NH<sub>3</sub> at least once every calendar quarter in which a source test is not performed. NH<sub>3</sub> monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last quarter. Records must be

maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 2201]

- If the NO<sub>x</sub>, CO, or NH<sub>3</sub> concentrations corrected to 15% O<sub>2</sub>, as measured by the portable analyzer or the District approved ammonia monitoring equipment, exceed the allowable emission concentration(s), 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(s) 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. [District Rules 2201 and 4702]
- {modified 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 Rules 2201 and 4702]

Section 6.5.6 requires procedures and corrective maintenance performed for the purpose of maintaining an engine in proper operating condition. The applicant has proposed that each engine will be operated and maintained per the specifications of the manufacturer or emissions control system supplier. The following conditions will be included on each IC engine permit as a mechanism to enforce compliance:

- {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [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 requires procedures and a schedule for using a portable NO<sub>x</sub> analyzer to take NO<sub>x</sub> emission readings pursuant to Section 5.8.9. The applicant has proposed that the alternate monitoring program will ensure compliance with this section of the rule. The following condition will be placed on the permit to ensure continued compliance:

- All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5)

readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 2201 and 4702]

Section 6.5.8 requires procedures for collecting and recording required data and other information in a form approved by the APCO including, but not limited to, data collected through the I&M plan and the monitoring systems described in Sections 5.8.1 and 5.8.2. Data collected through the I&M plan shall have retrieval capabilities as approved by the APCO. The applicant has proposed that the alternate monitoring program will ensure compliance with this section of the rule. The following condition will be included on each IC engine permit as a mechanism to enforce compliance:

- The permittee shall maintain records of: (1) the date and time of NO<sub>x</sub>, CO, O<sub>2</sub>, and NH<sub>3</sub> measurements, (2) the O<sub>2</sub> concentration in percent and the measured NO<sub>x</sub>, CO, and NH<sub>3</sub> concentrations corrected to 15% O<sub>2</sub>, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH<sub>3</sub> emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]

Section 6.5.9 specifies procedures for revising the I&M plan. The I&M plan shall be updated to reflect any change in operation. The I&M plan shall be updated prior to any planned change in operation. An engine operator that changes significant I&M plan elements must notify the District no later than seven days after the change and must submit an updated I&M plan to the APCO no later than 14 days after the change for approval. The date and time of the change to the I&M plan shall be recorded in the engine operating log. For new engines and modifications to existing engines, the I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit-to-Operate. The operator of an engine may request a change to the I&M plan at any time.

The applicant has proposed to comply with the I&M plan modification requirements per this section of the rule. The following condition will be included on each IC engine permit as a mechanism to enforce compliance:

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

Section 7.0 specifies the schedules for compliance with the general requirements of Section 5.0 and the Alternative Emission Control Plan (AECPP) option of Section 8.0. The proposed engines will be required to comply with the applicable sections of District Rule 4702 upon initial startup and compliance with the requirements of this section is expected.

Section 8.0 specifies requirements for use of an Alternative Emission Control Plan (AECPP). An AECPP will not be used for the engines in this project; therefore, Section 8.0 is not applicable.

Section 9.0 specifies requirements for certification of exhaust control systems for compliance with District Rule 4702. No certification of an emissions control system is proposed with this project; therefore, Section 9.0 is not applicable.

As discussed above, the proposed engines are expected to comply with the applicable requirements of this rule upon initial startup and during subsequent continued operation.

### 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 SO<sub>2</sub>) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

$$\text{Volume of SO}_x \text{ as (SO}_2\text{)} = (n \times R \times T) \div P$$

Where:

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

T = standard temperature: 60 °F or 520 °R

R = universal gas constant:  $\frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot \text{°R}}$

#### N-9354-1-0:

#### Digester System and Backup/Emergency Flare

To demonstrate compliance with the sulfur compound emission limit of Rule 4801, the maximum sulfur compound emissions from the flare will be calculated using the maximum sulfur content allowed for the digester gas.

$$\frac{0.35 \text{ lb-SO}_x}{\text{MMBtu}} \times \frac{\text{MMBtu}}{9,100 \text{ scf-exhaust}} \times \frac{\text{lb-mol}}{64 \text{ lb-SO}_2} \times \frac{10.73 \text{ psi-ft}^3}{\text{lb-mol} \cdot \text{°R}} \times \frac{520 \text{ °R}}{14.7 \text{ psi}} \times 10^6 = 163 \text{ ppmv}$$

Since 163 ppmv is less than 2000 ppmv, the flare is expected to comply with Rule 4801.

#### Natural Gas-Fired RTO

To demonstrate compliance with the sulfur compound emission limit of Rule 4801, the maximum sulfur compound emissions from each engine will be calculated using the maximum sulfur content allowed for the natural gas, which is 0.00285 lb-SO<sub>x</sub>/MMBtu.

$$\frac{0.00285 \text{ lb}}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{8,578 \text{ scf}} \times \frac{1 \text{ lb-mol}}{64 \text{ lb-SO}_2} \times \frac{10.73 \text{ psi-ft}^3}{\text{lb-mol} \cdot \text{°R}} \times \frac{520 \text{ °R}}{14.7 \text{ psi}} \times 1,000,000 \text{ ppm} = 1.97 \text{ ppmv}$$

Since 1.97 ppmv is less than 2000 ppmv, the engines are expected to comply with Rule 4801.

#### N-9354-2-0, -3-0, -4-0 (Natural Gas-Fired IC Engines)

To demonstrate compliance with the sulfur compound emission limit of Rule 4801, the maximum sulfur compound emissions from each engine will be calculated using the maximum sulfur content allowed for the natural gas, which is 0.00285 lb-SO<sub>x</sub>/MMBtu.

$$\frac{0.00285 \text{ lb}}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{8,578 \text{ scf}} \times \frac{1 \text{ lb-mol}}{64 \text{ lb-}} \times \frac{10.73 \text{ psi-f}^3}{\text{lb-mol-}^\circ\text{R}} \times \frac{520^\circ\text{R}}{14.7 \text{ psi}} \times 1,000,000 \text{ ppm} = 1.97 \text{ ppmv}$$

Since 1.97 ppmv is less than 2000 ppmv, the engines are expected to comply with Rule 4801.

The following conditions will be included on each permit as shown as a mechanism to enforce compliance.

N-9354-1-0:

- The sulfur content of the digester gas combusted in the flare shall not exceed 1,200 ppmv as H<sub>2</sub>S. The applicant may utilize an averaging period of up to 24 hours in length for demonstration of compliance with the fuel sulfur content limit. [District Rules 2201 and 4801]
- Only PUC quality natural gas shall be used in the RTO as supplemental fuel. [District Rules 2201 and 4801]

N-9354-2-0, -3-0, & -4-0: Digester Gas-Fired IC Engines

- This engine shall be fired only on PUC quality natural gas fuel. [District Rules 2201, 4702, and 4801]

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

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

**California Environmental Quality Act (CEQA)**

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

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



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

It is determined that another agency has prepared an environmental review document for the project. The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381). As a Responsible Agency, the District is limited to mitigating or avoiding impacts for which it has statutory authority. The District does not have statutory authority for regulating greenhouse gas emissions. The District has determined that the applicant is responsible for implementing greenhouse gas mitigation measures, if any, imposed by the Lead Agency.

## **District CEQA Findings**

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

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

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

## **Indemnification Agreement/Letter of Credit Determination**

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit is based on a case-by-case analysis of a particular project's potential for litigation risk, which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

The criteria pollutant emissions and toxic air contaminant emissions associated with the proposed project are not significant, and there is minimal potential for public concern for this particular type of facility/operation. Therefore, an Indemnification Agreement and/or a Letter of Credit will not be required for this project in the absence of expressed public concern.

**IX. Recommendation**

Compliance with all applicable rules and regulations is expected. Pending a successful NSR Public Noticing period, issue ATCs N-9354-1-0, -2-0, -3-0, -4-0 subject to the permit conditions on the attached draft ATCs in Appendix A.

**X. Billing Information**

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
N-9354-1-0	3020-02-H	38.718 MMBtu/hr	\$1,238
N-9354-2-0	3020-10-E	770 bhp IC engine	\$723
N-9354-3-0	3020-10-E	770 bhp IC engine	\$723
N-9354-4-0	3020-10-E	770 bhp IC engine	\$723

**Appendices**

- A: Draft ATCs
- B: BACT Guideline
- C: BACT Analysis
- D: HRA and AAQA Summary
- E: Quarterly Net Emissions Change
- F: Engine Data Sheet

**APPENDIX A**  
**Draft ATCs**

San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

ISSUANCE DATE: DRAFT  
**DRAFT**

**PERMIT NO:** N-9354-1-0

**LEGAL OWNER OR OPERATOR:** VS DIGESTER  
**MAILING ADDRESS:** 13749 MURPH RD  
ESCALON, CA 95320

**LOCATION:** 13749 MURPH RD  
ESCALON, CA 95320

**EQUIPMENT DESCRIPTION:**

DIGESTER SYSTEM CONSISTING OF TWO COVERED DIGESTER LAGOONS, ONE LAGOON, ONE HYDROLYZER, ONE 37.468 MMBTU/HR DIGESTER GAS-FIRED BACKUP FLARE, PERMIT EXEMPT BOILERS (NATURAL GAS-FIRED, 5 MMBTU/HR OR LESS), AND A DIGESTER GAS UPGRADING OPERATION CONSISTING OF FEED GAS BLOWERS, COMPRESSORS, COOLERS, CHILLERS, IRON SPONGE H<sub>2</sub>S REMOVAL, A MEMBRANE CO<sub>2</sub> REMOVAL SYSTEM, PRODUCT GAS COMPRESSORS, AND A 1.25 MMBTU/HR TRITON 4.95 NATURAL GAS-FIRED REGENERATIVE THERMAL OXIDIZER (RTO)

**CONDITIONS**

1. {271} All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]
2. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
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. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. The exhaust stacks of the flare and RTO 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]
6. The VOC content of the digester gas produced by the digester system shall not exceed 10% by weight. [District Rule 2201]
7. The flare shall be operated only for testing and maintenance, backup, and emergency purposes. [District Rule 2201]
8. The flare shall not operate for more than 200 hours per year. [District Rules 2201, 4102, and 4311]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

**Brian Clements, Director of Permit Services**

N-9354-1-0 : Aug 26 2021 2:50PM -- GARCIAJ : Joint Inspection NOT Required

9. The flare shall be equipped with an operational non-resettable hour meter. [District Rules 2201 and 4311]
10. Emissions rates from the combustion of digester gas in the flare shall not exceed any of the following limits: 0.06 lb-NO<sub>x</sub>/MMBtu, 0.35 lb-SO<sub>x</sub>/MMBtu, 0.015 lb-PM<sub>10</sub>/MMBtu, 0.046 lb-CO/MMBtu, or 0.006 lb-VOC/MMBtu. [District Rule 2201]
11. The sulfur content of the digester gas combusted in the flare shall not exceed 1,200 ppmv as H<sub>2</sub>S. The applicant may utilize an averaging period of up to 24 hours in length for demonstration of compliance with the fuel sulfur content limit. [District Rules 2201 and 4801]
12. The sulfur content of the digester gas combusted in this flare shall be monitored and recorded at least once every calendar quarter in which a digester gas sulfur content analysis is not performed. If quarterly monitoring shows a violation of the sulfur content limit of this permit, monthly monitoring will be required until six consecutive months of monitoring show compliance with the sulfur content limit. Once compliance with the 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 flared shall not be required if the flare does not operate during that period. Records of the results of monitoring of the digester gas sulfur content shall be maintained. [District Rule 2201]
13. Monitoring of the digester gas sulfur content shall be performed using gas detection tubes calibrated for H<sub>2</sub>S; a Testo 350 XL portable emission monitor; a continuous fuel gas monitor that meets the requirements specified in SCAQMD Rule 431.1, Attachment A; District-approved source test methods, including EPA Method 15, ASTM Method D1072, D4084, and D5504; District-approved in-line H<sub>2</sub>S monitors; 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]
14. A flame shall be present at all times whenever combustible gases are vented through the flare. [District Rules 2201 and 4311]
15. The flare outlet shall be equipped with an automatic ignition system, or shall operate with a pilot flame present at all times when combustible gases are vented through the flare, except during purge periods for automatic-ignition equipped flares. [District Rules 2201 and 4311]
16. Unless the flare is equipped with a flow-sensing ignition system, the flare shall be equipped and operated with a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting at least one pilot flame. [District Rules 2201 and 4311]
17. Flares that use flow-sensing automatic ignition systems and which do not use a continuous flame pilot shall use purge gas for purging. [District Rules 2201 and 4311]
18. Open flares (air-assisted, steam-assisted, or non-assisted) in which the flare gas pressure is less than 5 psig shall be operated in such a manner that meets the provisions of 40 CFR 60.18. [District Rules 2201 and 4311]
19. Upon request, the operator of an open flare in which the flare gas pressure is less than 5 psig shall make available records that demonstrate compliance with the provisions of 40 CFR 60.18, (c)(3) through (c)(5). [District Rules 2201 and 4311]
20. Only PUC quality natural gas shall be used in the RTO as supplemental fuel. [District Rules 2201 and 4801]
21. The RTO shall be operated with a combustion chamber temperature of no less than 1600 degrees F and the retention time shall be no less than 0.5 seconds. [District Rule 2201]
22. The RTO shall be heated to the proper operating temperature prior to introducing the contaminated air stream. [District Rules 2201 and 4104]
23. Emissions from the RTO shall not exceed any of the following limits: 0.022 lb-NO<sub>x</sub>/MMBtu, 0.00285 lb-SO<sub>x</sub>/MMBtu, 0.0075 lb-PM<sub>10</sub>/MMBtu, 0.0824 lb-CO/MMBtu, or 0.0054 lb-VOC/MMBtu. [District Rule 2201]
24. The RTO temperature shall be monitored and recorded utilizing a continuous monitoring and recording device. The monitoring and recording device shall be maintained in proper operating condition at all times. [District Rule 2201]
25. Permittee shall maintain annual records of the operation of the flare, in hours. [District Rules 1070 and 2201]

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CONDITIONS CONTINUE ON NEXT PAGE

26. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. Records may be maintained and submitted in an electronic format approved by the District. [District Rules 1070, 2201, and 4311]
27. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

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San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

**ISSUANCE DATE: DRAFT**

**PERMIT NO:** N-9354-2-0

**LEGAL OWNER OR OPERATOR:** VS DIGESTER  
**MAILING ADDRESS:** 13749 MURPH RD  
ESCALON, CA 95320

**LOCATION:** 13749 MURPH RD  
ESCALON, CA 95320

**EQUIPMENT DESCRIPTION:**

770 BHP 2G ENERGY MODEL AVUS 500PLUS NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR AND PROVIDING HEAT FOR THE DIGESTER SYSTEM PERMITTED UNDER N-9354-1

**CONDITIONS**

1. All equipment shall be maintained in good operating condition and shall be operated in a manner consistent with good air pollution control practice to minimize emissions of air contaminants. [District Rule 2201]
2. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
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. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. {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]
6. This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702]
7. The SCR 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]
8. {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Brian Clements, Director of Permit Services

N-9354-2-0 : Aug 26 2021 2:51PM -- GARCIAJ : Joint Inspection NOT Required

9. {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]
10. This engine shall be fired only on PUC quality natural gas fuel. [District Rules 2201, 4702, and 4801]
11. The maximum fuel consumption of this engine shall not exceed 4.627 MMBtu/hr. [District Rule 2201]
12. Emissions from this IC engine shall not exceed any of the following limits: 0.018 lb-NO<sub>x</sub>/MMBtu (equivalent to 5 ppmvd NO<sub>x</sub> @ 15% O<sub>2</sub>), NO<sub>x</sub> referenced as NO<sub>2</sub>; 0.003 lb-PM<sub>10</sub>/MMBtu; 0.20 lb-CO/MMBtu (equivalent to 90 ppmvd CO @ 15% O<sub>2</sub>); or 0.025 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC @ 15% O<sub>2</sub>), VOC referenced as CH<sub>4</sub>. [District Rules 2201 and 4702]
13. Ammonia (NH<sub>3</sub>) emissions from this engine shall not exceed 10 ppmvd @ 15% O<sub>2</sub>. [District Rule 2201]
14. Source testing to measure NO<sub>x</sub>, CO, VOC, PM<sub>10</sub>, and ammonia (NH<sub>3</sub>) emissions from this unit shall be conducted within 60 days of initial startup operation. [District Rules 1081, 2201, and 4702]
15. Source testing to measure NO<sub>x</sub>, CO, VOC, and ammonia (NH<sub>3</sub>) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]
16. 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 Rules 2201 and 4702]
17. The results of each source test shall be submitted to the District within 60 days after completion of the source test. [District Rule 1081]
18. {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]
19. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as methane. NO<sub>x</sub>, CO, VOC, and NH<sub>3</sub> concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rules 2201 and 4702]
20. The following methods shall be used for source testing: NO<sub>x</sub> (ppmv) - EPA Method 7E or ARB Method 100; CO (ppmv) - EPA Method 10 or ARB Method 100; VOC (ppmv) - EPA Method 18, 25A or 25B, or ARB Method 100; stack gas oxygen - EPA Method 3 or 3A or ARB Method 100; stack gas velocity - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; NH<sub>3</sub> - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
21. 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 NO<sub>x</sub>, CO, and O<sub>2</sub> 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]
22. The permittee shall monitor and record the stack concentration of NO<sub>x</sub>, CO, and O<sub>2</sub> at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if two consecutive deviations are observed during quarterly monitoring. 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 if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

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CONDITIONS CONTINUE ON NEXT PAGE



23. The permittee shall monitor and record the stack concentration of NH<sub>3</sub> at least once every calendar quarter in which a source test is not performed. NH<sub>3</sub> monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last quarter. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 2201]
24. If the NO<sub>x</sub>, CO, or NH<sub>3</sub> concentrations corrected to 15% O<sub>2</sub>, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective permitted emissions concentration(s), the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the permitted emissions concentration(s) after 8 hours of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]
25. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 2201 and 4702]
26. The permittee shall maintain records of: (1) the date and time of NO<sub>x</sub>, CO, O<sub>2</sub>, and NH<sub>3</sub> measurements, (2) the O<sub>2</sub> concentration in percent and the measured NO<sub>x</sub>, CO, and NH<sub>3</sub> concentrations corrected to 15% O<sub>2</sub>, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH<sub>3</sub> emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
27. During initial performance testing, and during subsequent performance tests as needed, the SCR system reagent injection rate shall be monitored to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the NO<sub>x</sub> emissions limit(s) stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). Records of the acceptable SCR system reagent injection rate(s) and inlet temperature(s) to the catalyst control system demonstrated to result in compliance with the NO<sub>x</sub> emission limit(s) shall be maintained and made available for inspection upon request. [District Rule 4702]
28. The SCR system reagent injection rate may be reestablished during a performance test by monitoring the SCR system reagent injection rate concurrently with each testing run to reestablish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limitations stated in this permit. Acceptable values and ranges may be reestablished for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable SCR system reagent injection rate(s) demonstrated during the performance test that result in compliance with the NO<sub>x</sub> emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
29. If the SCR system reagent injection rate is outside of the established acceptable range, the permittee shall return the SCR system reagent injection rate to within the established acceptable range as soon as possible, but no longer than 8 hours after detection. If the SCR system reagent injection rate is not returned to within acceptable range within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of NO<sub>x</sub> and O<sub>2</sub> at least once every month. Monthly monitoring of the stack concentration of NO<sub>x</sub> and O<sub>2</sub> shall continue until the operator can show that the SCR system reagent injection rate is returned to operating within the acceptable range demonstrated to result in compliance with the NO<sub>x</sub> emission limits of this permit. [District Rule 4702]

30. During initial performance testing, and during subsequent performance tests as needed, the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system shall be monitored concurrently with each testing run to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limits stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable inlet temperature and back pressure demonstrated during the initial compliance test that result in compliance with the CO and VOC emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
31. The inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system may be reestablished during a performance test by monitoring concurrently with each testing run to reestablish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limitations stated in this permit. Acceptable values and ranges may be reestablished for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system demonstrated during the performance test that result in compliance with the CO and VOC emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
32. If the inlet temperature to the catalyst control system and/or the back pressure of the exhaust upstream of the catalyst control system is outside of the established acceptable ranges established during the initial compliance test, the permittee shall return the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system back to the acceptable range as soon as possible, but no longer than 8 hours after detection. If the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system are not returned to within acceptable range within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of CO and O<sub>2</sub> at least once every month. Monthly monitoring of the stack concentration of CO and O<sub>2</sub> shall continue until the operator can show that the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system are returned to operating within the acceptable ranges specified within this permit. [District Rule 4702]
33. The permittee shall monitor and record the engine operating load, the SCR system reagent injection rate, the inlet temperature to the catalyst control system, and the back pressure of the exhaust upstream of the catalyst control system at least once per month. [District Rule 4702]
34. {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]
35. 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, the type and quantity of fuel used during commissioning period(s), the type and quantity of fuel used 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]
36. 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]

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San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

**ISSUANCE DATE: DRAFT**

**PERMIT NO:** N-9354-3-0

**LEGAL OWNER OR OPERATOR:** VS DIGESTER  
**MAILING ADDRESS:** 13749 MURPH RD  
ESCALON, CA 95320

**LOCATION:** 13749 MURPH RD  
ESCALON, CA 95320

**EQUIPMENT DESCRIPTION:**

770 BHP 2G ENERGY MODEL AVUS 500PLUS NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR AND PROVIDING HEAT FOR THE DIGESTER SYSTEM PERMITTED UNDER N-9354-1

**CONDITIONS**

1. All equipment shall be maintained in good operating condition and shall be operated in a manner consistent with good air pollution control practice to minimize emissions of air contaminants. [District Rule 2201]
2. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
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. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. {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]
6. This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702]
7. The SCR 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]
8. {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]

CONDITIONS CONTINUE ON NEXT PAGE

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Samir Sheikh, Executive Director / APCO

Brian Clements, Director of Permit Services

N-9354-3-0 : Aug 26 2021 2:51PM - GARCIAJ : Joint Inspection NOT Required

9. {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]
10. This engine shall be fired only on PUC quality natural gas fuel. [District Rules 2201, 4702, and 4801]
11. The maximum fuel consumption of this engine shall not exceed 4.627 MMBtu/hr. [District Rule 2201]
12. Emissions from this IC engine shall not exceed any of the following limits: 0.018 lb-NO<sub>x</sub>/MMBtu (equivalent to 5 ppmvd NO<sub>x</sub> @ 15% O<sub>2</sub>), NO<sub>x</sub> referenced as NO<sub>2</sub>; 0.003 lb-PM<sub>10</sub>/MMBtu; 0.20 lb-CO/MMBtu (equivalent to 90 ppmvd CO @ 15% O<sub>2</sub>); or 0.025 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC @ 15% O<sub>2</sub>), VOC referenced as CH<sub>4</sub>. [District Rules 2201 and 4702]
13. Ammonia (NH<sub>3</sub>) emissions from this engine shall not exceed 10 ppmvd @ 15% O<sub>2</sub>. [District Rule 2201]
14. Source testing to measure NO<sub>x</sub>, CO, VOC, PM<sub>10</sub>, and ammonia (NH<sub>3</sub>) emissions from this unit shall be conducted within 60 days of initial startup operation. [District Rules 1081, 2201, and 4702]
15. Source testing to measure NO<sub>x</sub>, CO, VOC, and ammonia (NH<sub>3</sub>) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]
16. 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 Rules 2201 and 4702]
17. The results of each source test shall be submitted to the District within 60 days after completion of the source test. [District Rule 1081]
18. {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]
19. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as methane. NO<sub>x</sub>, CO, VOC, and NH<sub>3</sub> concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rules 2201 and 4702]
20. The following methods shall be used for source testing: NO<sub>x</sub> (ppmv) - EPA Method 7E or ARB Method 100; CO (ppmv) - EPA Method 10 or ARB Method 100; VOC (ppmv) - EPA Method 18, 25A or 25B, or ARB Method 100; stack gas oxygen - EPA Method 3 or 3A or ARB Method 100; stack gas velocity - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; NH<sub>3</sub> - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
21. 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 NO<sub>x</sub>, CO, and O<sub>2</sub> 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]
22. The permittee shall monitor and record the stack concentration of NO<sub>x</sub>, CO, and O<sub>2</sub> at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if two consecutive deviations are observed during quarterly monitoring. 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 if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

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CONDITIONS CONTINUE ON NEXT PAGE

23. The permittee shall monitor and record the stack concentration of NH<sub>3</sub> at least once every calendar quarter in which a source test is not performed. NH<sub>3</sub> monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last quarter. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 2201]
24. If the NO<sub>x</sub>, CO, or NH<sub>3</sub> concentrations corrected to 15% O<sub>2</sub>, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective permitted emissions concentration(s), the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the permitted emissions concentration(s) after 8 hours of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]
25. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 2201 and 4702]
26. The permittee shall maintain records of: (1) the date and time of NO<sub>x</sub>, CO, O<sub>2</sub>, and NH<sub>3</sub> measurements, (2) the O<sub>2</sub> concentration in percent and the measured NO<sub>x</sub>, CO, and NH<sub>3</sub> concentrations corrected to 15% O<sub>2</sub>, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH<sub>3</sub> emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
27. During initial performance testing, and during subsequent performance tests as needed, the SCR system reagent injection rate shall be monitored to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the NO<sub>x</sub> emissions limit(s) stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). Records of the acceptable SCR system reagent injection rate(s) and inlet temperature(s) to the catalyst control system demonstrated to result in compliance with the NO<sub>x</sub> emission limit(s) shall be maintained and made available for inspection upon request. [District Rule 4702]
28. The SCR system reagent injection rate may be reestablished during a performance test by monitoring the SCR system reagent injection rate concurrently with each testing run to reestablish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limitations stated in this permit. Acceptable values and ranges may be reestablished for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable SCR system reagent injection rate(s) demonstrated during the performance test that result in compliance with the NO<sub>x</sub> emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
29. If the SCR system reagent injection rate is outside of the established acceptable range, the permittee shall return the SCR system reagent injection rate to within the established acceptable range as soon as possible, but no longer than 8 hours after detection. If the SCR system reagent injection rate is not returned to within acceptable range within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of NO<sub>x</sub> and O<sub>2</sub> at least once every month. Monthly monitoring of the stack concentration of NO<sub>x</sub> and O<sub>2</sub> shall continue until the operator can show that the SCR system reagent injection rate is returned to operating within the acceptable range demonstrated to result in compliance with the NO<sub>x</sub> emission limits of this permit. [District Rule 4702]

30. During initial performance testing, and during subsequent performance tests as needed, the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system shall be monitored concurrently with each testing run to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limits stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable inlet temperature and back pressure demonstrated during the initial compliance test that result in compliance with the CO and VOC emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
31. The inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system may be reestablished during a performance test by monitoring concurrently with each testing run to reestablish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limitations stated in this permit. Acceptable values and ranges may be reestablished for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system demonstrated during the performance test that result in compliance with the CO and VOC emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
32. If the inlet temperature to the catalyst control system and/or the back pressure of the exhaust upstream of the catalyst control system is outside of the established acceptable ranges established during the initial compliance test, the permittee shall return the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system back to the acceptable range as soon as possible, but no longer than 8 hours after detection. If the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system are not returned to within acceptable range within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of CO and O<sub>2</sub> at least once every month. Monthly monitoring of the stack concentration of CO and O<sub>2</sub> shall continue until the operator can show that the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system are returned to operating within the acceptable ranges specified within this permit. [District Rule 4702]
33. The permittee shall monitor and record the engine operating load, the SCR system reagent injection rate, the inlet temperature to the catalyst control system, and the back pressure of the exhaust upstream of the catalyst control system at least once per month. [District Rule 4702]
34. {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]
35. 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, the type and quantity of fuel used during commissioning period(s), the type and quantity of fuel used 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]
36. 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]

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San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

ISSUANCE DATE: DRAFT  
**DRAFT**

**PERMIT NO:** N-9354-4-0

**LEGAL OWNER OR OPERATOR:** VS DIGESTER  
**MAILING ADDRESS:** 13749 MURPH RD  
ESCALON, CA 95320

**LOCATION:** 13749 MURPH RD  
ESCALON, CA 95320

**EQUIPMENT DESCRIPTION:**

770 BHP 2G ENERGY MODEL AVUS 500PLUS NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR AND PROVIDING HEAT FOR THE DIGESTER SYSTEM PERMITTED UNDER N-9354-1

**CONDITIONS**

1. All equipment shall be maintained in good operating condition and shall be operated in a manner consistent with good air pollution control practice to minimize emissions of air contaminants. [District Rule 2201]
2. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
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. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. {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]
6. This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702]
7. The SCR 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]
8. {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

**Brian Clements, Director of Permit Services**

N-9354-4-0 : Aug 26 2021 2:51PM - GARCIAJ : Joint Inspection NOT Required

9. {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]
10. This engine shall be fired only on PUC quality natural gas fuel. [District Rules 2201, 4702, and 4801]
11. The maximum fuel consumption of this engine shall not exceed 4.627 MMBtu/hr. [District Rule 2201]
12. Emissions from this IC engine shall not exceed any of the following limits: 0.018 lb-NO<sub>x</sub>/MMBtu (equivalent to 5 ppmvd NO<sub>x</sub> @ 15% O<sub>2</sub>), NO<sub>x</sub> referenced as NO<sub>2</sub>; 0.003 lb-PM<sub>10</sub>/MMBtu; 0.20 lb-CO/MMBtu (equivalent to 90 ppmvd CO @ 15% O<sub>2</sub>); or 0.025 lb-VOC/MMBtu (equivalent to 20 ppmvd VOC @ 15% O<sub>2</sub>), VOC referenced as CH<sub>4</sub>. [District Rules 2201 and 4702]
13. Ammonia (NH<sub>3</sub>) emissions from this engine shall not exceed 10 ppmvd @ 15% O<sub>2</sub>. [District Rule 2201]
14. Source testing to measure NO<sub>x</sub>, CO, VOC, PM<sub>10</sub>, and ammonia (NH<sub>3</sub>) emissions from this unit shall be conducted within 60 days of initial startup operation. [District Rules 1081, 2201, and 4702]
15. Source testing to measure NO<sub>x</sub>, CO, VOC, and ammonia (NH<sub>3</sub>) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]
16. 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 Rules 2201 and 4702]
17. The results of each source test shall be submitted to the District within 60 days after completion of the source test. [District Rule 1081]
18. {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]
19. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as methane. NO<sub>x</sub>, CO, VOC, and NH<sub>3</sub> concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rules 2201 and 4702]
20. The following methods shall be used for source testing: NO<sub>x</sub> (ppmv) - EPA Method 7E or ARB Method 100; CO (ppmv) - EPA Method 10 or ARB Method 100; VOC (ppmv) - EPA Method 18, 25A or 25B, or ARB Method 100; stack gas oxygen - EPA Method 3 or 3A or ARB Method 100; stack gas velocity - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; NH<sub>3</sub> - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]
21. 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 NO<sub>x</sub>, CO, and O<sub>2</sub> 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]
22. The permittee shall monitor and record the stack concentration of NO<sub>x</sub>, CO, and O<sub>2</sub> at least once every calendar quarter (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall be performed not less than once every month for 12 months if two consecutive deviations are observed during quarterly monitoring. 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 if on a monthly monitoring schedule, or within the last quarter if on a quarterly monitoring schedule. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

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CONDITIONS CONTINUE ON NEXT PAGE



23. The permittee shall monitor and record the stack concentration of NH<sub>3</sub> at least once every calendar quarter in which a source test is not performed. NH<sub>3</sub> monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last quarter. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 2201]
24. If the NO<sub>x</sub>, CO, or NH<sub>3</sub> concentrations corrected to 15% O<sub>2</sub>, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective permitted emissions concentration(s), the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the permitted emissions concentration(s) after 8 hours of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]
25. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 2201 and 4702]
26. The permittee shall maintain records of: (1) the date and time of NO<sub>x</sub>, CO, O<sub>2</sub>, and NH<sub>3</sub> measurements, (2) the O<sub>2</sub> concentration in percent and the measured NO<sub>x</sub>, CO, and NH<sub>3</sub> concentrations corrected to 15% O<sub>2</sub>, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH<sub>3</sub> emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
27. During initial performance testing, and during subsequent performance tests as needed, the SCR system reagent injection rate shall be monitored to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the NO<sub>x</sub> emissions limit(s) stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). Records of the acceptable SCR system reagent injection rate(s) and inlet temperature(s) to the catalyst control system demonstrated to result in compliance with the NO<sub>x</sub> emission limit(s) shall be maintained and made available for inspection upon request. [District Rule 4702]
28. The SCR system reagent injection rate may be reestablished during a performance test by monitoring the SCR system reagent injection rate concurrently with each testing run to reestablish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limitations stated in this permit. Acceptable values and ranges may be reestablished for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable SCR system reagent injection rate(s) demonstrated during the performance test that result in compliance with the NO<sub>x</sub> emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
29. If the SCR system reagent injection rate is outside of the established acceptable range, the permittee shall return the SCR system reagent injection rate to within the established acceptable range as soon as possible, but no longer than 8 hours after detection. If the SCR system reagent injection rate is not returned to within acceptable range within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of NO<sub>x</sub> and O<sub>2</sub> at least once every month. Monthly monitoring of the stack concentration of NO<sub>x</sub> and O<sub>2</sub> shall continue until the operator can show that the SCR system reagent injection rate is returned to operating within the acceptable range demonstrated to result in compliance with the NO<sub>x</sub> emission limits of this permit. [District Rule 4702]

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CONDITIONS CONTINUE ON NEXT PAGE

30. During initial performance testing, and during subsequent performance tests as needed, the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system shall be monitored concurrently with each testing run to establish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limits stated in this permit. Acceptable values and ranges shall be established for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable inlet temperature and back pressure demonstrated during the initial compliance test that result in compliance with the CO and VOC emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
31. The inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system may be reestablished during a performance test by monitoring concurrently with each testing run to reestablish acceptable values and ranges that provide a reasonable assurance of ongoing compliance with the emissions limitations stated in this permit. Acceptable values and ranges may be reestablished for each load that the engine is expected to operate at, in a minimum of 10% increments (e.g. 70%, 80%, and 90%). The acceptable inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system demonstrated during the performance test that result in compliance with the CO and VOC emission limits shall be imposed as a condition in the Permit to Operate. [District Rule 4702]
32. If the inlet temperature to the catalyst control system and/or the back pressure of the exhaust upstream of the catalyst control system is outside of the established acceptable ranges established during the initial compliance test, the permittee shall return the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system back to the acceptable range as soon as possible, but no longer than 8 hours after detection. If the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system are not returned to within acceptable range within 8 hours, the permittee shall notify the District within the following 1 hour and begin monitoring and recording the stack concentration of CO and O<sub>2</sub> at least once every month. Monthly monitoring of the stack concentration of CO and O<sub>2</sub> shall continue until the operator can show that the inlet temperature to the catalyst control system and the back pressure of the exhaust upstream of the catalyst control system are returned to operating within the acceptable ranges specified within this permit. [District Rule 4702]
33. The permittee shall monitor and record the engine operating load, the SCR system reagent injection rate, the inlet temperature to the catalyst control system, and the back pressure of the exhaust upstream of the catalyst control system at least once per month. [District Rule 4702]
34. {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]
35. 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, the type and quantity of fuel used during commissioning period(s), the type and quantity of fuel used 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]
36. 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]

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**APPENDIX B**  
**BACT Guideline**

San Joaquin Valley  
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 5.8.12\*

Last Update: 8/2/2018

Dairy Manure Digester with Backup/Emergency Flare

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Open flare (98% control efficiency)	Ultra-low emissions (ULE) enclosed flare (99% control efficiency)	

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

\*This is a Summary Page for this Class of Source

**APPENDIX C**  
**BACT Analysis**

## BACT Analysis for Dairy Manure Digester with Backup/Emergency Flare

### Top-Down BACT Analysis for VOC Emissions

#### **Step 1 - Identify all control technologies**

The following options were identified to reduce VOC emissions:

- 1) Open flare (Achieved in Practice)
- 2) Ultra-low emissions (ULE) enclosed flare (Technologically Feasible)

#### **Step 2 - Eliminate technologically infeasible options**

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

#### **Step 3 - Rank remaining options by control effectiveness**

- 1) Ultra-low emissions (ULE) enclosed flare (99% control efficiency) (Technologically Feasible)
- 2) Open flare (98% control efficiency) (Achieved in Practice)

#### **Step 4 - Cost Effectiveness Analysis**

Option 1: Ultra-low emissions (ULE) enclosed flare (99% control efficiency) (Technologically Feasible)

Because the ULE enclosed flare results in reduced NO<sub>x</sub> and VOC emissions in comparison to an open flare, a Multi-Pollutant Cost Effectiveness Threshold (MCET) will be used to determine if this option is cost-effective.

NO<sub>x</sub> emission rate from an open flare = 0.06 lb/MMBtu

Uncontrolled VOC emission rate = (0.006 lb/MMBtu)/(1 – 0.98) = 0.3 lb/MMBtu

ULE enclosed flare NO<sub>x</sub> emission rate = 0.025 lb/MMBtu per District Rule 4311<sup>5</sup>

ULE enclosed flare VOC emission rate = (0.3 lb/MMBtu) x (1 – 0.99) = 0.003 lb/MMBtu

NO<sub>x</sub> reduction = [(0.06 – 0.025) lb/MMBtu] x 37.468 MMBtu/hr x 438 hrs/yr x (1 ton/2,000 lb) = 0.287 tons- NO<sub>x</sub>/year

VOC reduction = [(0.006 – 0.003) lb/MMBtu] x 37.468 MMBtu/hr x 438 hrs/yr x (1 ton/2,000 lb) = 0.025 tons-VOC/year

#### **Cost**

Several flare manufacturers were contacted for cost estimates in Project C-1162454, which was finalized in November 2018, which was for a similar operation, but with a smaller flare (12.25 MMBtu/hr vs 37.468 MMBtu/hr). Cost information was also obtained for the development of Rule 4311 for a 16.5 MMBtu/hr flare. A summary of the cost

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<sup>5</sup> This NO<sub>x</sub> limit was established based on the currently available control technologies that have been proven to be technologically feasible for the specific type of flaring operation, taking into consideration the gas composition and flow.

estimates received are summarized below:

<b>Emission Factors for Natural Gas-Fired RTO</b>		
<b>Flare Size</b>	<b>Installed Cost</b>	<b>Source</b>
12 MMBtu/hr	\$240,000	Project C-11692454: Aereon Representative
13 MMBtu/hr	\$355,000	Project C-11692454: John Zink Representative
16.5 MMBtu/hr	\$361,858	District Rule 4311 Staff Report

Since these costs are for flares less than half the size of the proposed flare, these cost estimates are conservative estimates for this project. Therefore, the lowest cost listed above, \$240,000 will be used for this analysis, excluding any adjustment for inflation.

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

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

Where: A = Annual Cost  
P = Present Value  
I = Interest Rate (10%)  
N = Equipment Life (10 years)  
A =  $[\$240,000 \times 0.1(1.1)^{10}] / [(1.1)^{10} - 1]$   
= \$39,059/year

No operation costs are included at this time. If the technology is determined to not be cost effective based on the capital costs alone, then consideration of the operation costs will not be necessary, since such additional costs would only remove the technology even further from the cost effectiveness threshold.

Multi-Pollutant Cost Effectiveness Thresholds (MCET) for NO<sub>x</sub> and VOC Reductions based on District Standard Emission Reductions

$$(0.287 \text{ ton-NO}_x/\text{year} \times \$24,500/\text{ton-NO}_x) + (0.025 \text{ ton-VOC}/\text{year} \times \$17,500/\text{ton-VOC}) = \$7,469/\text{year}$$

As shown above, the annualized capital cost of this alternate option (\$39,059) exceeds the Multi-Pollutant Cost Effectiveness Threshold calculated for NO<sub>x</sub> and VOC emission reductions of \$7,469/ton. Therefore, this option is not cost effective and is being removed from consideration.

Option 2: VOC emissions  $\leq$  0.10 g/bhp-hr (Achieved in Practice)

This has been identified as achieved in practice and has been proposed by the applicant. Therefore, the option required and is not subject to a cost analysis.

**Step 5 - Select BACT**

Pursuant to the above BACT Analysis, BACT for VOC emissions from the proposed flare is an open flare with a 98% control efficiency. The applicant has proposed an open flare with a 98% control efficiency. Therefore, the BACT requirements for VOC are satisfied.



## BACT Analysis for Natural Gas-Fired IC Engines

### Top Down BACT Analysis for VOC Emissions

#### Step 1 - Identify All Possible Control Technologies

The District's rescinded BACT guideline 3.3.12 listed the existing BACT requirements for VOC from full-time fossil-fuel fired IC engines.

Previous SJVAPCD BACT Guideline 3.3.12 for Fossil Fuel-Fired IC Engines VOC Requirements		
Achieved in Practice	Technologically Feasible	Alternate Basic Equipment
<p>1. For all Compression Ignited engines: Use of an engine meeting the latest Tier standard</p> <p>2. For all Spark Ignited engines: 25 ppmvd @ 15% O<sub>2</sub> or 0.15 g/bhp-hr</p>	<p>1. For all Compression Ignited Engines: 50 percent reduction of latest Tier standard for VOC emissions using a catalytic oxidation system.</p> <p>2. For Rich Burn Spark Ignited engines: 12 ppmvd @ 15% O<sub>2</sub> or 0.069 g/bhp-hr</p>	<p>1. Electric Engine (When Feasible)</p>

However, since this guideline has been rescinded, the District will perform a project-specific BACT to determine the BACT requirements for the specific proposal.

The USA Environmental Protection Agency (USEPA) RACT/BACT/LAER, California Air Pollution Control Officers Association (CAPCOA) BACT Clearinghouse, the California Air Resources Board (CARB) BACT Clearinghouse, the South Coast Air Quality Management District (SCAQMD), the Ventura County Air Pollution Control District (VCAPCD), the Bay Area Air Quality Management District (BAAQMD) BACT Guidelines were reviewed to determine potential control technologies for this class and category of operation. Additionally, the District reviewed the applicable IC engine Rules from BAAQMD and SCAQMD, and Sacramento Metropolitan AQMD. The following table summarizes the results of the review of these BACT Clearinghouses and District Rules:

BACT Guideline Source	Equipment Rating	VOC Control Technology/Requirement
South Coast BACT Guidelines Part D IC Engine, Stationary, Non-Emergency, Electrical Generators (2-2-2018)	> 50 HP	Compliance with SCAQMD Rule 1110.2 (2-2-2018)
South Coast Rule 1110.2	New non-emergency Electrical Generators > 2/1/2008	VOC Emission Standard: 0.10 lbs/MW-hr  *When determining compliance with the lb/MW-hr VOC requirement, engines with heat recovery may include one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered (MW <sub>th</sub> -hr) in addition to each MW-hr of net electricity produced (MW <sub>e</sub> -hr)
Sacramento Metropolitan AQMD BACT Guidelines	N/A	Clearinghouse does not include Guideline applicable to this source category.

Sacramento Metropolitan AQMD Rule 412	> 50 BHP	750 ppmv @ 15% O <sub>2</sub>
<b>BACT Guideline Source</b>	<b>Equipment Rating</b>	<b>VOC Control Technology/Requirement</b>
Bay Area AQMD BACT Workbook Spark Ignition – Natural Gas Fired (Lean Burn)	≥ 50 BHP	<u>Achieved in Practice</u> 0.15 g/bhp-hr (32 ppmv @ 15% O <sub>2</sub> )
Bay Area AQMD BACT Workbook Spark Ignition, Natural Gas-Fired (Rich Burn)	≥ 50 BHP	<u>Achieved in Practice</u> 0.15 g/bhp-hr (25 ppmv @ 15% O <sub>2</sub> ) <u>Technologically Feasible</u> 0.069 g/bhp-hr (12 ppmv @ 15% O <sub>2</sub> )
Bay Area AQMD BACT Workbook Internal Combustion Engine Stationary prime, Non-Agricultural (Compression Ignited)	> 50 BHP	Latest Tier Standard (Achieved in Practice) 50% reduction of current Tier Standard (Technologically Feasible)
Bay Area AQMD Reg 9 Rule 8	> 50 BHP	None
Santa Barbara APCD (From CARB BACT Clearinghouse) ICE: 881 BHP Lean Burn IC Engine used for Cogeneration (2015)	N/A	0.115 g/bhp-hr
EPA New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart IIII	N/A	Compliance with Latest Tier Emission limits (Tier 4) 3.5 g/bhp-hr (NO <sub>x</sub> + VOC) for Compression Ignited Engines rated between 50 BHP and 75 BHP 0.14 g-VOC/bhp-hr for Compression Ignited Engines rated at 75 BHP and greater
EPA New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart JJJJ	N/A	0.7 g/bhp-hr or 60 ppmvd @ 15% O <sub>2</sub>
EPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) 40 CFR Part 63 Subpart ZZZZ	N/A	None
California Distributed Generation Certification Program	All Distributed Generation Units that Don't Require Air Permit from Districts	0.02 lb-VOC/MW-hr* *When determining compliance with the lb/MW-hr VOC requirement, engines with heat recovery may include one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered (MW <sub>th</sub> -hr) in addition to each MW-hr of net electricity produced (MW <sub>e</sub> -hr)

Additionally, the District performed a detailed industry survey and review of IC engines permitted within the District that are used for electric power generation. The following survey is divided into two subcategories:

- **Table 5:** IC engines with heat recovery
- **Table 6:** IC engines without heat recovery

For cogeneration units with a heat recovery system, the quantity of heat recovered was determined either from manufacturers data provided in the original permitting action, or from information that was provided by the facility for previous analyses.

As part of the industry survey, the District reviewed up to three of the most recent emissions source tests to gather the VOC emissions data for each engine. The following tables summarize the Districts review of VOC emissions from permitted engines used for power generation.

**NOTE:**

For each table below:

Green Highlight	IC Engine Achieves 0.02 lb-VOC/MW-hr or less
Red Highlight	IC Engine Does not Achieve 0.02 lb-VOC/MW-hr

**Table 5: VOC data for Engines Used for Power Generation With a Heat Recovery System**

Facility and Permit Unit	HP Rating	Generator Rating (kW)	Permitted VOC Limit (ppmv at 15% O <sub>2</sub> )	Heat Recovered -Design Value (MMBtu/hr)	Lb-VOC/MW-hr (based on permitted VOC limit, with heat recovery)	VOC Source Test data (ppmv at 15% O <sub>2</sub> )		Lb-VOC/MW-hr (based on highest VOC source test result, with heat recovery)
						Year	Result	
Atwater High N-1306-2-2	86	60	30	0.44	0.153	2013	<b>0.05</b>	0.0003
Ripon Unified N-686-3-0	122	60	30	0.366	0.179	2014	<b>1.73</b>	0.0104
						2016	0.61	
Dynatect Ro-Lab Inc. N-704-10-0	108	75	30	0.49	0.16	2014	0.4	0.0389
						2016	0.504	
						2018	<b>7.4</b>	
Dynatect Ro-Lab Inc N-704-11-0	108	75	30	0.49	0.16	2014	0.66	0.0440
						2016	1.07	
						2018	<b>8.36</b>	
Valley Chrome Plating C-1318-7-1	108	75	25	0.49	0.132	2013	<b>0.99</b>	0.0052
						2015	0.9	
						2017	0.9	
Yosemite Union High School C-1801-4-2	122	90	34	0.499	0.186	2012	<b>3.4</b>	0.0187
						2014	0.2	
						2016	0.5	
Yosemite Union High School C-1801-5-1	122	90	34	0.499	0.186	2013	<b>2.2</b>	0.0121
						2015	0.5	
						2017	0.5	
Pacific Choice Brands C-906-9-1	197	140	30	0.67	0.169	2011	<b>0.3</b>	0.0017
						2013	0.3	
						2016	0.03	

**Table 5: VOC data for Engines Used for Power Generation With a Heat Recovery System (Continued)**

Facility and Permit Unit	HP Rating	Generator Rating (kW)	Permitted VOC Limit (ppmv at 15% O <sub>2</sub> )	Heat Recovered -Design Value (MMBtu/hr)	Lb-VOC/MW-hr (based on permitted VOC limit, with heat recovery)	VOC Source Test data (ppmv at 15% O <sub>2</sub> )		Lb-VOC/MW-hr (based on highest VOC source test result, with heat recovery)
						Year	Result	
Super Store Industries N-3232-5-1	379	280	25	0.31824	0.23	2014	0.88	0.0437
						2016	1.01	
						2018	<b>4.72</b>	
Super Store Industries N-3232-6-1	379	280	25	0.31824	0.23	2014	3.01	0.0374
						2016	<b>4.04</b>	
						2018	2.88	
Super Store Industries N-3232-7-1	379	280	25	0.31824	0.23	2014	0.31	0.0496
						2016	4.03	
						2018	<b>5.36</b>	
Super Store Industries N-3232-8-1	379	280	25	0.31824	0.23	2014	1.41	0.0182
						2016	<b>1.97</b>	
						2018	1.49	
County of Tulare S-1609-4-1	1049	759	30	2	0.117	2011	<b>5.13</b>	0.0200
						2012	0.21	
						2013	2.42	
Western Co-Gen C-4161-1-3	1529	1140	25	2.41	0.117	2010	<b>15.1</b>	0.0709
						2011	10.8	
						2012	6.1	
Western Co-Gen C-4161-2-3	1529	1140	25	2.41	0.117	2013	4.4	0.0254
						2014	<b>5.4</b>	
						2015	1.02	
Fresno County Maintenance C-1629-6-1	1737	1250	25	2.57	0.178	2013	<b>45*</b>	0.3216*
						2014	2.7	
						2015	3.2	
Hilmar Cheese Turlock N-9141-3-1	3681	2652	25	8.542	0.142	2016	<b>2.8</b>	0.0159
						2018	1.9	
Hilmar Cheese Turlock N-9141-4-1	3681	2652	25	8.542	0.142	2016	2	0.0142
						2018	<b>2.5</b>	

\*Unit C-1629-6-1 failed their 2013 source test.

**Table 6: VOC data for Engines Used for Power Generation Without a Heat Recovery System**

Facility and Permit Unit	HP Rating	Generator Rating (kW)	Permitted VOC Limit (ppmv at 15% O <sub>2</sub> )	Lb-VOC/MW-hr (based on permitted limit)	VOC Source Test data (ppmv at 15% O <sub>2</sub> )		Lb-VOC/MW-hr (based on highest source test result)
					Year	Result	
California Power Holdings C-3775-1-9	4157	3100	30	0.355	2013	0.5	0.0106
					2015	<b>0.9</b>	
					2017	0.5	
California Power Holdings C-3775-2-9	4157	3100	30	0.355	2013	0.5	0.0237
					2015	<b>2</b>	
					2017	0.5	
California Power Holdings C-3775-3-9	4157	3100	30	0.355	2013	<b>0.7</b>	0.0083
					2015	0.7	
					2017	0.5	
California Power Holdings C-3775-4-9	4157	3100	30	0.355	2013	0.49	0.0059
					2015	0.3	
					2017	<b>0.5</b>	
California Power Holdings C-3775-5-9	4157	3100	30	0.355	2013	<b>0.5</b>	0.0059
					2015	0.4	
					2017	0.5	
California Power Holdings C-3775-6-9	4157	3100	30	0.355	2013	0.5	0.0106
					2015	<b>0.9</b>	
					2017	0.5	
California Power Holdings C-3775-7-9	4157	3100	30	0.355	2013	0.91	0.0414
					2015	<b>3.5</b>	
					2017	0.5	
California Power Holdings C-3775-8-9	4157	3100	30	0.355	2013	0.51	0.2377
					2015	<b>20.1</b>	
					2017	0.5	
California Power Holdings C-3775-9-9	4157	3100	30	0.355	2013	0.97	0.0438
					2015	<b>3.7</b>	
					2017	0.5	
California Power Holdings C-3775-10-9	4157	3100	30	0.355	2013	0.81	0.1963
					2015	<b>16.6</b>	
					2017	0.5	
California Power Holdings C-3775-11-9	4157	3100	30	0.355	2013	0.5	0.0449
					2015	<b>3.8</b>	
					2017	0.5	
California Power Holdings C-3775-12-9	4157	3100	30	0.355	2013	0.51	0.0154
					2015	<b>1.3</b>	
					2017	0.5	
California Power Holdings C-3775-13-9	4157	3100	30	0.355	2013	0.5	0.0083
					2015	<b>0.7</b>	
					2017	0.5	
California Power Holdings C-3775-14-9	4157	3100	30	0.355	2013	<b>0.81</b>	0.0096
					2015	0.3	
					2017	0.5	
California Power Holdings C-3775-15-9	4157	3100	30	0.355	2013	<b>0.59</b>	0.0070
					2015	0.3	
					2017	0.5	

**Table 6: VOC data for Engines Used for Power Generation Without a Heat Recovery System (Continued)**

Facility and Permit Unit	HP Rating	Generator Rating (kW)	Permitted VOC Limit (ppmv at 15% O <sub>2</sub> )	Lb-VOC/MW-hr (based on permitted limit)	VOC Source Test data (ppmv at 15% O <sub>2</sub> )		Lb-VOC/MW-hr (based on highest source test result)
					Year	Result	
California Power Holdings C-3775-16-9	4157	3,100	30	0.355	2013	0.82	0.0106
					2015	<b>0.9</b>	
					2017	0.5	
Modesto Irrigation District N-3233-6-3	11667	8,440	20	0.219	2016	<b>2.1</b>	0.0230
					2017	1.8	
					2018	1.3	
Modesto Irrigation District N-3233-7-3	11667	8,440	20	0.219	2016	<b>2.4</b>	0.0263
					2017	2	
					2018	1.3	
Modesto Irrigation District N-3233-8-3	11667	8,440	20	0.219	2016	<b>2.1</b>	0.0230
					2017	1.9	
					2018	1.2	
Modesto Irrigation District N-3233-9-3	11667	8,440	20	0.219	2016	1	0.0306
					2017	<b>2.8</b>	
					2018	1.3	
Modesto Irrigation District N-3233-10-3	11667	8,440	20	0.219	2016	0.011	0.0646
					2017	2.4	
					2018	<b>5.9</b>	
Modesto Irrigation District N-3233-11-3	11667	8,440	20	0.219	2016	3	0.0339
					2017	<b>3.1</b>	
					2018	2.8	

Based on an extensive review of California Air District rules, BACT guidelines, and an industry survey of IC engines permitted in the District, the following CO control options were identified:

VOC Control Option #1:

- For all Compression Ignited Engines: Use of an engine meeting the latest Tier standard;
- For all spark ignited engines: 25 ppmvd VOC @ 15% O<sub>2</sub> or 0.15 g/bhp-hr

This option is based upon the District's existing BACT Guideline requirements and has been achieved by multiple units within the District.

VOC Control Option #2:

- For Compression Ignited Engines: 50 percent reduction of latest Tier standard for VOC emissions using a catalytic oxidation system;
- For rich burn spark ignited engines: 12 ppmvd @ 15% O<sub>2</sub> or 0.069 g/bhp-hr

This option is based on the District's existing technologically feasible BACT Guideline requirements. No full-time compression ignited engines were identified in the District's survey of permitted units. The rich-burn engines within the District are meeting this level of VOC control.

VOC Control Option #3:

- 0.10 lbs-VOC/MW-hr

This option is based upon South Coast AQMD Rule 1110.2 and South Coast AQMD BACT requirements for non-emergency electrical generators installed after 2/1/2008. Nearly all of the units operating within the District have source tested at levels that achieve the 0.10 lbs-VOC/MW-hr limit.

South Coast AQMD Rule 1110.2 allows operators of IC engines used to generate both heat and electric power to demonstrate compliance with the VOC emissions standard of 0.10 lb/MW-hr by taking credit for the recovered thermal energy at the of one MW-hr for each 3.4 million Btus of heat recovered.

Based on data from permitted engines operating within SJVAPCD, the 0.10 lb-VOC/MW-hr limit is equivalent to 10 ppm, which is consistent with the SCAQMD Rule 1110.2 requirements:

- 17 ppmvd @ 15% O<sub>2</sub> for units with heat recovery;
- 0.10 lb-VOC/MW-hr

VOC Control Option #4:

- 0.02 lb-VOC/MW-hr

This option is based upon the VOC emission level listed in CARB's Distributed Generation (DG) Certification Regulation. The requirements of CARB's DG Certification Regulation only apply to units that do not require permits from Air Districts. Several of the units within the District are operating at levels equal to or lower than 0.02 lb-VOC/MW-hr; therefore, this control level is considered to be achieved in practice.

CARB's DG Certification Regulation allows operators of IC engines used to generate both heat and electric power to demonstrate compliance with the CO emissions standard of 0.02 lb/MW-hr by taking credit for the recovered thermal energy at the of one MW-hr for each 3.4 million Btus of heat recovered.

**Step 2 - Eliminate Technologically Infeasible Options**

After multiple discussions with engine manufactures it has been determined that the 0.02 lb-VOC/MW-hr (equivalent to 2 ppmv @ 15% O<sub>2</sub>) is not achievable by current engine builds, this was backed up by outreach and discussions with Orion system, Moser Energy Systems, and Western Energy Systems. In addition, engines in the San Joaquin Valley APCD are not subject to the California Distributed Energy (CDE) requirements and there are no engines currently permitted at that limit. Whereas some engines have source tested to meet that limit, the manufacturers do not believe the current builds could consistently achieve the limit for the life of the engine; this is in part due to the uncontrolled emissions from lean burn engines being on the order of 25 ppmv @ 15% O<sub>2</sub>, and to meet 2 ppmv @ 15% O<sub>2</sub> would require an oxidation catalyst to achieve over a 90% control whereas the current builds of oxidation catalysts cannot meet

those levels consistently through the entire life of the catalyst (Western Energy Systems). Likewise, HUG Engineering had stated that they would not be able to provide equipment that could provide a build that would both meet the NOx limit of 2.5 ppmv and the VOC limit of 2.0 ppmv with their current technology. In addition the CDE requirements are not part of any EPA approved State Implementation Plan (SIP). Therefore, the 0.02 lb-VOC/MW-hr standard is technologically infeasible.

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

Control Technology Ranking

Control Technology	Achieved in Practice
1. 0.10 lb-VOC/MW-hr  *When determining compliance with the lb/MW-hr NOx requirement, engines with heat recovery may include one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered (MW <sub>th</sub> -hr) in addition to each MW-hr of net electricity produced (MW <sub>e</sub> -hr)	Yes
2. Use of an engine meeting the following:  1. For all compression-ignited engines: 50 percent reduction of latest Tier standard for VOC emissions using a catalytic oxidation system.  2. For rich-burn spark-ignited engines: 12 ppmvd @ 15% O2 or 0.069 g/bhp-hr	Yes
3. Use of an engine meeting the following:  1. For all compression-ignited engines: Use of an engine meeting the latest Tier standard  2. For all spark-ignited engines: 25 ppmvd @ 15% O2 or 0.15 g/bhp-hr	Yes

**Step 4 - Cost Effectiveness Analysis**

The applicant has proposed the highest ranked control option above as demonstrated below.

**From the engine data sheet (See Appendix F):**

Electrical Power: 550 kW  
 Recoverable Thermal Output: 2.141 MMBtu/hr  
 Fuel Consumption: 4.627 MMBtu/hr

**Hourly Engine Output**

Engine Output = 550 kW = 0.550 MW  
 Thermal Output = 2.141 MMBtu/hr x MW/3.4 MMBtu/hr = 0.630 MW

Total MW Output = 0.550 MW + 0.630 MW = 1.18 MW/hr



### **Hourly Emissions**

$$\text{Pe Hourly} = \frac{4.627 \frac{\text{MMBtu}}{\text{hr}} \times 20 \text{ ppm} \times 8578 \frac{\text{dscf}}{\text{MMBtu}} \times 16 \frac{\text{lb}}{\text{lb} - \text{mol}} \times \frac{20.95}{20.95 - 15}}{379.5 \frac{\text{dscf}}{\text{lb} - \text{mol}} \times 10^6}$$

PE Hourly = 0.12 lb-VOC/hr

### **Engine Emissions (lb/MW-hr)**

Engine Emissions = 0.12 lb-VOC/hr ÷ 1.18 MW/hr = 0.10 lb-VOC/MW-hr

Since the applicant has proposed the highest ranked control option, a cost effectiveness analysis is not required.

### **Step 5 - Select BACT**

Pursuant to the above BACT Analysis, BACT for VOC emissions from each proposed engine is 0.10 lb-VOC/MW-hr which is demonstrated above to be equivalent to 20 ppmv @ 15% O<sub>2</sub>. The applicant has proposed an emission limit of 20 ppmv @ 15% O<sub>2</sub> for VOC for each engine. Therefore, the BACT requirements for VOC are satisfied for each engine.

**APPENDIX D**  
**HRA and AAQA Summary**

# San Joaquin Valley Air Pollution Control District

## Revised Risk Management Review and Ambient Air Quality Analysis

To: Jesse Garcia – Permit Services  
 From: Will Worthley – Technical Services  
 Date: April 21, 2021  
 Facility Name: VS DIGESTER  
 Location: 13749 MURPHY RD, ESCALON  
 Application #(s): N-9354-1-0, -2-0, -3-0, -4-0  
 Project #: N-1170108

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### 1. Summary

#### 1.1 RMR

Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required	Special Permit Requirements
1-0	3.57	0.00	0.00	3.04E-08	No	Yes
2-0	9.46	0.05	0.05	7.44E-07	No	Yes
3-0	9.46	0.05	0.05	7.45E-07	No	Yes
4-0	9.46	0.05	0.05	7.45E-07	No	Yes
<b>Project Totals</b>	>1	0.16	0.14	2.26E-06		
<b>Facility Totals</b>	>1	0.16	0.14	2.26E-06		

#### 1.2 AAQA

Pollutant	Air Quality Standard (State/Federal)				
	1 Hour	3 Hours	8 Hours	24 Hours	Annual
<b>CO</b>	Pass		Pass		
<b>NO<sub>x</sub></b>	Pass				Pass
<b>SO<sub>x</sub></b>	Pass	Pass		Pass	Pass
<b>PM10</b>				Pass	Pass <sup>4</sup>
<b>PM2.5</b>				Pass	Pass <sup>5</sup>
<b>Ozone</b>	Pass		Pass		

Notes:

- Results were taken from the attached AAQA Report.
- Flare is an intermittent source and was only evaluated for annual AAQA emissions standards.
- The project is an intermittent source as defined in APR-1920. In accordance with APR-1920, compliance with short-term (i.e., 1-hour, 3-hour, 8-hour and 24-hour) standards is not required.
- The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2) unless otherwise noted.
- Modeled PM10 concentrations were below the District SIL for non-fugitive sources of 1 µg/m<sup>3</sup> for the annual concentration.
- Modeled PM2.5 concentrations were below the District SIL for non-fugitive sources of 0.2 µg/m<sup>3</sup> for the annual concentration.

### 1.3 Proposed Permit Requirements

To ensure that human health risks will not exceed District allowable levels; the following shall be included as requirements for:

#### Unit # 1-0, 2-0, 3-0, & 4-0

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.

#### Unit # 1-0 (Flare)

1. This unit shall not exceed 200 hours per calendar year of operation.

## 2. Project Description

Technical Services received a revised request on April 20, 2021 to perform a Risk Management Review (RMR) and Ambient Air Quality Analysis (AAQA) for the following:

- Unit -1-0: COMPLETE MIX HYDROLYZER AND BEDDING ANAEROBIC DIGESTERS AND A COVERED ANAEROBIC DIGESTER, ONE 37.468 MMBTU/HR DIGESTER GAS-FIRED BACKUP FLARE, PERMIT EXEMPT BOILERS (NATURAL GAS-FIRED, 5 MMBTU/HR OR LESS), AND A DIGESTER GAS UPGRADING OPERATION CONSISTING OF FEED GAS BLOWERS, COMPRESSORS, COOLERS, CHILLERS, IRON SPONGE H<sub>2</sub>S REMOVAL, A MEMBRANE CO<sub>2</sub> REMOVAL SYSTEM, PRODUCT GAS COMPRESSORS, AND A 0.99 MMBTU/HR TRITON 4.95 NATURAL GAS-FIRED REGENERATIVE THERMAL OXIDIZER (RTO)
- Unit -2-0: 770 BHP 2G ENERGY MODEL AVUS 500PLUS NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM POWERING AN ELECTRICAL GENERATOR AND PROVIDING HEAT FOR THE DIGESTER SYSTEM
- Unit -3-0: 770 BHP 2G ENERGY MODEL AVUS 500PLUS NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM POWERING AN ELECTRICAL GENERATOR AND PROVIDING HEAT FOR THE DIGESTER SYSTEM
- Unit -4-0: 770 BHP 2G ENERGY MODEL AVUS 500PLUS NATURAL GAS-FIRED LEAN-BURN IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM POWERING AN ELECTRICAL GENERATOR AND PROVIDING HEAT FOR THE DIGESTER SYSTEM

## 3. RMR Report

### 3.1 Analysis

The District performed an analysis pursuant to the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, May 28, 2015) to determine the possible cancer and non-cancer health impact to the nearest resident or worksite. This policy requires that an assessment be performed on a unit by unit basis, project basis, and on a facility-wide basis. If a preliminary prioritization analysis demonstrates that:

- A unit's prioritization score is less than the District's significance threshold and;
- The project's prioritization score is less than the District's significance threshold and;

- The facility's total prioritization score is less than the District's significance threshold

Then, generally no further analysis is required.

The District's significant prioritization score threshold is defined as being equal to or greater than 1.0. If a preliminary analysis demonstrates that either the unit(s) or the project's or the facility's total prioritization score is greater than the District threshold, a screening or a refined assessment is required

If a refined assessment is greater than one in a million but less than 20 in one million for carcinogenic impacts (Cancer Risk) and less than 1.0 for the Acute and Chronic hazard indices (Non-Carcinogenic) on a unit by unit basis, project basis and on a facility-wide basis the proposed application is considered less than significant. For unit's that exceed a cancer risk of 1 in one million, Toxic Best Available Control Technology (TBACT) must be implemented.

Toxic emissions for this project were calculated using the following methods:

- Toxic emissions for this proposed unit were calculated using 2001 Ventura County's Air Pollution Control District's emission factors for Natural Gas Fired external combustion and based on the Dairy Biomethane characterization in Pipeline Quality Biomethane: North American Guidance Document for Introduction of Dairy Waste Derived Biomethane Into Existing Natural Gas Networks (2009).
- Toxic emissions for this proposed unit were calculated using 2000 AP42 emission factors for Natural Gas Fired internal combustion 4 Stroke Lean Burn Engine . (The use of a catalyst reduces TACs by 76% (NESHAP).

These emissions were input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy, risks from the proposed unit's toxic emissions were prioritized using the procedure in the 2016 CAPCOA Facility Prioritization Guidelines. The prioritization score for this proposed facility was greater than 1.0 (see RMR Summary Table). Therefore, a refined health risk assessment was required.

The AERMOD model was used, with the parameters outlined below and meteorological data for 2013-2017 from Stockton (rural dispersion coefficient selected) to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the SHARP Program, which then used the Air Dispersion Modeling and Risk Tool (ADMRT) of the Hot Spots Analysis and Reporting Program Version 2 (HARP 2) to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

<b>Source Process Rates</b>					
<b>Unit ID</b>	<b>Process ID</b>	<b>Process Material</b>	<b>Process Units</b>	<b>Hourly Process Rate</b>	<b>Annual Process Rate</b>
1	1	Flare Dairy Gas	MMscf	0.0646	12.92
1	2	RTO Dairy Gas	MMscf	0.01656	144.19
1	3	RTO Pilot Fuel	MMscf	0.00125	10.95
2	1	NG Usage	MMscf	0.004627	40.533
3	1	NG Usage	MMscf	0.004627	40.533
4	1	NG Usage	MMscf	0.004627	40.533

Point Source Parameters						
Unit ID	Unit Description	Release Height (m)	Temp. (°K)	Exit Velocity (m/sec)	Stack Diameter (m)	Vertical/ Horizontal/ Capped
1	Flare	4.94	811	11.89	1.46	Vertical
1	RTO Pilot Fuel	9.14	533	16.87	0.51	Vertical
1	RTO Waste Gas	9.14	533	16.87	0.51	Vertical
2	770 BHP NG ICE	10.06	393	16.24	0.27	Vertical
3	770 BHP NG ICE	10.06	393	16.24	0.27	Vertical
4	770 BHP NG ICE	10.06	393	16.24	0.27	Vertical

#### 4. AAQA Report

The District modeled the impact of the proposed project on the National Ambient Air Quality Standard (NAAQS) and/or California Ambient Air Quality Standard (CAAQS) in accordance with District Policy APR-1925 (Policy for District Rule 2201 AAQA Modeling) and EPA's Guideline for Air Quality Modeling (Appendix W of 40 CFR Part 51). The District uses a progressive three level approach to perform AAQAs. The first level (Level 1) uses a very conservative approach. If this analysis indicates a likely exceedance of an AAQS or Significant Impact Level (SIL), the analysis proceeds to the second level (Level 2) which implements a more refined approach. For the 1-hour NO<sub>2</sub> standard, there is also a third level that can be implemented if the Level 2 analysis indicates a likely exceedance of an AAQS or SIL.

The modeling analyses predicts the maximum air quality impacts using the appropriate emissions for each standard's averaging period. Required model inputs for a refined AAQA include background ambient air quality data, land characteristics, meteorological inputs, a receptor grid, and source parameters including emissions. These inputs are described in the sections that follow.

Ambient air concentrations of criteria pollutants are recorded at monitoring stations throughout the San Joaquin Valley. Monitoring stations may not measure all necessary pollutants, so background data may need to be collected from multiple sources. The following stations were used for this evaluation:

Monitoring Stations				
Pollutant	Station Name	County	City	Measurement Year
CO	HAZELTON-HD, STOCKTON	San Joaquin	Stockton	2018
NOx	HAZELTON-HD, STOCKTON	San Joaquin	Stockton	2018
PM10	HAZELTON-HD, STOCKTON	San Joaquin	Stockton	2018
PM2.5	HAZELTON-HD, STOCKTON	San Joaquin	Stockton	2018
SOx	Fresno - Garland	Fresno	Fresno	2018

Technical Services performed modeling for directly emitted criteria pollutants with the emission rates below:

Emission Rates (lbs/hour)						
Unit ID	Process	NOx	SOx	CO	PM10	PM2.5
1	1	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
1	2	0.03	0.01	0.10	0.009	0.009
2	1	0.01	0.01	0.93	0.01	0.01
3	1	0.01	0.01	0.93	0.01	0.01
4	1	0.01	0.01	0.93	0.01	0.01

1. Flare was not evaluated for 1, 3, 8, or 24 hour standards as the unit is intermittent and operation shall not exceed 200 hours in any calendar year.

Emission Rates (lbs/year)						
Unit ID	Process	NOx	SOx	CO	PM10	PM2.5
1	1	985	5,744	755	246	246
1	2	241	31	902	82	82
2	1	730	116	8107	122	122
3	1	730	116	8107	122	122
4	1	730	116	8107	122	122

The AERMOD model was used to determine if emissions from the project would cause or contribute to an exceedance of any state of federal air quality standard. The parameters outlined below and meteorological data for 2013-2017 from Stockton (rural dispersion coefficient selected) were used for the analysis:

The following parameters were used for the review:

Point Source Parameters						
Unit ID	Unit Description	Release Height (m)	Temp. (°K)	Exit Velocity (m/sec)	Stack Diameter (m)	Vertical/Horizontal/Capped
1	Flare	9.14	533	16.87	0.51	Vertical
1	RTO Pilot Fuel	4.94	811	11.89	1.46	Vertical
2	RTO Waste Gas	10.06	393	16.24	0.27	Vertical
3	770 BHP NG ICE	10.06	393	16.24	0.27	Vertical
4	770 BHP NG ICE	10.06	393	16.24	0.27	Vertical

## 5. Conclusion

### 5.1 RMR

The cumulative acute and chronic indices for this facility, including this project, are below 1.0; and the cumulative cancer risk for this facility, including this project, is less than 20 in a million. In addition, the cancer risk for each unit in this project is less than 1.0 in a million. **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 requirements 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.

## **5.2 AAQA**

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

## **6. Attachments**

- A. Modeling request from the project engineer
- B. Additional information from the applicant/project engineer
- C. Prioritization score w/ toxic emissions summary
- D. Facility Summary
- E. AAQA results



**APPENDIX E**  
**Quarterly Net Emissions Change (QNEC)**

## Quarterly Net Emissions Change (QNEC)

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

QNEC = PE2 - PE1, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.

PE2 = Post-Project Potential to Emit for each emissions unit, lb/qtr.

PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr.

Using the values in Sections VII.C.2 and VII.C.1 in the evaluation above, quarterly PE2 and quarterly PE1 can be calculated as follows:

$$PE2_{\text{quarterly}} = PE2_{\text{annual}} \div 4 \text{ quarters/year}$$

$$PE1_{\text{quarterly}} = PE1_{\text{annual}} \div 4 \text{ quarters/year}$$

<b>Quarterly NEC [QNEC] for N-9354-1-0</b>			
<b>Pollutant</b>	<b>PE2 (lb/qtr)</b>	<b>PE1 (lb/qtr)</b>	<b>QNEC (lb/qtr)</b>
NO <sub>x</sub>	172.75	0	172.75
SO <sub>x</sub>	663.50	0	663.50
PM <sub>10</sub>	48.50	0	48.50
CO	311.75	0	311.75
VOC	26.00	0	26.00

<b>Quarterly NEC [QNEC] for each N-9354-2-0, -3-0, -4-0</b>			
<b>Pollutant</b>	<b>PE2 (lb/qtr)</b>	<b>PE1 (lb/qtr)</b>	<b>QNEC (lb/qtr)</b>
NO <sub>x</sub>	182.50	0	182.50
SO <sub>x</sub>	29.00	0	29.00
PM <sub>10</sub>	30.50	0	30.50
CO	2,026.75	0	2,026.75
VOC	253.25	0	253.25

**APPENDIX F**  
**Engine Data Sheet**

## Technical specification

avus 500plus NG | ct80-1



Design:

**550 kW el.**

**60 Hz / 480 V**

**natural gas**

**Calorific Value = 990 BTU/ft<sup>3</sup>**

**NO<sub>x</sub> < 1.0 g/BHP-h**

**Exhaust cooling to 248 °F**

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Subject to technical changes!

Note: Figure on cover page may differ

## 1. Genset

	50 %	75 %	100 %	Load
Electrical power	275	413	550	kW <sup>(5)</sup>
Recoverable thermal output	1214	1624	2141	MBTU/hr <sup>(2)</sup>
Fuel consumption	2505	3553	4627	MBTU/hr <sup>(1)</sup>
Efficiency Electrical	37.5	39.6	40.6	% <sup>(1)</sup>
Efficiency Thermal	48.4	45.7	46.3	% <sup>(1), (2)</sup>
Efficiency Combined (el. + th.)	85.9	85.3	86.8	% (1), (2)

	NOx	CO	VOC <sup>(8)</sup>	
Exh. emissions without catalytic converter	< 1.0	< 2.0	< 0.7	g/BHP-h
	< 91	< 300		ppm <sup>(4), (6)</sup>
Exh. emissions with catalytic converter	< 1.0	< 0.6	< 0.7	g/BHP-h
	< 91	< 90		ppm <sup>(4), (6)</sup>

### 1.1 Engine

Engine manufacturer	2G		
Engine type	agenitor 412		
Type	V - Motor		
No. of cylinders	12		
Operating method	4-stroke		
Engine displacement	25007	ccm	
Bore	5.12	in	
Stroke	6.18	in	
RPM	1800	1/min	
ISO standard power (mech.)	770	bhp	
compression ratio	13 : 1		
average effective pressure	212.7	psi	
average piston speed	30.9	ft/s	
body of balance wheel	SAE 1		
Direction of rotation (based on balance wheel)	left		
tooth rim with number of teeth	137		
Engine dead weight	4740	lbs	
Mixture cooling to	122	°F	
Engine surface noise **	112	dB(A) <sup>(7)</sup>	
Engine surface noise with sound enclosure (optional) ***	70	dB(A) <sup>(7)</sup>	

\*\* Total sound power level at full engine load in accordance with DIN EN ISO 3746

\*\*\* Average sound pressure level under open area conditions at distance of 1 m in accordance with DIN 45635

An increased noise load must be taken into account with fresh air intake from the installation room.

## 1.2 Generator (utility planning data)

Manufacturer	Leroy Somer	
Type	LSA 49.3 M6/4p	
Generator type	Synchronous, directly coupled	
Voltage regulator (AVR)	D510C	
Rated speed	1800	1/min
Frequency	60	Hz
Effective electrical power	550	kW
Apparent electrical power (cos $\varphi$ 0.8)	688	kVA
Apparent electrical power (cos $\varphi$ 1.0)	550	kVA
Rated generator current (cos $\varphi$ 0.8)	827	A
Rated generator current (cos $\varphi$ 1.0)	662	A
Rated generator voltage ( $\pm$ 10 %)	480	V
Subtransient reactance X"d	11.1	%
Short-circuit current I <sub>k</sub> "3	9.3	kA
Power factor cos $\varphi$ (lagging / leading)	0.8 / 0.95	
Generator circuit breaker	1000	A
Additional section switch (VDE-AR-N 4105)	1000	A
Efficiency (full load) at Cos $\varphi$ = 1	95.8	%
Mass moment of inertia	251.07	lb · ft <sup>2</sup>
Ambient air temperature	104	°F
Stator circuit	star	
Protection class	IP 23	
Generator weight	4032	lbs
Compensation	not available	
Engine startup	not available	

## 2 Mixture composition

### 2.1 Combustion air

Combustion air mass flow	6476	lbs/hr
Combustion air volume flow (25 °C, 1013 mbar)	1460	SCFM

### 2.2 Fuel

Fuel requirements in accordance with 'TA-004 Gas'

Reference methane number - minimum methane number	80 / 80	
Combustible mass flow	234.1	lbs/hr <sup>(1)</sup>
Combustible volume flow	77.9	SCFM <sup>(6)</sup> (1)
Gas pressure at rated load min. *	0.435	psig
Gas flow pressure at rated load max. *	1.015	psig
Gas regulation line safety pressure	7.252	psig

\* At the inlet to the gas regulation line

### 3 Integrated heat extraction

#### 3.1 Customer Heat Recovery Circuit

Heating water requirements in accordance with 'TA-002 Heating circuit'

Heating water volume flow (at $\Delta t = 36$ °F)	118.7	gpm
Heating water return temperature (max)	158	°F
Heating water flow temperature (max) **	194	°F (9)
Safety valve	87.02	psi
Operating pressure (min.)	14.50	psi
Internal pressure loss in heating circuit (approx.) *	4	psig
Pressure reserve (approx.) *	8.70	psi

#### 3.2 Engine circuit

Coolant requirements in accordance with 'TA-001 Coolant'

Jacket Water Heat	791.3	MBTU/hr
Engine inlet temperature (min.)	176	°F
Engine outlet temperature (max.)	190	°F
Differential inlet / outlet (max.)	10.8	°F
Engine jacket water flow (min.)	170.2	gpm
Total cooling water circulation volume	276.2	gpm
Operating pressure (max.)	29.0	psi
Operating pressure (min.)	14.50	psi
Safety valve	43.5	psi
Safety temperature limiter	230	°F
Intercooler heat high temperature circuit	246.575	MBTU/hr
Intercooler inlet high water temperature (max.)	180	°F
Intercooler coolant flow high temperature circuit (min.)	106.1	gpm

#### 3.3 Mixture cooling water circuit - low temperature (LT)

Coolant requirements in accordance with 'TA-001 Coolant'

Intercooler heat low temperature circuit	175.487	MBTU/hr
Intercooler inlet low water temperature (max.)	100	°F
Intercooler outlet low water temperature (max.)	106	°F
Intercooler coolant flow low temperature circuit (min.)	75.5	gpm
Safety valve	44	psi

\* Up to / from module interface

\*\* Heating water supply temperature in partial load operation < 194 °F (9)



## 4. Exhaust system

Exhaust gas temperature after turbo charger	863	°F <sup>(3)</sup>
Exhaust temperature after exhaust heat exchanger	248	°F
Exhaust Gas Heat up to 248°F	1102.92	MBTU/hr
exhaust gas volume flow wet	1409	SCFM <sup>(6)</sup>
exhaust gas volume flow dry	1262	SCFM <sup>(6)</sup>
exhaust gas mass flow wet	6711	lbs/hr
exhaust gas mass flow dry	6239	lbs/hr
Exhaust back pressure downstream of turbine max.	0.73	psig
Pressure reserve approx. *	0.38	psig
Exhaust outlet noise **	130	dB <sup>(7)</sup>

## 5 Ventilation

Radiation heat of engine and generator (approx.)	306	MBTU/hr
Supply air volume flow min. (at $\Delta t = 27$ °F)	12098	SCFM

## 6 Operating fluids

Lubricating oil approvals, see 'TA-003 Lubricating oil'

Lubrication oil consumption (max.)	0.20	g/kWh
Filling capacity lubricant (max.)	23.78	gallons
Lubricating oil filling tank fill capacity (optional)	50.19	gallons
Lubricating oil volume extension tank (optional) (optional)	50.19	gallons
Coolant approvals, see 'TA-001 Coolant'		

## 7 Electronics and software

Generator Protection Relay	Bachmann GSP   optional redundant Relay SEL 700GT	
Touchscreen display	10	"
Protection class Control cabinet	Type 12	
Protection class Power switch cabinet	Type 1	
Switch cabinet environmental temperature	32 - 95	°F
Switch cabinet relative air humidity (max.)	65	%

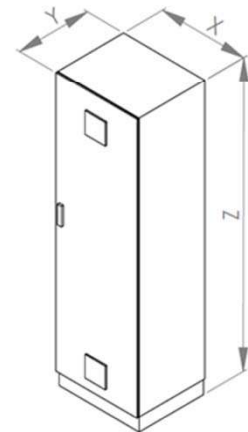
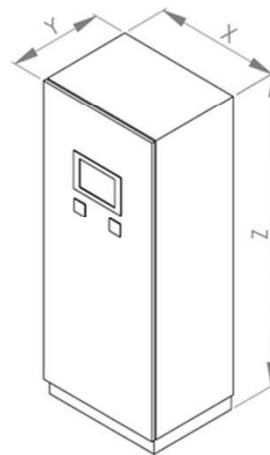
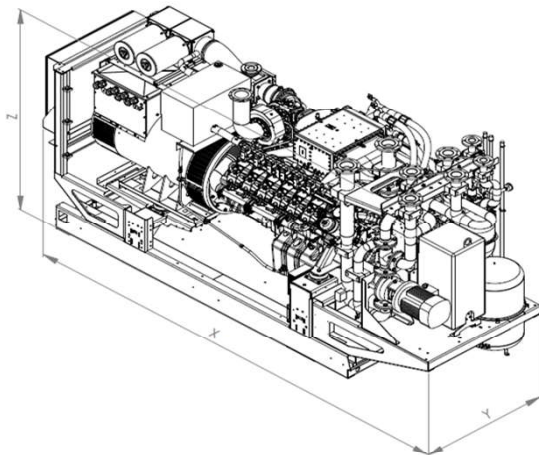
\* From module interface (exhaust heat exchanger / catalytic converter in standard version and new condition)

\*\* Total sound power level at full engine load in accordance with DIN 45635-11 Annex A

## 8 Interfaces

### 8.1 Dimensions and weights

(Figures may differ)



Length Module	X	178.94	in
Width Module	Y	51.57	in
Height Module	Z	86.61	in
Weight Module		13558	lbs
Weight Module with sound enclosure (optional)		16645	lbs
Powder-coated CHP frame		RAL 6002	
Width Control cabinet	X	31.50	in
Depth Control cabinet	Y	23.62	in
Height Control cabinet	Z	78.74	in
Weight Control cabinet		441	lbs
Control cabinet powder coated		RAL 7035	
Width Power switch cabinet	X	23.62	in
Depth Power switch cabinet	Y	23.62	in
Height Power switch cabinet	Z	78.74	in
Weight Power switch cabinet		331	lbs
Power switch cabinet powder coated		RAL 7035	

### 8.2 Mechanical Connections

Interface Gas	50 / 10	DN / PN
Interface Exhaust	/	DN / PN
Interface Heating circuit	80 / 16	DN / PN
Interface Emergency cooling circuit	80 / 16	DN / PN
Interface Mixture cooling circuit LT	50 / 16	DN / PN

### 8.3 Electrical connections / utility interface

Grid connection with pre-fuse (customer-provided)	60 Hz / 480 V	
Grid system	Y	
Short-circuit proof I <sub>cc</sub> (max.)	50	kA

### 8.4 Data interfaces

Remote maintenance access (optional) *	DSL / UMTS (SIM)	
Interfaces / Data interfaces (optional):	<ul style="list-style-type: none"> <li>- Profibus</li> <li>- Profinet</li> <li>- Modbus RTU</li> <li>- Modbus TCP</li> <li>- Ethernet IP</li> <li>- Hardware signals</li> </ul>	
Access virtual power plant (optional)	Possible after technical clarification (bus or hardware signals)	

\* Access for remote maintenance must be provided by the customer

## 9 Technical boundary conditions

Unless otherwise specified, all data is based on full engine load with the respective indicated media temperatures and subject to technical improvements. The generator output measured at the generator terminals serves as the basis for the delivered electrical power. All power and efficiency specifications are gross specifications. The fuel gas quality must conform to the specifications of 'TA-004 Gas'. The operating fluids and plant system layout must conform to the 'Technical instructions' of 2G.

- (1) Performance conditions in accordance with DIN ISO 3046. Tolerance for specific fuel use amounts to + 5% of nominal performance. Efficiency specifications are based on an engine in new condition. An abatement in efficiency over the service life is reduced with observance of the maintenance requirements.
- (2) The tolerance for usable heat output is +/- 8 % under normal load.
- (3) The tolerance for the exhaust temperature is +/- 8 %.
- (4) Corresponding to a residual oxygen concentration in the exhaust of 15 %.
- (5) Electrical generator terminal power at  $\cos \varphi = 1.0$
- (6) Volume specifications for normal status:
 

Pressure	14.69 psig
Temperature	32 °F
- (7) Standard deviation of reproducibility 4 dB in accordance with DIN EN ISO 3746
- (8) Assumed gas composition (VOC calculated as NMHC):  
 CH<sub>4</sub>=90 %, C<sub>2</sub>H<sub>6</sub>=3 %, C<sub>3</sub>H<sub>8</sub>=2 %, C<sub>4</sub>H<sub>10</sub>=0,5 %, CO<sub>2</sub>+N<sub>2</sub>=4,5 %

**Power specifications in this document relate to standard reference conditions.**

**Standard reference conditions in accordance with DIN ISO 3046-1:**

Air pressure	14.50 psig
Air temperature	77 °F
Relative air humidity	30 %

### Power reduction

Power reduction due to installation at altitude > 958ft a.s.l. and/or air suction temperature > 77°F shall be determined specifically for each project according "TI-049 Load reduction".