



San Joaquin Valley

AIR POLLUTION CONTROL DISTRICT



HEALTHY AIR LIVING™

JUL 17 2013

Matt Schmitt
Colony Energy Partners - Tulare, LLC
4940 Campus Drive, Suite C
Newport Beach, CA 92660

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: S-8153
Project Number: S-1130032

Dear Mr. Schmitt:

Enclosed for your review and comment is the District's analysis of Colony Energy Partners - Tulare, LLC's application for an Authority to Construct for the installation of two cogeneration (heat and electric) systems each equipped with 831 bhp MWM Model TCG 2016 V12 C lean burn natural gas-fired internal combustion (IC) engines each driving a 600 kW electrical generator served by two 41 MMBtu/hr Bekaert Model CEB 1200 digester gas-fired air-assisted ground level enclosed flares, at Paige Avenue (west of Enterprise Street) in Tulare, CA (S/2 Section 16, Township 20S, Range 24E Mount Diablo Base and Meridian).

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. After addressing all comments made during the 30-day public notice 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. Stanley Tom of Permit Services at (559) 230- 5900.

Sincerely,

David Warner
Director of Permit Services

DW:st

Enclosures

cc: Mike Tollstrup, CARB (w/ enclosure) via email

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: 661-392-5500 FAX: 661-392-5585

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

NOTICE IS HEREBY GIVEN that the San Joaquin Valley Unified Air Pollution Control District solicits public comment on the proposed issuance of Authority to Construct to Colony Energy Partners - Tulare, LLC for the installation of two cogeneration (heat and electric) systems each equipped with 831 bhp MWM Model TCG 2016 V12 C lean burn natural gas-fired internal combustion (IC) engines each driving a 600 kW electrical generator served by two 41 MMBtu/hr Bekaert Model CEB 1200 digester gas-fired air-assisted ground level enclosed flares, at Paige Avenue (west of Enterprise Street) in Tulare, CA (S/2 Section 16, Township 20S, Range 24E Mount Diablo Base and Meridian).

The analysis of the regulatory basis for this proposed action, Project #S-1130032, is available for public inspection at http://www.valleyair.org/notices/public_notices_idx.htm and at any District office. For additional information, please contact the District at (559) 230-6000. Written comments on this project must be submitted by August 21, 2013 to **DAVID WARNER, DIRECTOR OF PERMIT SERVICES, SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT, 1990 EAST GETTYSBURG AVENUE, FRESNO, CA 93726.**

San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Two Cogeneration Systems Consisting of Two Natural Gas-Fired IC Engines and Two
Digester Gas-Fired Flares

Facility Name: Colony Energy Partners – Tulare, LLC Date: June 19, 2013
Mailing Address: 4940 Campus Drive, Suite C Engineer: Stanley Tom
Newport Beach, CA 92660 Lead Engineer: Joven Refuerzo
Contact Person: Matt Schmitt
Telephone: (949) 842-4827
E-Mail: matt@colonyenergypartners.com
Application No: S-8153-1-1, '4-0, and '5-0
Project No: S-1130032
Deemed Complete: February 4, 2013

I. Proposal

Colony Energy Partners – Tulare, LLC (CEP) has requested Authority to Construct (ATC) permits for installation of an anaerobic digester system with a digester gas conditioning system and two 41 MMBtu/hr Bekaert Model CEB 1200 digester gas-fired air-assisted ground level enclosed flares and two cogeneration (heat and electric) systems each equipped with 831 bhp MWM Model TCG 2016 V12 C lean burn natural gas-fired internal combustion (IC) engines each driving a 600 kW electrical generator.

This facility was originally permitted in project S-1121205. The changes to the original proposal as proposed by the facility are summarized below:

S-8153-1-1

- Increase the digester gas production from 1.2 MMscf/day to 2.0 MMscf/day. The digester gas will be no longer used to feed the power generation engines. The digester gas will be sent to the Southern California Gas Company pipeline grid and also used for vehicle fuel.
- The hydrogen sulfide (H₂S) removal system will no longer incorporate an in-tank bio-scrubber. This change is necessary as the digester gas that will be sent to Southern California Gas Company must be of a certain quality and composition. The in-tank bio-scrubber would introduce impurities into the digester gas, including nitrogen and carbon dioxide, which would be difficult to remove. The iron sponge alone will achieve the 40 ppmv H₂S permit limit.

- The original 41 MMBtu/hr Bekaert Model CEB 1200 digester gas-fired flare does not have enough capacity to handle the increased digester gas production. The facility is proposing to install a second identical 41 MMBtu/hr Bekaert Model CEB 1200 digester gas-fired flare.
- An additional system is proposed to be installed as part of the digester gas production operation. This system is called Greenlane Biogas Upgrading System and will be placed at the end of the gas production operation. The Greenlane Biogas Upgrading System upgrades raw digester gas through the removal of CO₂, H₂S, siloxanes and other soluble gases to produce methane gas (~98%) which is clean and dry. The gas process comprises of gas compression, gas upgrading, and gas drying operations.
- The final biosolids operation will now pasteurize the biosolids cake. This process step will be an indirect heat transfer system using waste heat from the engines. This drying process is required to destroy pathogens in the biosolid prior to direct loading into trucks for off-site processing or land application (fertilizer). The gas and odors from the biosolid heating tank and from the gas conditioning stripping column will be controlled by one biofilter equipped with a stack. A second biofilter not equipped with a stack (area source) will control emissions from the receiving pit.

The two 2,165 bhp digester gas/natural gas-fired engines listed on ATC permits S-8153-2-0 and '3-0 will not be installed if the 831 bhp natural gas-fired engines in this project are installed. Therefore, the following condition will be listed on ATCs S-8153-4-0 and '5-0 in this project:

- Upon implementation of the modification and startup of the equipment authorized by this Authority to Construct (ATC), ATCs S-8153-2-0 and '3-0 shall be cancelled. [District Rule 2201]

The equipment listed on ATC S-8153-1-0 will not be installed if the 831 bhp natural gas-fired engines in this project are installed. Therefore, the following condition will be listed on ATC S-8153-1-1 in this project:

- Upon implementation of the modification and startup of the equipment authorized by this Authority to Construct (ATC), ATC S-8153-1-0 shall be cancelled. [District Rule 2201]

The natural gas-fired IC engines will create electricity for use at the plant and the waste heat will be used for the anaerobic digestion process and solids heating.

This facility will not be a major source for any pollutant.

II. Applicable Rules

Rule 2201	New and Modified Stationary Source Review Rule (4/21/11)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4002	National Emissions Standards for Hazardous Air Pollutants (5/20/04)

Rule 4101 Visible Emissions (2/17/05)
Rule 4102 Nuisance (12/17/92)
Rule 4201 Particulate Matter Concentration (12/17/92)
Rule 4311 Flares (6/18/09)
Rule 4565 Biosolids, Animal Manure, and Poultry Litter Operations (3/15/07)
Rule 4566 Organic Material Composting Operations (8/18/11)
Rule 4701 Internal Combustion Engines (8/21/03)
Rule 4702 Internal Combustion Engines – Phase 2 (8/18/11)
Rule 4801 Sulfur Compounds (12/17/92)
CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notice
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

II. Project Location

The facility is located at Paige Avenue (west of Enterprise Street) in Tulare, CA (S/2 Section 16, Township 20S, Range 24E Mount Diablo Base and Meridian). The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

III. Process Description

CEP is proposing to construct and operate a digester gas plant in Tulare, CA. The plant will consist of two anaerobic digesters that will process incoming organic materials (substrates) and produce digester gas and digestate. The facility will operate 24 hours per day and 365 days per year.

Organic Material Delivery

The proposed facility will continuously receive organic material (substrates) in both liquid and solid form. All solid unloading will happen in the enclosed solid reception bunker under slight negative pressure. The liquid unloading will take place through two hose connections located at the side of the solid reception building. The trucks will connect their content outlet to the appropriate hose for the delivery of the liquids into the reception tanks.

Liquid Feedstock

Liquid feedstocks will be delivered to the site by waste haulers. Operators will drive their trucks to the liquid reception area and dock. The truck operator will proceed to the discharge coupling protruding from the building wall. Hanging on the wall beside the tee will be a variety of flexible hoses with different sizes of cam and groove couplings to accommodate different discharge valves. The truck operator will activate the liquid organics pump to allow the feedstock to flow to its destination storage tank selected by the plant operator upon receipt of the manifest from the truck operator. Any inadvertently

spilled organics will be immediately washed from the concrete and contained area by the truck operator into floor drains which are plumbed to the reception pit.

Solid Feedstock

Solid feedstocks will be delivered to the site by waste haulers. Truck operators will back their trucks up to the solid reception building and await the plant operator to open the exterior door of the building. Once open, the truck operator will reverse the truck into the solid reception building until he has clearance to close the exterior door. The plant operator will open the hydraulic lid of the underground pit to receive the incoming solid organic feedstock. The truck operator will tip the truck box or activate the walking floor mechanism to empty the load of solid organic feedstock into the reception pit.

Odor emissions are mitigated in the solid feedstock offloading area by using an air lock system. Conveyors handling the solids will also be covered, preventing direct exposure to the atmosphere at any time.

The air lock system ensures that the feedstock processing will not be directly exposed to the atmosphere at any time by using interior and exterior doors. When a truck arrives to unload feedstock, it will enter the exterior set of doors and the interior doors will be closed. Once the truck is between the two sets of doors, the exterior doors will close and the interior doors will open to allow access to the unloading area. Upon exit, the exterior door is only permitted to open when a) all interior doors and/or the reception pit cover is closed; and b) 15 minutes have passed since the last closing of the interior door.

This system will ensure that all potential odors that have migrated to the area between the interior and exterior doors will have been ventilated to the air duct. This air is directed to the cogeneration engines for combustion. The delay of 15 minutes is based on a circulation rate of four air changes per hour. The delay allows for truck inspection, washing of tires, area cleanup, and completion of administrative duties with the plant operator.

Feedstock Pre-Treatment

Pre-treatment of organic feedstock is intended to render all materials received into a form that is pumpable and compatible with the anaerobic digestion system. All pre-treatment will happen prior to materials entering the reception tanks. Examples of pre-treatment include: 1) chopping – fine size reduction of organic materials and 2) dilution – addition of process and/or condensate and/or treated water to substrates. Solid organic feedstock will be tipped into the below ground reception pit. The below ground reception pit will be outfitted with a mixer and a chopper pump. The pumping system will include a recirculation loop to allow for the reduction of large particles into smaller ones; smaller particles make for easier pumping and expose more surface area for more thorough digestion. The slurry will be pumped into a bio-separator which will capture and remove debris such as plastic, stones, etc. that may be entrained in the solid organic feedstocks. A centrifugal force will allow the lighter particles to be screened off and send to a loadout bin.

Feedstock Storage

The feedstocks that arrive in the facility are separated in categories depending upon the physical composition and compatibility. Based on this categorization the incoming substrates of each category will arrive at the facility throughout the year and will be stored in separate storage tanks. There will be two reception tanks used for receiving the feedstock, and a dilution water tank used for receiving Filtrate that will be used for diluting the feedstock when necessary.

The hard top reception tanks will be constructed above grade with completely sealed wall surface that is water tight and air tight. The dilution water tank is a pre-manufactured tank.

All feedstock storage tanks will have one liquid inlet above the liquid level, and two liquid outlets below the liquid level; one for transferring the feedstock to the anaerobic digestion system; the other for evacuation during shutdown or emergency.

Internally, the reception tank will contain mixers to avoid any probability of solids or sediments settling in these tanks. Flangeless hot water piping will be installed around the circumference of the tank to heat the feedstock (cheese whey permeate and fat, oil, and grease). A hot water circuit (obtained from the cogeneration engines) goes through the piping; the same type of system is used to heat the digesters, reception tanks, and desulfurization unit. Through continuous monitoring of temperature and level, with instruments installed in the tank and read by the PLC, tank temperature and level are regulated accordingly, to avoid mixing and pumping issues.

Digester

The anaerobic digestion of the substrate occurs in the digester tanks. Each digester is identical in construction. The inner ring where the final digestion process will occur will be constructed of a dual layer flexible membrane. The outer and inner ring of each digester will be mixed with submersible hydraulic mixers which ensure thorough mixing and homogenization of incoming feedstock and substrates in the digesters.

In the engine building, plate heat exchangers (one per engine) will transfer the jacket water heat from the engines to the digesters hot water circuit. The heat will then be transferred from the pipes surrounding the inner walls of the digester's rings to the digesting feedstock providing the appropriate temperature to the naturally present microorganisms which are responsible for the anaerobic digestion.

In order to maintain mesophilic temperature range in the digesters, the rings will be insulated. The malodorous compounds within the organic substrate, known as volatile organic acids (e.g. acetic acid, propanoic acid, butanoic acid) are what the anaerobic microorganisms (methanogenic bacteria) eventually consume to produce digester gas. In the process of digesting these volatile organic acids odors are minimized. The hydraulic retention time inside the digesters is between 25 and 35 days. The hydraulic retention time is a measure of the average time that one unit of feedstock (organic matter) remains within the digester.

The digester gas production from the input substrates is optimized through the anaerobic digestion system. The outer ring is used as a primary digester, for introduction of the feedstock, and the inner ring is used as a secondary digester. The biological anaerobic digestion of the feedstock will first take place in the outer ring producing digester gas as a result of the process. The partly digested feedstock is then conducted to the inner ring where further anaerobic digestion occurs yielding additional digester gas from the feedstock.

The dual layer flexible membrane of the inner rings allows mixing and storage of the digester gas produced. The inner membrane has a special coating for gas tightness and gas resistance and the outer membrane is UV-stabilized. Each cover includes a dedicated air blower that keeps the external membrane inflated which the internal membrane fluctuates in position based on the digester gas production and the digester gas use (i.e. differential pressure). A level transducer mounted in the outside membrane tracks the relative position of the internal membrane. A methane detector is provided at the backpressure valve air outlet of the inter-membrane space. The methane sensor measures methane content in the existing air and alarms at present methane concentrations. This security system indicates if there is a leak in the internal membrane. The membrane will have low permeability, preventing the release of odors or gaseous compounds to the atmosphere.

Each digester is equipped with a pair of flash-back (flame) arresters and pressure/vacuum relief valves connected to the digester roof piped in parallel with a three-way manual change over valve installed in the common supply piping so that there shall be only one of the flash-back arrester and pressure/vacuum relief valves in effective service at all times.

Buffer Storage Tank

Digestate, the remainder of the substrates following anaerobic digestion, is pumped intermittently from each digester to the buffer storage tank. The roof will consist of a dual layer flexible membrane. The buffer storage tank has two submerged mixers to prevent settling of solids.

This tank provides additional residence time required for the digestate, thus greatly reducing the likelihood of undigested organic matter leaving the system. The buffer storage allows degasification and liberates the entrapped gases thereby reducing the odor level of post-digestion handling to an almost undetectable level, and prevents the unwanted release of methane during the next stage of pressing (i.e., composting or land application). Furthermore, the buffer storage tank provides capacity to handle any scheduled and unscheduled maintenance situation for downstream process equipment such as solid separation or wastewater treatment.

The buffer storage tank also provides for digester gas storage in its double membrane gas holder roof. The inner membrane has a special coating for gas tightness and gas resistance and the outer membrane is UV-stabilized. Each cover includes a dedicated air blower that keeps the external membrane inflated, which the internal membrane fluctuates in position base on gas production as gas use (e.g. differential pressure). A level

transducer mounted in the outside membrane tracks the relative position of the internal membrane. A methane detector is provided at the backpressure valve air outlet of the inter-membrane space. The methane sensor measures methane content in the existing air and alarms at present methane concentrations. This security system indicates if there is a leak in the internal membrane.

The buffer storage tank is equipped with a pair of flash-back (flame) arresters and pressure/vacuum relief valves connected to the digester roof piped in parallel with a three-way manual change over valve installed in the common supply piping so that there shall be only one of the flash-back arrester and pressure/vacuum relief valves in effective service at all times.

The buffer storage tank acts as a digestate storage and volume buffering tank. Depending on the digestate management strategy, digestate may be processed intermittently, therefore the tank is large enough to provide several days of storage.

Digester Gas Conditioning

The Greenlane Biogas Upgrading System will accept raw digester gas from a receiving pit which is controlled by a biofilter not equipped with a stack (area source). The raw digester gas is sent into a compressor driven by an electric motor, where the raw digester gas is compressed to a pressure suitable for processing. It will then be sent to a scrubbing vessel for water scrubbing, a flash vessel for methane recovery, and a stripping vessel for regeneration of the process water. The drying system will then dry the upgraded gas after the scrubbing vessel. Waste gas from the stripping vessel will incorporate a biofilter equipped with a stack to control H₂S gas.

The digester gas flows through an inlet separator to a stage one compressor. The compression process is two stage, complete with inter and after-cooling via water-cooled shell and tube heat exchangers. Temperature, pressure and level instrumentation monitor operation and provide control and safe operation. Discharge check valves are provided to prevent reverse flow of digester gas when the system is stopped.

A condensate collector vessel and coalescing filter follow the stage one and two discharge coolers respectively. These devices collect and remove condensate and compressor lube oil from the digester gas. The condensate collectors also act as receivers for the gas recovered from the flashing vessel. The coalescing filter discharge and scrubbing vessel weir decant drain lines are also connected to this collector vessel.

After compression, the digester gas enters the bottom of the scrubbing vessel. Inside the vessel the digester gas rises to the top, which is counter-flow to the process water flowing downwards. The water preferentially absorbs the more soluble gases such as CO₂ and H₂S. Product gas, which is now almost pure CH₄, exists from the top of the vessel. Packing balls and distributors inside the scrubbing vessel provide increase surface contact area between the gas and water to maximize absorption efficiency.

After the scrubbing vessel the product gas passes through an adsorber. The molecular sieve media in the drier vessels adsorbs moisture and further purifies the product gas. The

dried product gas passes through a filter and a pressure control valve, before being discharged at the skid boundary. The control valve maintains a steady set pressure at the scrubbing vessel, thus ensuring consistent CO₂ and H₂S adsorption.

For the air stripper, air is drawn through an air filter and inverted U-bend before entering the base of the stripping vessel. The inverted U-bend prevents water from discharging through the stripping air inlet in the event of vessel flooding. Inside the vessel, the air is drawn upwards in counter-flow to the water flowing downwards. The air strips the dissolved CO₂ and H₂S out of the water and the air/gas mixture exists from the top of the vessel. Stripping air/gas is discharged continuously during operation, regardless of the operating capacity. This stream contains air, CO₂, H₂S, and other gases. The air/gas mixture is discharged to a biofilter equipped with a stack.

Digester Gas Desulfurization Unit

Hydrogen sulfide (H₂S) is present in the digester gas produced during anaerobic digestion due to the degradation of proteins and other sulfur containing compounds present in the feedstock. In the cogeneration engines, H₂S reacts with water to form sulfuric acid (H₂SO₄) which is highly corrosive.

An external physical contact scrubber (iron sponge) is integrated into the process design to effect H₂S reduction.

External H₂S removal will be effected with an iron sponge system. Iron sponge is a non-renewable method of removing H₂S. The H₂S reacts with the iron to form iron sulfide. The iron sponge consists of wood shavings or wood chips impregnated with hydrated iron oxide. Exposure of H₂S to mercaptans produces iron sulfides and iron mercaptides. The chemical process of H₂S removal with the iron sponge produces iron sulfides.



The process occurs after gas/liquid separation and prior to the dehydration process. For the iron sponge to effectively perform, 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 digester gas or digester gas. Therefore, no water spray is required for a digester gas application. Excess water is well tolerated by the iron sponge as long as the excess is drained off so as not to flood the bed. Also, the reaction of iron oxide with H₂S produces water contributing to proper hydration. The moisture drained is collected in the condensate tank and used for process dilution in the front end of the process along with other condensate.

Iron oxide impregnated into the wood surface will not wash off or migrate with the gas. If the iron sponge has dried in storage it can be re-wet and remain effective. A maximum temperature 120 degrees F should not be exceeded. The minimum temperature is 50 degrees F, or whatever is necessary to avoid hydrate formation relative to the system pressure and composition of the digester gas. The iron sponge reaction is not pressure sensitive and is not affected by other gas constituents.

The equipment needed for iron sponge treatment consists of a vessel which is filled with iron oxide. The gas is passed down flow with the H₂S removed to meet the designed 40 ppmv requirement until the iron sponge is exhausted. The sponge is then either revived or replaced. For continuous operation there will be an alternate vessel provided (standby unit) all piped to operate the process without any interruption. Valves can be arranged so either bed can operate while the other is serviced. The system is total enclosed and there is no potential of leaks. The multi stage method of desulfurization is capable of reducing H₂S levels in the digester gas from 1,500 ppm down to between 10 and 50 ppm.

Digestate Management System

The digestate that leaves the buffer storage tank will be low solid organic slurry that shall be dewatered by filter screw press(es). The press will separate the digestate into liquid and solid fractions. The liquid fraction (filtrate) is sent to a Dissolved Air Floatation (DAF) unit for further solid separation. The solids removed from the DAF unit are dewatered using a horizontal decanter/centrifuge. The solids fraction of the digestate has a commercial value and shall be sold as a byproduct. All process liquid effluent, meeting specified discharge requirements, will be directed to the Tulare Industrial WWTP for further treatment.

A feed pump will be used to transfer digestate from the buffer holding tank to the filter screw press. The flow to the press will be monitored and controlled using a Magmeter. The press will be elevated and dewater solids and will discharge by gravity to a solids pad directly below.

The liquid effluent from the filtrate will flow by gravity to an intermediary tank from which it will be pumped to a DAF system. Polymer is added to the DAF influent to promote flocculation and removal of suspended solids. The polymer system doses polymer based on the DAF influent rate measured using a Magmeter. Through primary and secondary solid separation with a filter screw press and DAF of the passage, suspended solids are significantly reduced to < 0.5% total solids. The float from the DAF is collected and pumped to a centrifuge for further dewatering. The dewatered solids fall by gravity to the solids pad to be combined with the press cake from the filter screw press for sale as compost. Clarified effluent from both the DAF and centrifuge is discharged directly to the Tulare Industrial WWTP for further treatment.

The polymer make down system will utilize a dry polymer which is diluted and aged prior to dosing into the DAF system. The dry polymer is supplied in bead-form (crystals) which eliminates dust while handling. The beads are packaged in small 25 kg bags from which the operator transfer them to a polymer hopper. The polymer make down system will use a vacuum polymer unloading and conveying system to transfer powder into the polymer mixing system for dilution with water. An air blower will transfer the polymer via a venture educator to a wetting head above the polymer mixing tank. The system utilizes totally enclosed conveying, mixing and storage units.

Digester Gas Flare

The flare will combust the digester gas produced by the facility during the commissioning period as the digester gas may have not yet reached the adequate quality to send to the pipeline.

Natural Gas-Fired Cogeneration Engines

The natural gas-fired IC engines will create electricity for use at the plant and the waste heat will be used for the anaerobic digestion process and solids heating to destroy pathogens in the biosolids prior to be sold as fertilizer.

V. Equipment Listing

S-8153-1-1: DIGESTER GAS PRODUCTION OPERATION CONSISTING OF ONE MANURE RECEPTION TANK, ONE DILUTION TANK, ONE FAT, OIL, GREASE, VEGETABLE WASTE RECEPTION TANK, ONE MIXING (FEED) TANK, TWO ANAEROBIC DIGESTER TANKS, ONE DIGESTATE (BUFFER) HOLDING TANK, DIGESTER GAS TREATMENT SYSTEM CONSISTING OF A CHILLER, COMPRESSOR, IRON SPONGE SCRUBBER, AND TWO 41 MMBTU/HR BEKAERT MODEL CEB 1200 DIGESTER GAS-FIRED AIR-ASSIST GROUND LEVEL ENCLOSED FLARES AND DIGESTATE MANAGEMENT SYSTEM CONSISTING OF ONE FILTER SCREW PRESS WITH ONE OVERFLOW BUFFER TANK, ONE SCREW PRESS BUFFER TANK, A POLYMER MAKE-DOWN SYSTEM, A DISSOLVED AIR FLOATATION (DAF) SYSTEM, ONE DIGESTATE BY-PRODUCT LOADOUT STATION, AND ONE BIOSOLIDS HEATING TANK AND TWO BIOMETHANE UPGRADING SYSTEMS EACH CONSISTING OF GAS COMPRESSORS, WATER SCRUBBING VESSEL, FLASH VESSEL, DRIER/PURIFIER VESSEL, AIR STRIPPING VESSEL SERVED BY A BIOFILTER, AND RECEIVING PIT SERVED BY A SECOND BIOFILTER

S-8153-4-0: 831 BHP MWM MODEL TCG 2016 V12 C LEAN BURN NATURAL GAS-FIRED IC ENGINE WITH TURBOCHARGER, INTERCOOLER, AIR/FUEL RATIO CONTROLLER, POSITIVE CRANKCASE VENTILATION, AND SELECTIVE CATALYTIC REDUCTION WITH UREA INJECTION COGENERATION SYSTEM

S-8153-5-0: 831 BHP MWM MODEL TCG 2016 V12 C LEAN BURN NATURAL GAS-FIRED IC ENGINE WITH TURBOCHARGER, INTERCOOLER, AIR/FUEL RATIO CONTROLLER, POSITIVE CRANKCASE VENTILATION, AND SELECTIVE CATALYTIC REDUCTION WITH UREA INJECTION COGENERATION SYSTEM

VI. Emission Control Technology Evaluation

S-8153-1-1

Iron Sponge

An external physical contact scrubber (iron sponge) is integrated into the process design to effect H₂S reduction of the digester gas. The equipment needed for iron sponge treatment consists of a vessel which is filled with iron oxide. The gas is passed down flow with the H₂S removed to meet the designed 40 ppmv requirement until the iron sponge is exhausted. The sponge is then either revived or replaced. For continuous operation there will be an alternate vessel provided (standby unit) all piped to operate the process without any interruption. Valves can be arranged so either bed can operate while the other is serviced. The system is total enclosed and there is no potential of leaks. The multi stage method of desulfurization is capable of reducing H₂S levels in the digester gas from 1,500 ppm down to between 10 and 50 ppm.

Biofilter

When applied to air filtration and purification, biofilters use microorganisms to remove air pollution. They are reactors in which humid polluted air streams are passed through a porous packed bed. The media provides a large surface area for the absorption and adsorption of contaminants. The media also serves as a nutrient source for the microbial population and creates situations for air to meet its specific empty bed residence time (EBRT) requirements. The empty bed residence time is the empty bed filter volume divided by the airflow rate, is a very common term used to describe biofilters, because it readily allows one to estimate the filter size for a given airflow.

$EBRT = V_f/Q$, where V_f is the filter bed volume (m^3) and Q the airflow rate (m^3/s)

The air flows through a packed compost and rot wood media/bed and the pollutant transfers into a thin biofilm on the surface of the packing material. The elimination of the gaseous pollutants is the result of a complex combination of different physicochemical and biological phenomena. Microorganisms, including bacteria and fungi are propagated and immobilized in the biofilm and degrade the influent pollutant (typically mixed VOCs and various sulfur compounds, including hydrogen sulfide). These fungi and bacteria feed on the VOCs and other odor-causing organics to metabolize and neutralize the organic compounds.

Contaminated air is moistened by a humidifier and is pumped into the biofilter through a chamber below the filter medium. While the air slowly flows upward through the filter media, the contaminants in the air stream are absorbed and metabolized. The purified air passes out of the top of the biofilter and into the atmosphere. The biofilter can efficiently treat odor, VOCs, and H₂S at an efficiency of 99%. The moist filter medium provides physical and chemical conditions appropriate for the transfer of contaminants from the air to the liquid phase and the biodegradation of the contaminants in the biofilm layer. The mechanisms of the biofiltration process includes a combination of adsorption, absorption,

and microbial degradation. Microorganisms contained in the biofilm layer continually metabolize the contaminants, as they are absorbed, converting them ultimately to water, carbon dioxide and salts.

Flare

The digester gas-fired enclosed flares proposed in this project has the potential to emit NO_x, SO_x, PM₁₀, CO, and VOC emissions due to the incineration of digester gas generated by the anaerobic digester system. The enclosed flares use a digester gas-fired automatic ignition pilot.

S-8153-4-0 and '5-0

The engines are equipped with:

- Turbocharger
- Intercooler
- Positive Crankcase Ventilation (PCV)
- Air/Fuel Ratio Controller
- Lean Burn Technology
- Selective Catalytic Reduction

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

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

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

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

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

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

VII. General Calculations

A. Assumptions

- Operation schedule = 24 hr/day and 365 days/year (per applicant)
- Digester gas heating value = 600 Btu/scf (per applicant)
- Natural gas heating value = 1000 Btu/scf (District Practice)
- Digester gas F-factor = 9,100 dscf/MMBtu (per applicant)
- Natural gas F-factor (adjusted to 60 °F) = 8,578 dscf/MMBtu (40 CFR 60 Appendix B)
- Post desulfurization unit digester gas H₂S concentration = 40 ppmv (per applicant based on BACT limit and four hour averaging period)
- Natural gas sulfur concentration = 1.0 gr-S/100 scf or 0.00285 lb-SO₂/MMBtu (District Policy APR 1720)

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- Maximum flare digester gas flow rate (each flare) = 41,667 scf/hr, 1,000,000 scf/day, 36.5 MMscf/year (per applicant)
- Maximum air stripper/biofilter waste gas flow rate = 1,840 scf/min (per applicant)
- Maximum receiving pit open biofilter waste gas flow rate = 1,440 scf/min (per applicant)

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- Engine exhaust flow rate = 1,686.85 cfm (per manufacturer)
- Engine natural gas fuel consumption rate = 4,975 scf/hr (based on manufacturer specification sheet of 4,975 MBtu/hr x scf/1000 Btu)
- BHP to Btu/hr conversion: 2,542.5 Btu/bhp-hr
- Thermal efficiency of engine: commonly ≈ 35%

B. Emission Factors

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Air Stripper/Biofilter

Controlled Waste Gas Sulfur Content		
Pollutant	ppmv	Source
H ₂ S (Uncontrolled)	2,000	Per Applicant
H ₂ S (Controlled)	7.0	Per Applicant

Receiving Pit Open Biofilter

Controlled Waste Gas Sulfur Content		
Pollutant	ppmv	Source
H2S (Uncontrolled)	200	Per Applicant
H2S (Controlled)	2.0	Per Applicant

Flare

The flare will only be fired on digester gas fuel at all times.

Commissioning SOx Emission Factors Digester Gas Fuel (Each Flare)		
Period	ppmvd in Fuel Gas	lb/MMBtu
First 30 days of Commissioning Period	4,000	1.124
Next 15 days of Commissioning Period	2,500	0.70
Final 15 days of Commissioning Period	1,000	0.281
Stable Performance, Final Sulfur Content Limit after 60 days for Commissioning	40	0.0112

$$\left(\frac{1000 \text{ ft}^3 - \text{H}_2\text{S}}{10^6 \text{ ft}^3 - \text{fuel}} \right) \left(\frac{\text{lb} - \text{mol H}_2\text{S}}{379.5 \text{ scf H}_2\text{S}} \right) \left(\frac{\text{lb} - \text{mol SO}_2}{\text{lb} - \text{mol H}_2\text{S}} \right) \left(\frac{64 \text{ lb SO}_2}{\text{lb} - \text{mol SO}_2} \right) \left(\frac{\text{scf fuel}}{600 \text{ Btu}} \right) = 0.281 \frac{\text{lb} - \text{SO}_2}{\text{MMBtu}}$$

Steady State Digester Gas Fuel (Each Flare)		
Pollutant	lb/MMBtu	Source
NO _x	0.03	Manufacturer Guarantee
SO _x	0.0112	Mass balance equation below based on BACT limit of 40 ppmv H2S in fuel and four hour averaging period
PM ₁₀	0.008	Manufacturer Guarantee
CO	0.30	Manufacturer Guarantee
VOC	0.068	Manufacturer Guarantee

$$\text{SO}_x = \frac{\left(41,667 \frac{\text{ft}^3 - \text{fuel}}{\text{hr}} \right) \left(\frac{40 \text{ ft}^3 - \text{H}_2\text{S}}{10^6 \text{ ft}^3 - \text{fuel}} \right) \left(34 \frac{\text{lb} - \text{H}_2\text{S}}{\text{lb} - \text{mol}} \right)}{\left(379.5 \frac{\text{ft}^3 - \text{H}_2\text{S}}{\text{lb} - \text{mol}} \right) \left(\frac{34 \text{ lb} - \text{H}_2\text{S}}{32 \text{ lb} - \text{S}} \right) \left(\frac{32 \text{ lb} - \text{S}}{64 \text{ lb} - \text{SO}_2} \right)}$$

SO_x = 0.28 lb/hr

SO_x = 0.28 lb/hr + (41,667 scf/hr x 600 Btu/scf) x 1E6/MM = 0.0112 lb/MMBtu

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

Natural Gas Fuel (Each Engine)			
Pollutant	g/hp-hr	ppmv @ 15% O2	Source
NO _x	0.108	9	Manufacturer Guarantee
SO _x	0.0094	--	Mass Balance Equation Below
PM ₁₀	0.033	--	AP-42 (7/00) Table 3.2-2*
CO	0.60	82.4	Manufacturer Guarantee
VOC	0.15	36.1	Manufacturer Guarantee

$$0.00285 \frac{\text{lb} - \text{SO}_x}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{1,000,000 \text{ Btu}} \times \frac{2,542.5 \text{ Btu}}{\text{bhp} - \text{hr}} \times \frac{1 \text{ bhp input}}{0.35 \text{ bhp out}} \times \frac{453.6 \text{ g}}{\text{lb}} = 0.0094 \frac{\text{g} - \text{SO}_x}{\text{bhp} - \text{hr}}$$

* PM10 value includes both filterable (7.71×10^{-5} lb/MMBtu) and condensable (9.91×10^{-3} lb/MMBtu) emissions.

C. Calculations

1. Pre-Project Potential to Emit (PE1)

The equipment proposed in this project will be treated as new emission units. Therefore, PE1 = 0.

2. Post Project Potential to Emit (PE2)

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Air Stripper/Biofilter Emissions

$$\begin{aligned} \text{Daily H2S Emissions} &= 1,840 \text{ scf-waste gas/min} \times 7.0 \text{ scf-H2S}/10^6 \text{ scf-waste gas} \times \\ &\quad \text{lb-mol}/379.5 \text{ scf} \times 34 \text{ lb/lb-mol} \times 1,440 \text{ min/day} \\ &= 1.7 \text{ lb-H2S/day} \end{aligned}$$

$$\begin{aligned} \text{Annual H2S Emissions} &= 1,840 \text{ scf-waste gas/min} \times 7.0 \text{ scf-H2S}/10^6 \text{ scf-waste gas} \times \\ &\quad \text{lb-mol}/379.5 \text{ scf} \times 34 \text{ lb/lb-mol} \times 1,440 \text{ min/day} \times \\ &\quad 365 \text{ days/year} \\ &= 607 \text{ lb-H2S/year} \end{aligned}$$

Receiving Pit Open Biofilter

$$\begin{aligned} \text{Daily H2S Emissions} &= 1,440 \text{ scf-waste gas/min} \times 2.0 \text{ scf-H2S}/10^6 \text{ scf-waste gas} \times \\ &\quad \text{lb-mol}/379.5 \text{ scf} \times 34 \text{ lb/lb-mol} \times 1,440 \text{ min/day} \\ &= 0.4 \text{ lb-H2S/day} \end{aligned}$$

$$\begin{aligned} \text{Annual H}_2\text{S Emissions} &= 1,440 \text{ scf-waste gas/min} \times 2.0 \text{ scf-H}_2\text{S}/10^6 \text{ scf-waste gas} \times \\ &\quad \text{lb-mol}/379.5 \text{ scf} \times 34 \text{ lb/lb-mol} \times 1,440 \text{ min/day} \times \\ &\quad 365 \text{ days/year} \\ &= 136 \text{ lb-H}_2\text{S/year} \end{aligned}$$

Daily Flare Emissions

Steady State Daily Post-Project Emissions – Each Flare (Digester Gas Fuel)			
Pollutant	Emission Factors	Heat input	PE2 Total
NO _x	0.03 (lb/MMBtu) x 1.0 (MMscf/day)	x 600 (Btu/scf)	= 18.0 (lb/day)
SO _x	0.0112 (lb/MMBtu) x 1.0 (MMscf/day)	x 600 (Btu/scf)	= 6.7 (lb/day)
PM ₁₀	0.008 (lb/MMBtu) x 1.0 (MMscf/day)	x 600 (Btu/scf)	= 4.8 (lb/day)
CO	0.30 (lb/MMBtu) x 1.0 (MMscf/day)	x 600 (Btu/scf)	= 180.0 (lb/day)
VOC	0.068 (lb/MMBtu) x 1.0 (MMscf/day)	x 600 (Btu/scf)	= 40.8 (lb/day)

The applicant has stated the worst case daily SO_x emissions during each commissioning period will be limited to 140.7 lb/day.

Commissioning Daily Post-Project Emissions – Each Flare (Digester Gas Fuel)			
Pollutant	Emission Factors	Heat input	PE2 Total
NO _x	0.03 (lb/MMBtu) x 1.0 (MMscf/day)	x 600 (Btu/scf)	= 18.0 (lb/day)
SO _x			140.7 (lb/day)
PM ₁₀	0.008 (lb/MMBtu) x 1.0 (MMscf/day)	x 600 (Btu/scf)	= 4.8 (lb/day)
CO	0.30 (lb/MMBtu) x 1.0 (MMscf/day)	x 600 (Btu/scf)	= 180.0 (lb/day)
VOC	0.068 (lb/MMBtu) x 1.0 (MMscf/day)	x 600 (Btu/scf)	= 40.8 (lb/day)

Daily Worst Case Post-Project Emissions – Each Flare (Digester Gas Fuel)	
Pollutant	PE2 Total (lb/day)
NO _x	18.0
SO _x	140.7
PM ₁₀	4.8
CO	180.0
VOC	40.8

Annual Flare Emissions

Steady State Annual Post-Project Emissions – Each Flare (Digester Gas Fuel)							
Pollutant	Emission Factors		Heat input			PE2 Total	
NO _x	0.03	(lb/MMBtu)	x	36.5	(MMscf/year)	x	600 (Btu/scf) = 657 (lb/year)
PM ₁₀	0.008	(lb/MMBtu)	x	36.5	(MMscf/year)	x	600 (Btu/scf) = 175 (lb/year)
CO	0.30	(lb/MMBtu)	x	36.5	(MMscf/year)	x	600 (Btu/scf) = 6,570 (lb/year)
VOC	0.068	(lb/MMBtu)	x	36.5	(MMscf/year)	x	600 (Btu/scf) = 1,489 (lb/year)

As stated above, the worst case daily SO_x emissions during each commissioning period will be limited to 140.7 lb/day. The corresponding digester gas fuel flow rate and annual emissions using the 140.7 lb/day limit will be calculated below (i.e. 140.7 lb/day x MMBtu/1.124 lb x scf/600 Btu = 208,630 scf).

The steady state digester gas fuel flow rate is calculated as the difference between the maximum proposed annual digester gas fuel flow rate of 36.5 MMscf/year and the combined digester gas fuel flow during each commissioning period (36,500,000 scf – 208,630 scf x 30 days – 335,000 scf x 15 days – 834,520 scf x 15 days).

Annual Post-Project SO_x Emissions (Commissioning + Steady State) – Each Flare (Digester Gas Fuel)							
SO _x	1.124	(lb/MMBtu)	x	208,630	(scf/day)	x	30 days/year x 600 (Btu/scf) = 4,221 (lb/year)
	0.70	(lb/MMBtu)	x	335,000	(scf/day)	x	15 days/year x 600 (Btu/scf) = 2,111 (lb/year)
	0.281	(lb/MMBtu)	x	834,520	(scf/day)	x	15 days/year x 600 (Btu/scf) = 2,111 (lb/year)
	0.0112	(lb/MMBtu)	x	12,698,300	(scf/year)	x	600 (Btu/scf) = 85 (lb/year)
	Total			36,500,000	(scf/year)		

Annual Post-Project Emissions (Commissioning + Steady State) – Each Flare (Digester Gas Fuel)							
Pollutant	Emission Factors		Heat input			PE2 Total	
NO _x	0.03	(lb/MMBtu)	x	36.5	(MMscf/year)	x	600 (Btu/scf) = 657 (lb/year)
SO _x							8,528 (lb/year)
PM ₁₀	0.008	(lb/MMBtu)	x	36.5	(MMscf/year)	x	600 (Btu/scf) = 175 (lb/year)
CO	0.30	(lb/MMBtu)	x	36.5	(MMscf/year)	x	600 (Btu/scf) = 6,570 (lb/year)
VOC	0.068	(lb/MMBtu)	x	36.5	(MMscf/year)	x	600 (Btu/scf) = 1,489 (lb/year)

Annual Worst Case Post-Project Emissions – Both Flares (Digester Gas Fuel)	
Pollutant	PE2 Total
NO _x	657 x 2 = 1,314
SO _x	8,528 x 2 = 17,056
PM ₁₀	175 x 2 = 350
CO	6,570 x 2 = 13,140
VOC	1,489 x 2 = 2,978

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Daily Post-Project Emissions – Each Engine (Natural Gas Fuel)					
Pollutant	Emission Factor (g/bhp-hr)	Horsepower Rating (bhp)	Hours of Operation (hr/day)	Conversion (g/lb)	PE2 Total (lb/day)
NO _x	0.108	831	24	453.6	4.7
SO _x	0.0094	831	24	453.6	0.4
PM ₁₀	0.033	831	24	453.6	1.5
CO	0.60	831	24	453.6	26.4
VOC	0.15	831	24	453.6	6.6
NH ₃					0.5

Ammonia

Ammonia (NH₃) emissions will be emitted by the operation of the SCR system. The proposed daily NH₃ emissions can be calculated as follows:

$$PE = ppm \times MW \times (2.64 \times 10^{-9}) \times \text{exhaust flow rate} \times 1440 \text{ min/day}$$

Where:

- ppm is the emission concentration in ppmvd @ 15% O₂
- MW is the molecular weight of the pollutant (MW_{NH3} = 17 lb/lb-mol)
- 2.64 x 10⁻³ is the inverse of the molar specific volume (lb/scf, at 60 °F)
- Exhaust flow rate = 4,281.3 scf/min (per manufacturer)
- engine is operated a maximum of 1,440 min/day and 8,760 hours/year.

$$\begin{aligned} \text{NH}_3 \text{ PE (lb/day)} &= 5 \times 10^{-6} \times 17 \times (2.64 \times 10^{-3}) \text{ (lb-mol/scf)} \times 1,686.85 \text{ (scf/min)} \times \\ &\quad 1,440 \text{ (min/day)} \\ &= \mathbf{0.5 \text{ lb-NH}_3/\text{day}} \end{aligned}$$

Annual Post-Project Emissions – Each Engine (Natural Gas Fuel)					
Pollutant	Emission Factor (g/bhp-hr)	Horsepower Rating (bhp)	Hours of Operation (hr/year)	Conversion (g/lb)	PE2 Total (lb/year)
NO _x	0.108	831	8,760	453.6	1,733
SO _x	0.0094	831	8,760	453.6	151
PM ₁₀	0.033	831	8,760	453.6	530
CO	0.60	831	8,760	453.6	9,629
VOC	0.15	831	8,760	453.6	2,407
NH ₃					199

Ammonia

The proposed annual NH₃ emissions can be calculated as follows:

$$PE = \text{ppm} \times \text{MW} \times (2.64 \times 10^{-9}) \times \text{exhaust flow rate} \times 1440 \text{ min/day} \times 365 \text{ day/year}$$

$$\begin{aligned} \text{NH}_3 \text{ PE (lb/year)} &= 5 \times 10^{-6} \times 17 \times (2.64 \times 10^{-3}) \text{ (lb-mol/scf)} \times 1,686.85 \text{ (scf/min)} \times \\ &\quad 1440 \text{ (min/day)} \times 365 \text{ day/year} \\ &= \mathbf{199 \text{ lb-NH}_3/\text{year}} \end{aligned}$$

GHG Calculations

Basis and Assumptions

- BHP to Btu/hr conversion: 2,542.5 Btu/bhp-hr
- Thermal efficiency of engine: commonly $\approx 35\%$
- Emission factors and global warming potentials (GWP) are taken from EPA 40 CFR Part 98, Subpart A, Tables C-1 and C-2:

Natural Gas

CO ₂	53.02 kg/MMBtu (116.89 lb/MMBtu)
CH ₄	1.0×10^{-3} kg/MMBtu (0.0022 lb/MMBtu)
N ₂ O	1.0×10^{-4} kg/MMBtu (0.00022 lb/MMBtu)

Biogas

CO ₂	52.07 kg/MMBtu (114.79 lb/MMBtu)
CH ₄	3.2×10^{-3} kg/MMBtu (0.00705 lb/MMBtu)
N ₂ O	6.3×10^{-4} kg/MMBtu (0.00139 lb/MMBtu)

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

Calculations

Hourly Emissions (Engines)

$$\begin{aligned} \text{CO}_2 \text{ Emissions} &= (831+831) \text{ bhp}_{\text{out}} \times 2,542.5 \text{ Btu}_{\text{in}}/\text{bhp}_{\text{in}}\text{-hr} \times 116.89 \text{ lb/MMBtu}_{\text{in}} \\ &\quad \times 1 \text{ bhp}_{\text{in}}/0.35 \text{ bhp}_{\text{out}} \\ &= 1,411.24 \text{ lb-CO}_2\text{e/hour} \end{aligned}$$

$$\begin{aligned} \text{CH}_4 \text{ Emissions} &= (831+831) \text{ bhp}_{\text{out}} \times 2,542.5 \text{ Btu}_{\text{in}}/\text{bhp}_{\text{in}}\text{-hr} \times 0.0022 \text{ lb/MMBtu}_{\text{in}} \\ &\quad \times 1 \text{ bhp}_{\text{in}}/0.35 \text{ bhp}_{\text{out}} \times 21 \text{ lb-CO}_2\text{e per lb-CH}_4 \\ &= 0.56 \text{ lb-CO}_2\text{e/hour} \end{aligned}$$

$$\begin{aligned} \text{N}_2\text{O Emissions} &= (831+831) \text{ bhp}_{\text{out}} \times 2,542.5 \text{ Btu}_{\text{in}}/\text{bhp}_{\text{in}}\text{-hr} \times 0.00022 \text{ lb/MMBtu}_{\text{in}} \\ &\quad \times 1 \text{ bhp}_{\text{in}}/0.35 \text{ bhp}_{\text{out}} \times 310 \text{ lb-CO}_2\text{e per lb-N}_2\text{O} \\ &= 0.82 \text{ lb-CO}_2\text{e/hour} \end{aligned}$$

$$\text{Total} = 1,411.24 + 0.56 + 0.82 = 1,412.62 \text{ lb-CO}_2\text{e/hour}$$

Annual Emissions (Engines)

$1,412.62 \text{ lb-CO}_2(\text{eq})/\text{hour} \times 8,760 \text{ hr/year} \div 2,000 \text{ lb/ton} = \mathbf{6,187 \text{ short tons-CO}_2(\text{eq})/\text{year}}$

Hourly Emissions (Flares)

CO₂ Emissions = $(41+41) \text{ MMBtu/hr} \times 114.79 \text{ lb/MMBtu}$
= $9,412.78 \text{ lb-CO}_2(\text{eq})/\text{hour}$

CH₄ Emissions = $(41+41) \text{ MMBtu/hr} \times 0.00705 \text{ lb/MMBtu} \times 21 \text{ lb-CO}_2(\text{eq}) \text{ per lb-CH}_4$
= $12.14 \text{ lb-CO}_2(\text{eq})/\text{hour}$

N₂O Emissions = $(41+41) \text{ MMBtu/hr} \times 0.00139 \text{ lb/MMBtu} \times 310 \text{ lb-CO}_2(\text{eq}) \text{ per lb-N}_2\text{O}$
= $35.33 \text{ lb-CO}_2(\text{eq})/\text{hour}$

Total = $9,412.78 + 12.14 + 35.33 = 9,460.25 \text{ lb-CO}_2(\text{eq})/\text{hour}$

Annual Emissions (External Combustion)

$9,460.25 \text{ lb-CO}_2(\text{eq})/\text{hour} \times 8,760 \text{ hr/year} \div 2,000 \text{ lb/ton} = \mathbf{41,436 \text{ short tons-CO}_2(\text{eq})/\text{year}}$

Total Annual Emissions (Engines + Flares)

$(6,187 + 41,436) \text{ short tons-CO}_2(\text{eq})/\text{year} = \mathbf{47,623 \text{ short tons-CO}_2(\text{eq})/\text{year}}$

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

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

The facility will be treated as new in this project; therefore, the SSPE1 is equal to zero.

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

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

Post-Project Stationary Source Potential to Emit [SSPE2] (lb/year)					
Permit Unit	NO _x	SO _x	PM ₁₀	CO	VOC
S-8153-1-0	788	294	210	7,884	1,787
S-8153-1-1	1,314	17,056	350	13,140	2,978
S-8153-2-0	6,272	1,547	1,380	79,441	6,272
S-8153-3-0	6,272	1,547	1,380	79,441	6,272
S-8153-4-0	1,733	151	530	9,629	199
S-8153-5-0	1,733	151	530	9,629	199
Post-Project SSPE (SSPE2)	4,780	17,358	1,410	32,398	3,376

The facility will install either the digester gas-fired engines (ATCs S-8153-1-0, '2-0, '3-0) or the natural gas-fired engines (ATCs S-8153-1-1, '4-0, '5-0). This project authorizes the installation of the natural gas-fired engines; therefore, the SSPE2 will be calculated using the natural gas-fired engine permits (ATCs S-8153-1-1, '4-0, '5-0).

5. Major Source Determination

Rule 2201 Major Source Determination

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

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

Rule 2201 Major Source Determination (lb/year)					
	NO _x	SO _x	PM ₁₀	CO	VOC
Pre-Project SSPE (SSPE1)	0	0	0	0	0
Post Project SSPE (SSPE2)	4,780	17,358	1,410	32,398	3,376
Major Source Threshold	20,000	140,000	140,000	200,000	20,000
Major Source?	No	No	No	No	No

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)(i). Therefore the following PSD Major Source thresholds are applicable.

PSD Major Source Determination (tons/year)							
	NO2	VOC	SO2	CO	PM	PM10	CO2e
Estimated Facility PE before Project Increase	0	0	0	0	0	0	0
PSD Major Source Thresholds	250	250	250	250	250	250	100,000
PSD Major Source ? (Y/N)	N	N	N	N	N	N	N

6. Baseline Emissions (BE)

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

Pursuant to District Rule 2201, BE = Pre-project Potential to Emit for:

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

otherwise,

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

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

Therefore BE = PE1.

7. SB 288 Major Modification

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

Since this facility is not a major source for any of the pollutants addressed in this project, this project does not constitute an SB 288 major modification.

8. Federal Major Modification

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

Since this facility is not a Major Source for any pollutants, this project does not constitute a Federal Major Modification. Additionally, since the facility is not a major source for PM₁₀ (140,000 lb/year), it is not a major source for PM_{2.5} (200,000 lb/year).

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

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

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

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

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

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

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

I. Potential to Emit for New or Modified Emission Units vs PSD Major Source Thresholds

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

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

PSD Major Source Determination: Potential to Emit (tons/year)							
	NO2	VOC	SO2	CO	PM	PM10	CO2e
Total PE from New and Modified Units	2.4	1.7	8.7	16.2	0.7	0.7	47,623
PSD Major Source Thresholds	250	250	250	250	250	250	100,000
New PSD Major Source ? (Y/N)	N	N	N	N	N	N	N

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

10. Quarterly Net Emissions Change (QNEC)

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

QNEC = PE2 - PE1, where:

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

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Quarterly NEC [QNEC]			
	PE2 (lb/qtr)	PE1 (lb/qtr)	QNEC (lb/qtr)
NO _x	329	0	329
SO _x	4,264	0	4,264
PM ₁₀	88	0	88
CO	3,285	0	3,285
VOC	745	0	745

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Quarterly NEC [QNEC]			
	PE2 (lb/qtr)	PE1 (lb/qtr)	QNEC (lb/qtr)
NO _x	433	0	433
SO _x	38	0	38
PM ₁₀	133	0	133
CO	2,407	0	2,407
VOC	602	0	602

VIII. Compliance

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

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

- a. Any new emissions unit with a potential to emit exceeding two pounds per day,
- b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
- c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
- d. Any new or modified emissions unit, in a stationary source project, which results in a Major Modification.

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

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

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The applicant is proposing to install a new digester system served by two digester gas-fired flares with a PE greater than 2 lb/day for NO_x, SO_x, PM₁₀, CO, and VOC. As the flare has VOC emissions greater than 2 lb/day, it can be reasonably concluded that the digester system uncontrolled VOC emissions are greater than 2 lb/day. BACT is required for emission units with a PE greater than 2 lb/day; therefore, the digester system triggers BACT for VOC. The flare is a control device to the digester system that is combusting the digester gas produced by the digester system such that it is not vented directly to the atmosphere. Therefore, the digester gas-fire flare is considered a control device and will not be considered an emission unit for the purposes of this project.

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As seen in Section VII.C.2 above, the applicant is proposing to install a new natural gas-fired IC engine with a PE greater than 2 lb/day for NO_x, CO, and VOC. BACT is triggered for NO_x and VOC since the PEs are greater than 2 lbs/day. However BACT is not triggered for CO since the SSPE2 for CO is not greater than 200,000 lbs/year, as demonstrated in Section VII.C.5 above.

Natural Gas Fuel – Each Engine		
Pollutant	Daily PE2	BACT Triggered?
NO _x	4.7	Yes
SO _x	0.4	No
PM ₁₀	1.5	No
CO	26.4	No*
VOC	6.6	Yes
NH ₃	0.5	No

* BACT is not triggered for CO since the SSPE2 for CO is not greater than 200,000 lbs/year

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

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

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

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

d. SB 288/Federal Major Modification

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

2. BACT Discussion/Guideline

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There are increases in emissions associated with the flares. The flares are used to control the digester gas that is generated by the digester system and therefore is an emission control device. In accordance with District definitions, an emission control device is not an emission unit. Per District Rule 2201, only emission units can trigger BACT. Therefore, an emission control device cannot be subject to BACT requirements.

District BACT Guideline 1.4.4 applies to digester gas-fired flares. This BACT guideline was established prior to the District formalizing a position of BACT on control equipment. The guideline was simply a place to list the criteria to be a well controlled flare, but as the flare would not trigger BACT, it is inappropriate to have a BACT guideline for a flare. However, upon review of the BACT Guideline 1.4.4, the proposed flares will operate with NO_x emissions of 0.03 lb/MMBtu, operate with dry absorption such that fuel sulfur content ≤ 40 ppmv (as H₂S), smokeless operation

with a 5% opacity limit, and VOC emissions of 0.068 lb/MMBtu which meets the achieved in practice BACT requirements for this type of operation. Therefore, the proposed flares are minimizing the generation of collateral pollutants and is equivalent to the best control alternatives available for this type of operation.

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BACT Guideline 3.3.12, applies to the natural gas-fired IC engines. [Fossil Fuel-Fired I.C. Engine] (See Attachment A)

3. Top-Down BACT Analysis

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

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

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NO_x: 9 ppmvd @ 15% O₂ and 0.15 g/bhp-hr
VOC: 25 ppmvd @ 15% O₂ and 0.15 g/bhp-hr

B. Offsets

1. Offset Applicability

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

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

Offset Determination (lb/year)					
	NO _x	SO _x	PM ₁₀	CO	VOC
Post Project SSPE (SSPE2)	4,780	17,358	1,410	32,398	3,376
Offset Threshold	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	No	No	No	No	No

2. Quantity of Offsets Required

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

C. Public Notification

1. Applicability

Public noticing is required for:

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

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

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

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

b. PE > 100 lb/day

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

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PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO _x	18.0	100 lb/day	No
SO _x	140.7	100 lb/day	Yes
PM ₁₀	4.8	100 lb/day	No
CO	180.0	100 lb/day	Yes
VOC	40.8	100 lb/day	No

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PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO _x	4.7	100 lb/day	No
SO _x	0.4	100 lb/day	No
PM ₁₀	1.5	100 lb/day	No
CO	26.4	100 lb/day	No
VOC	6.6	100 lb/day	No

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

c. Offset Threshold

The following table compares pollutant will trigger public noticing requirements. As seen the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Threshold				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO _x	0	4,780	20,000 lb/year	No
SO _x	0	17,358	54,750 lb/year	No
PM ₁₀	0	1,410	29,200 lb/year	No
CO	0	32,398	200,000 lb/year	No
VOC	0	3,376	20,000 lb/year	No

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

d. SSIPE > 20,000 lb/year

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

Stationary Source Increase in Permitted Emissions [SSIFE] – Public Notice					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIFE (lb/year)	SSIFE Public Notice Threshold	Public Notice Required?
NO _x	4,780	0	4,780	20,000 lb/year	No
SO _x	17,358	0	17,358	20,000 lb/year	No
PM ₁₀	1,410	0	1,410	20,000 lb/year	No
CO	32,398	0	32,398	20,000 lb/year	Yes
VOC	3,376	0	3,376	20,000 lb/year	No

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

2. Public Notice Action

As discussed above, public noticing is required for this project for the flare SO_x and CO emissions in excess of 100 lb/day and for SSIFE greater than 20,000 lb/year for CO. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATCs 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.

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As explained above, the digester gas plant will undergo a commissioning period until the digester gas reaches a certain quality and composition. Therefore, each flare will be operated during the commissioning period.

- The amount of digester gas combusted in each flare shall not exceed any of the following limits: 1.0 MMscf in any one day or 36.5 MMscf in any rolling 12-month period. [District Rule 2201]
- Emissions from each flare shall not exceed any of the following limits: 0.03 lb-NO_x/MMBtu; 0.008 lb-PM₁₀/MMBtu; 0.30 lb-CO/MMBtu; or 0.068 lb-VOC/MMBtu. [District Rule 2201]
- Emissions from each flare, except during the commissioning period, shall not exceed 0.0112 lb-SO_x/MMBtu (based on 40 ppmv sulfur content in fuel (as H₂S) and four hour averaging period). [District Rule 2201]
- Emissions from each flare, including the commissioning period, shall not exceed either of the following limits: 140.7 lb-SO_x/day or 8,528 lb-SO_x/year. [District Rule 2201]

- The amount of digester gas sent through the biofilter serving the air stripper and solids dryer shall not exceed 1,840 scfm. [District Rule 4102]
- The amount of digester gas sent through the biofilter serving the receiving pit shall not exceed 1,440 scfm. [District Rule 4102]
- Emissions from the biofilter serving the air stripper shall not exceed 7 ppmv-H₂S. [District Rule 4102]
- Emissions from the biofilter serving the receiving pit shall not exceed 2 ppmv-H₂S. [District Rule 4102]

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- Emissions from the IC engine when fired on natural gas shall not exceed any of the following limits: 9 ppmv @ 15% O₂ or 0.108 g-NO_x/bhp-hr, 0.0094 g-SO_x/bhp-hr, 0.033 g-PM₁₀/bhp-hr, 82.4 ppmv @ 15% O₂ or 0.60 g-CO/bhp-hr, or 36.1 ppmv @ 15% O₂ or 0.15 g-VOC/bhp-hr. [District Rules 2201 and 4702, and 40 CFR 60 Subpart JJJJ]
- The ammonia (NH₃) emission concentration shall not exceed 5 ppmvd @ 15% O₂. [District Rules 2201 and 4102]

E. Compliance Assurance

1. Source Testing

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

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The following conditions will be placed on the permit to ensure compliance with the assumptions made for Rule 2201. Source testing will be required within 120 days of initial start-up since there will be a commissioning period of up to 60 days.

- Source testing to measure NO_x, CO and VOC emissions from the digester-fired flare shall be conducted within 120 days of initial start-up and at least once every twelve (12) months thereafter. [District Rule 2201]
- For source test purposes, NO_x emissions from the flare shall be determined using EPA Method 19 on a heat input basis, or EPA Method 3A, EPA Method 7E, or ARB Method 100 on a ppmv basis. [District Rule 2201]
- For source test purposes, CO emissions from the flare shall be determined using EPA Method 10 or 10B, ARB Methods 1 through 5 with 10, or ARB Method 100. [District Rule 2201]
- For source test purposes, VOC emissions from the flare shall be determined using EPA Method 25 or 25a. [District Rule 2201]
- Stack gas oxygen (O₂) shall be determined using EPA Method 3A, EPA Method 7E, or ARB Method 100. [District Rule 2201]

- Operator shall determine digester gas fuel higher heating value annually by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rule 2201]

To validate the assumption that the solid fraction produced in the digestate management system does not result in any VOC emissions, an initial source test will be required. The VOC content of the loaded out wet cake and pressed fiber will be determined using EPA Test Methods 413.2 and 418.1 and/or if necessary SCAQMD Test Method 25.3 and/or EPA Test Method 8240.

Based on the maximum throughput of the wet cake and pressed fiber, a calculation will be performed to determine if the VOC emissions exceed two pounds per day. If the VOC emissions exceed two pounds per day, the applicant will be required to submit an Authority to Construct application to assess VOC emissions for the wet cake and pressed fiber loadout operation. The following condition will be placed on the permit to ensure compliance:

- Within 60 days of production of wet cake/pressed fiber, the VOC content of the material shall be determined using EPA Test Methods 413.2 and 418.1 and EPA Test Method 8260, and if necessary EPA Test Method 204 and 204D with either EPA Test Method 25A and 18 or SCAQMD Test Method 25.3, or any other test method approved by the District. If VOC emissions are greater than two pounds per day (based on maximum throughput of the loaded out material), the permittee shall submit an Authority to Construct application for the wet cake/pressed fiber loadout operation within 15 days of the test results. [District Rule 2201]

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

2. Monitoring

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

- During commissioning, the sulfur content of the digester gas combusted in each flare shall be monitored and recorded weekly. [District Rule 2201]
- After commissioning, the sulfur content of the digester gas combusted in this flare shall be monitored and recorded monthly. After eight (8) consecutive monthly tests show compliance, the digester gas sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the digester gas sulfur content limit of this permit, then monthly monitoring shall resume and continue until eight consecutive

- months of monitoring show compliance with the gas sulfur content limit. Once compliance with the gas sulfur content limit is shown for eight consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas 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]
- After commissioning, the H₂S content of the digester gas at the outlet of the biofilter serving the air stripper shall be monitored and recorded monthly. After eight (8) consecutive monthly tests show compliance, the digester gas H₂S content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the digester gas H₂S content limit of this permit, then monthly monitoring shall resume and continue until eight consecutive months of monitoring show compliance with the gas H₂S content limit. Once compliance with the gas H₂S content limit is shown for eight consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the H₂S content of the digester gas shall not be required if the air stripper does not operate during that period. Records of the results of monitoring of the digester gas H₂S content shall be maintained. [District Rule 4102]
 - Monitoring of the digester gas sulfur content shall be performed using a Testo 350 XL portable emission monitor; District-approved in-line H₂S monitors; gas detection tubes calibrated for H₂S; District-approved source test methods, including EPA Method 11 or EPA Method 15, ASTM Method D1072, D4084, and D5504; or an alternative method approved by the District. Prior to utilization of in-line monitors to demonstrate compliance with the digester gas sulfur content limit of this permit, the permittee shall submit details of the proposed monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201]

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

3. Recordkeeping

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

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

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- Permittee shall maintain daily and monthly records of quantity of digester gas combusted in the flare, quantity of digester gas sent to each biofilter, and annual test results of higher heating value of digester gas. [District Rules 1070 and 2201]

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

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

An AAQA shall be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The District's Technical Services Division conducted the required analysis. Refer to Attachment B of this document for the AAQA summary sheet.

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

The proposed location is in a non-attainment area for the state's PM₁₀ as well as federal and state PM_{2.5} thresholds. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for PM₁₀ and PM_{2.5}.

Rule 2410 Prevention of Significant Deterioration

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

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

Rule 2520 Federally Mandated Operating Permits

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)

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

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

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

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

The engines in this project commenced construction and were manufactured in 2012 and are non-emergency lean burn engines with a maximum engine power of 831 HP each. Therefore, this section is applicable and the engines in this project are subject to this subpart.

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

Section 60.4233 lists emission standards for owners and operators. Per Section 60.4233(e), owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine

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

Table 1 of this subpart for non-emergency natural gas-fired engines HP \geq 500 and manufacture date 7/1/2010 for later lists the NO_x standard as 1.0 g/bhp-hr (equivalent to 82 ppmv @ 15% O₂), the CO standard as 2.0 g/bhp-hr (equivalent to 270 ppmv @ 15% O₂), and the VOC standard as 0.7 g/bhp-hr (equivalent to 60 ppmv @ 15% O₂). Emissions from the proposed engines meet the required emissions standards. The following condition will be placed on the permit to ensure compliance:

- Emissions from the IC engine when fired on natural gas shall not exceed any of the following limits: 0.108 g-NO_x/bhp-hr, 0.0094 g-SO_x/bhp-hr, 0.033 g-PM₁₀/bhp-hr, 0.60 g-CO/bhp-hr, or 0.15 g-VOC/bhp-hr. [District Rules 2201 and 4702, and 40 CFR 60 Subpart JJJJ]

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

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

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

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

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

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

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

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

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

- The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type and quantity of fuel used, maintenance or modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]
- Source testing to measure natural gas fuel combustion NO_x, CO, VOC and ammonia emissions from this unit shall be conducted within 60 days of initial start-up. [District Rules 2201 and 4702 and 40 CFR 60 Subpart JJJJ]
- Source testing to measure natural gas fuel combustion NO_x, CO, VOC, and ammonia emissions from this unit shall be conducted once every 8,760 hours of operation or 24 months, whichever comes first. [District Rules 2201 and 4702 and 40 CFR 60 Subpart JJJJ]
- This engine shall be operated and maintained in proper operating condition according to the manufacturer's specifications. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

S-8153-4-0 and '5-0

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

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

- (a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.
- (b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any

combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.

- (c) An area source of HAP emissions is a source that is not a major source.
- (d) If you are an owner or operator of an area source subject to this subpart, your status as an entity subject to a standard or other requirements under this subpart does not subject you to the obligation to obtain a permit under 40 CFR part 70 or 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart as applicable.
- (e) If you are an owner or operator of a stationary RICE used for national security purposes, you may be eligible to request an exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C.

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

Section 63.6590 states this subpart applies to each affected source.

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

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

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

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

- (2) New stationary RICE.
 - (i) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.

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

The proposed engines in this project are new stationary RICE.

(3) Reconstructed stationary RICE.

- (i) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after December 19, 2002.
- (ii) A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.
- (iii) A stationary RICE located at an area source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.

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

(b) Stationary RICE subject to limited requirements.

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

(c) Stationary RICE subject to Regulations under 40 CFR Part 60. An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

- (1) A new or reconstructed stationary RICE located at an area source;
- (2) A new or reconstructed 2SLB stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;
- (3) A new or reconstructed 4SLB stationary RICE with a site rating of less than 250 brake HP located at a major source of HAP emissions;
- (4) A new or reconstructed spark ignition 4 stroke rich burn (4SRB) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;
- (5) A new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis;

- (6) A new or reconstructed emergency or limited use stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;
- (7) A new or reconstructed compression ignition (CI) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions.

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

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

Rule 4101 Visible Emissions

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

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

S-8153-1-1

- 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 ¼ or 5% opacity. [District Rules 2201 and 4101]

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

Rule 4102 Nuisance

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

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

California Health & Safety Code 41700 (Health Risk Assessment)

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

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (Attachment B), the total facility prioritization score including this project was greater than one. Therefore, an HRA was required to determine the short-term acute and long-term chronic exposure from this project.

The cancer risk for this project is shown below:

HRA Summary		
Unit	Cancer Risk	T-BACT Required
S-8153-1-1	0.07 per million	No
S-8153-4-0	3.71 per million	Yes
S-8153-5-0	3.71 per million	Yes

Discussion of T-BACT

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

For this project T-BACT is triggered for VOC. T-BACT is satisfied with BACT for VOC (see Attachment A), which is a VOC emission limit of 0.15 g/bhp-hr; therefore, compliance with the District’s Risk Management Policy is expected.

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

S-8153-4-0 and '5-0

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

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

Rule 4201 Particulate Matter Concentration

Section 3.0 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot.

S-8153-1-1

Particulate matter calculations were performed for each piece of equipment by the following equation:

F-Factor for digester gas:	9,100 dscf/MMBtu
PM ₁₀ Emission Factor:	0.008 lb-PM ₁₀ /MMBtu
Percentage of PM as PM ₁₀ in Exhaust:	100%

$$GL = \left(\frac{0.008 \text{ lb-PM}}{\text{MMBtu}} \times \frac{7,000 \text{ grain}}{\text{lb-PM}} \right) / \left(\frac{9,100 \text{ ft}^3}{\text{MMBtu}} \right)$$

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

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

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$$0.033 \frac{\text{g-PM}_{10}}{\text{bhp-hr}} \times \frac{1 \text{ bhp-hr}}{2,5425 \text{ Btu}} \times \frac{10^6 \text{ Btu}}{8,578 \text{ dscf}} \times \frac{0.35 \text{ Btu}_{out}}{1 \text{ Btu}_{in}} \times \frac{15.43 \text{ grain}}{\text{g}} = 0.008 \frac{\text{grain-PM}}{\text{dscf}}$$

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

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

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

Rule 4301 Fuel Burning Equipment

This rule specifies maximum emission rates in lb/hr for SO₂, NO₂, and combustion contaminants (defined as total PM in Rule 1020). This rule also limits combustion contaminants to ≤ 0.1 gr/scf. According to AP 42 (Table 1.4-2, footnote c), all PM emissions from natural gas combustion are less than 1 μm in diameter. As shown below, each unit's maximum hourly emission rates are below the Rule 4301 limits.

District Rule 4301 Limits			
Unit	NO₂	Total PM	SO₂
S-8153-1-1 (Digester Gas)	0.75	0.20	5.86
S-8153-4-0 or '5-0 (Natural Gas)	0.20	0.06	0.017
Rule 4301 Limit	140 lb/hr	10 lb/hr	200 lb/hr

As shown above, compliance with this rule is expected.

Rule 4311 Flares

Rule 4311 limits the emissions of volatile organic compounds (VOCs) and oxides of nitrogen (NOx), and sulfur oxides (SOx) from the operation of flares.

Pursuant to Section 4.3, except for the record keeping requirement of Section 6.1.4 the requirements of this rule do not apply to any flare located at a stationary source with potential emissions less than 10.0 tons per year of VOC and 10.0 tons per year of NOx.

Section 6.1.4 requires an operator claiming exemption under Section 4.3 to record annual throughput, material usage, or other information necessary to demonstrate compliance with the terms of the exemption. The following condition will ensure compliance with this recordkeeping requirement:

- The facility shall maintain records of annual throughput, material usage, or other information necessary to demonstrate that facility-wide emissions are less than ten tons per year for both NOx and VOC. [District Rule 4311]

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

Rule 4565 Biosolids, Animal Manure, and Poultry Litter Operations

The purpose of this rule is to limit the emissions volatile organic compounds (VOC) from operations involving the management of biosolids, animal manure, or poultry litter.

This rule applies to all facilities whose throughput consists entirely or in part of biosolids, animal manure, or poultry litter and the operator who landfills, land applies, composts, or co-composts these materials.

Compost is defined in Section 3.14 as the controlled biological decomposition of organic material, such as sewage sludge, animal manures, or crop residues, under aerobic (with air) or anaerobic (without air) conditions to form a humus-like material. This facility does not incorporate controlled biological decomposition of organic material. Therefore, this facility does not perform composting.

Co-compost is defined in Section 3.12 as composting where biosolids and/or animal manure and/or poultry litter are mixed with other materials, including amendments, to produce compost. Co-composting includes both the active and curing phases of the

composting process. This facility does not mix biosolids and/or animal manure and/or poultry litter with other materials, including amendments, to produce compost.

This facility does not landfill, land apply, compost, or co-compost biosolids, animal manure, or poultry litter. Therefore, the requirements of this rule are not applicable to this project.

Rule 4566 Organic Material Composting Operations

The purpose of this rule is to limit emissions of volatile organic compounds (VOC) from composting operations.

The provisions of this rule apply to composting facilities that compost and/or stockpile organic material.

Section 3.13 defines composting as a process in which solid organic waste materials are decomposed in the presence of oxygen through the action of bacteria and other microorganisms.

This facility does not perform composting as a process in which solid organic waste materials are decomposed in the presence of oxygen through the action of bacteria and other microorganisms. Therefore, this facility is not subject to the requirements of this rule.

Rule 4701 Stationary Internal Combustion Engines – Phase I

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

Rule 4702 Internal Combustion Engines – Phase 2

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

Section 2.0 states that this rule applies to any internal combustion engine rated at 25 brake horsepower or greater. Each of the proposed engines for the cogeneration system is rated at 831 bhp. Therefore, this rule is applicable to each engine.

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

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

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

The facility has proposed to achieve the following emissions:

Natural Gas Fuel

- NO_x: 9 ppmvd @ 15 % O₂;
- CO: 82.4 ppmvd @ 15 % O₂; and
- VOC: 36.1 ppmvd @ 15 % O₂

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

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

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

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

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

- 5.7.1 Operate the engine exclusively on PUC-quality natural gas, commercial propane, butane, or liquefied petroleum gas, or a combination of such gases; or
- 5.7.2 Limit gaseous fuel sulfur content to no more than five (5) grains of total sulfur per one hundred (100) standard cubic feet; or

- 5.7.3 Use California Reformulated Gasoline for gasoline-fired spark-ignited engines; or
- 5.7.4 Use California Reformulated Diesel for compression-ignited engines; or
- 5.7.5 Operate the engine on liquid fuel that contains no more than 15 ppm sulfur, as determined by the test method specified in Section 6.4.6; or
- 5.7.6 Install and properly operate an emission control system that reduces SO₂ emissions by at least 95% by weight as determined by the test method specified in Section 6.4.6.

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

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

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

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

The applicant has chosen to meet the requirements of Section 5.8.1 of the rule by proposing a pre-approved alternate emissions monitoring plan that specifies that the permittee perform periodic NO_x, CO, and O₂ emissions concentrations as specified in District Policy SSP-1810, dated 4/29/04. Therefore, the following conditions will be listed on the permit to ensure compliance:

- The permittee shall monitor and record the stack concentration of NO_x, CO, O₂, and NH₃ at least once every month (in which a source test is not performed). NO_x, CO, and O₂ concentrations shall be performed using a portable emission monitor that meets District specifications. NH₃ monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to

perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

- If the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, or the NH₃ concentrations corrected to 15% O₂, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]
- {2994} All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]

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

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

- This engine shall be equipped with a nonresettable elapsed operating time meter and a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved alternative. [District Rules 2201 and 4702 and 40 CFR 60 Subpart JJJJ]

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

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

Section 5.8.8 requires that for each engine, collect data through the I&M plan in a form approved by the APCO. The applicant has submitted an I&M plan and the implementation of this plan will be explained below in the discussion of Section 6.5 of this rule.

Section 5.8.9 requires that for each engine, the operator shall use a portable NO_x analyzer to take NO_x emission readings to verify compliance with the emission requirements of Section 5.2 or Section 8.0 during each calendar quarter in which a source test is not performed. All emission readings shall be taken with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. All NO_x emissions readings shall be reported to the APCO in a manner approved by the APCO. NO_x emission readings taken pursuant to this section shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive minute sample reading or by taking at least five (5) readings evenly spaced out over the 15 consecutive-minute period.

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

- The permittee shall monitor and record the stack concentration of NO_x, CO, O₂, and NH₃ at least once every month (in which a source test is not performed). NO_x, CO, and O₂ concentrations shall be performed using a portable emission monitor that meets District specifications. NH₃ monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
- {2994} All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]

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

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

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

This unit is fired on PUC-Regulated natural gas. Therefore, the following requirement will be included on the permit to comply with the SO_x emissions monitoring requirement:

- The permittee shall submit an analysis showing the natural gas fuel sulfur content at least once every year. Valid purchase contracts, supplier certifications, tariff sheets, or transportation contacts may be used to satisfy this requirement, provided they establish the fuel parameters mentioned above. [District Rules 2201 and 4702]

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

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

This submitted ATC application satisfies the requirements of this section.

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

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

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

- The permittee shall maintain records of: (1) the date and time of NO_x, CO, O₂, and NH₃ measurements, (2) the O₂ concentration in percent and the measured NO_x, CO, and NH₃ concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]
- The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type and quantity of fuel used, maintenance or modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]

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

- All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- The permittee shall monitor and record the stack concentration of NO_x, CO, O₂, and NH₃ at least once every month (in which a source test is not performed). NO_x, CO, and O₂ concentrations shall be performed using a portable emission monitor that meets District specifications. NH₃ monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to

perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

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

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

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

- If the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, or the NH₃ concentrations corrected to 15% O₂, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]

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

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

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

- {3787} All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]

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

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

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

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

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

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

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

Table 5 Compliance Schedule for Non-AO Spark-Ignited Engines Subject to Table 2 Emission Limits, and SOx Control and Monitoring Requirements			
Engines to be in Compliance at a Stationary Source	Emission Control Plan	Authority to Construct and Inspection and Monitoring Plan	Full Compliance
Operator with at least two engines, but less than 12 engines at a stationary source			
33% or more of the engines subject to Table 2 emission limits as of August 18, 2011	7/1/12	1/1/13	1/1/14
66% or more of the engines subject to Table 2 emission limits as of August 18, 2011	7/1/12	1/1/14	1/1/15
100% of the engines subject to Table 2 emission limits	7/1/12	1/1/15	1/1/16

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

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

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

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

Rule 4801 Sulfur Compounds

Rule 4801 requires that sulfur compound emissions (as SO₂) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

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

n = moles SO₂
T (standard temperature) = 60 °F or 520 °R
R (universal gas constant) = $\frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot ^\circ\text{R}}$

S-8153-1-1

F-Factor for Digester gas: 9,100 dscf/MMBtu

$$\frac{1.124 \text{ lb} - \text{SOx}}{\text{MMBtu}} \times \frac{\text{MMBtu}}{9,100 \text{ dscf}} \times \frac{1 \text{ lb} \cdot \text{mol}}{64 \text{ lb}} \times \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot ^\circ\text{R}} \times \frac{520^\circ\text{R}}{14.7 \text{ psi}} \times \frac{1,000,000 \cdot \text{parts}}{\text{million}} = 733 \frac{\text{parts}}{\text{million}}$$

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

S-8153-4-0 and '5-0

Natural Gas Fuel

$$2.85 \frac{\text{lb} - \text{S}}{\text{MMscf} - \text{gas}} \times \frac{1 \text{ scf} - \text{gas}}{1,000 \text{ Btu}} \times \frac{1 \text{ MMBtu}}{8,578 \text{ scf}} \times \frac{1 \text{ lb} - \text{mol}}{64 \text{ lb} - \text{S}} \times \frac{10.73 \text{ psi} - \text{ft}^3}{\text{lb} - \text{mol} - ^\circ\text{R}} \times \frac{520^\circ\text{R}}{14.7 \text{ psi}} \times 1,000,000 = 1.97 \text{ ppmv}$$

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

California Health & Safety Code 42301.6 (School Notice)

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

California Environmental Quality Act (CEQA)

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

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.

- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

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

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

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

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Pending a successful NSR Public Noticing period, issue Authorities to Construct S-8153-1-1, '4-0, '5-0 subject to the permit conditions on the attached draft Authorities to Construct in Attachment C.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
S-8153-1-1	3020-02-H	82 MMBtu/hr flares	\$1030.00
S-8153-4-0	3020-10-E	831 bhp IC engine	\$602.00
S-8153-5-0	3020-10-E	831 bhp IC engine	\$602.00

Attachments

- A: BACT Guideline 3.3.12 and Top Down BACT Analysis
- B: Health Risk Assessment and Ambient Air Quality Analysis
- C: Draft ATCs

Attachment A

BACT Guideline 3.3.12 and Top Down BACT Analysis

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 3.3.12*

Last Update 10/1/2002

Fossil Fuel Fired IC Engine > 50 hp**

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
CO	56 ppmvd @ 15% O ₂ , 0.6 g/bhp-hr, or 1.9 lb/MW-hr		
NO _x	9 ppmvd @ 15% O ₂ , 0.15 g/bhp-hr, or 0.5 lb/MW-hr	5 ppmv @ 15% O ₂ (Selective Catalytic Reduction, or equal)	2 ppmv natural gas fired turbine
PM ₁₀	0.02 g/bhp-hr, or 0.06 lb/MW-hr		
SO _x	PUC quality natural gas, or equal.		
VOC	25 ppmvd @15% O ₂ , 0.15 g/bhp-hr, or 0.5 lb/MW-hr		

** For the purposes of this determination, fossil fuels includes diesel, gasoline, natural gas, propane, kerosene, and similar hydrocarbon compounds derived from petroleum oil or natural gas. Fossil fuels also include similar synthetic fuels such as biodiesel and/or any fuel containing one or more fossil fuels.

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**

1. NO_x Top-Down BACT Analysis for Permit Unit S-8153-4-0 and '5-0

Step 1 – Identify all control technologies

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

- 1) NO_x emissions 9 ppmvd @ 15% O₂, 0.15 g/bhp-hr, or 0.5 lb/MW-hr (Achieved in Practice)
- 2) NO_x emissions 5 ppmvd @ 15% O₂ (Selective Catalytic Reduction, or equal) (Technologically Feasible)
- 3) Turbine (2 ppmv, natural gas fuel) (Alternate Basic Equipment)

Step 2 - Eliminate Technologically Infeasible Options

None of the above listed technologies are technologically infeasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Rank	Control Technology	Achieved in Practice
1	Turbine (2 ppmv, natural gas fuel)	N
2	NO _x emissions 5 ppmvd @ 15% O ₂ (Selective Catalytic Reduction, or equal)	N
3	NO _x emissions 9 ppmvd @ 15% O ₂ , 0.15 g/bhp-hr, or 0.5 lb/MW-hr	Y

There are no remaining control technologies for NO_x.

Step 4 - Cost Effectiveness Analysis

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

The proposed engines are lean burn, natural gas-fired, engine is subject to the District Rule 4702 emission limits for non-agricultural, lean burn, natural gas-fired IC engines. Therefore, in accordance with the District's Revised BACT Cost Effectiveness Thresholds Memo, the District Standard Emissions used for the BACT cost analysis below for the proposed engine will be based on the emission limits for non-agricultural, lean burn, natural

gas-fired IC engines contained in District Rule 4702, Section 5.1.1, Table 2, 2.d (11 ppmvd NO_x, 2,000 ppmvd CO, and 750 ppmvd VOC (all measured @ 15% O₂)).

Option 1: Turbine (2 ppmv, natural gas fuel) (Alternate Basic Equipment)

The following cost analysis demonstrates that replacement of the proposed engine with a turbine is not cost effective when considering the capital costs.

Assumptions

Assumptions for Proposed Natural Gas-Fired IC Engines

- Hours of Operation for the Engine = 8,760 (worst case)
- Natural gas F-Factor: 8,578 dscf/MMBtu (60 °F)
- Molar Specific Volume = 379.5 scf/lb-mol (60 °F)
- BHP to Btu/hr conversion: 2,542.5 Btu/hp-hr
- Btu to kW-hr conversion: 3,413 Btu/kW-hr
- Typical mechanical efficiency for engine: 35%
- Rule 4702 NO_x emission limit for non-agricultural, lean burn, natural gas-fired IC engines: 11 ppmv @ 15% O₂ (0.132 g/bhp-hr)

Capital Cost

Per 2G Cenergy, the MWM engine supplier (vendor), the estimated increased incremental capital cost for installation of a similar sized turbine with SCR as a replacement of one of the proposed 831 bhp IC engines is calculated as follows as the difference in cost of a turbine and the IC engine.

Capital Cost Turbine with SCR = \$3,045,000

Capital Cost Proposed Engine with SCR = \$1,480,119

Incremental Capital Cost = \$3,045,000 - \$1,480,119 = \$1,564,881

Annualized Capital Cost

Pursuant to District Policy APR 1305, section X (11/09/99), the incremental capital cost for the purchase of the equipment will be spread over the expected life of the system using the capital recovery equation. The expected life of the equipment 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)

$$\begin{aligned} A &= \$1,564,881 \times [0.1(1.1)^{10}]/[(1.1)^{10}-1] \\ &= \mathbf{\$254,677/year} \end{aligned}$$

Emission Reductions

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

District Standard Emissions = 0.132 g-NO_x/bhp-hr (11 ppmv @ 15% O₂ and 35% engine efficiency)

Emissions from Turbine as Alternative Equipment = 0.024 g-NO_x/bhp-hr (2 ppmv @ 15% O₂ and 35% engine efficiency)

$$\begin{aligned} \text{NO}_x \text{ Emission Reductions} &= 831 \text{ bhp} \times 8,760 \text{ hours/year} \times (0.132 \text{ g-NO}_x/\text{bhp-hr} - 0.024 \\ &\quad \text{g-NO}_x/\text{bhp-hr}) \times \text{lb}/453.6 \text{ g} \\ &= 1,733 \text{ lb-NO}_x/\text{year} \text{ (0.87 ton/year)} \end{aligned}$$

Cost Effectiveness

Cost Effectiveness = Annualized Cost ÷ Annual Emission Reductions

$$\text{Cost Effectiveness} = \mathbf{\$254,677 \div 0.87 \text{ tons-NO}_x = \mathbf{\$293,876/\text{ton-NO}_x}}$$

As shown above, the cost of NO_x reduction by installation of a turbine would be greater than the \$24,500/ton cost effectiveness threshold for NO_x in the District BACT policy, based only on the incremental capital cost of the turbine. Therefore this option is not cost-effective and is being removed from consideration.

Option 2: NO_x emissions 5 ppmvd @ 15% O₂ (Selective Catalytic Reduction, or equal) (Technologically Feasible)

Assumptions

- Hours of Operation for the Engine = 8,760 (worst case)
- Natural gas F-Factor: 8,578 dscf/MMBtu (60 °F)
- Molar Specific Volume = 379.5 scf/lb-mol (60 °F)
- BHP to Btu/hr conversion: 2,542.5 Btu/hp-hr
- Btu to kW-hr conversion: 3,413 Btu/kW-hr
- Typical mechanical efficiency for engine: 35%
- Rule 4702 NO_x emission limit for non-agricultural, lean burn, natural gas-fired IC engines: 11 ppmv @ 15% O₂ (0.132 g/bhp-hr)

Capital Cost

The estimated increased incremental capital cost for operating the proposed engines with SCR achieving 5 ppmv NO_x @ 15% O₂ versus 9 ppmv NO_x @ 15% O₂ is calculated based on the difference in cost operating the engine with SCR achieving 5 ppmv NO_x @ 15% O₂ and 9 ppmv NO_x @ 15% O₂. The incremental capital cost for operating the engine with SCR achieving 5 ppmv NO_x @ 15% O₂ is calculated as follows:

Incremental Capital Cost = \$413,816

Annualized Capital Cost

Pursuant to District Policy APR 1305, section X (11/09/99), the incremental capital cost for the equipment will be spread over the expected life of the system using the capital recovery equation. The expected life of the equipment 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)

$$A = \$413,816 \times [0.1(1.1)^{10}] / [(1.1)^{10} - 1]$$
$$= \mathbf{\$67,347/year}$$

Emission Reductions

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

District Standard Emissions = 0.132 g-NO_x/bhp-hr
(11 ppmv @ 15% O₂ and 35% engine efficiency)

Emissions from Engine as Technologically Feasible Option = 0.060 g-NO_x/bhp-hr
(5 ppmv @ 15% O₂ and 35% engine efficiency)

$$\text{NO}_x \text{ Emission Reductions} = 831 \text{ bhp} \times 8,760 \text{ hours/year} \times (0.132 \text{ g-NO}_x/\text{bhp-hr} - 0.060 \text{ g-NO}_x/\text{bhp-hr}) \times \text{lb}/453.6 \text{ g}$$
$$= 1,155 \text{ lb-NO}_x/\text{year} \text{ (0.58 ton/year)}$$

Cost Effectiveness

Cost Effectiveness = Annualized Cost ÷ Annual Emission Reductions

Cost Effectiveness = \$67,347 ÷ 0.58 tons-NO_x = \$116,116/ton-NO_x

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

Option 3: NO_x emissions 9 ppmvd @ 15% O₂, 0.15 g/bhp-hr, or 0.5 lb/MW-hr (Achieved in Practice)

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

Step 5 - Select BACT

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

NO_x: NO_x emissions 9 ppmvd @ 15% O₂ and 0.15 g/bhp-hr (Achieved in Practice)

The applicant has proposed to apply an SCR system to a lean burn IC engine to reduce NO_x emissions to 9 ppmvd @ 15% O₂ and 0.108 g/bhp-hr. Therefore, the BACT requirements are satisfied.

2. VOC Top-Down BACT Analysis for Permit Unit S-8153-4-0 and '5-0

Step 1 – Identify all control technologies

The following control technology has been identified for fossil fuel-fired IC engines.

- 1) VOC emissions 25 ppmvd @ 15% O₂, 0.15 g/bhp-hr, or 0.5 lb/MW-hr (Achieved in Practice)

Step 2 - Eliminate Technologically Infeasible Options

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

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Rank	Control Technology	Achieved in Practice
1	VOC emissions 25 ppmvd @ 15% O ₂ , 0.15 g/bhp-hr, or 0.5 lb/MW-hr	Y

There are no remaining control technologies for VOC.

Step 4 - Cost Effectiveness Analysis

Option 1: VOC Emissions 25 ppmvd @ 15% O₂, 0.15 g/bhp-hr, or 0.5 lb/MW-hr (Achieved in Practice)

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

Step 5 - Select BACT

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

VOC: VOC emissions 25 ppmvd @ 15% O₂, 0.15 g/bhp-hr, or 0.5 lb/MW-hr (Achieved in Practice)

The applicant has proposed a VOC emission limit of 0.15 g/bhp-hr. Therefore, the BACT requirements are satisfied.

Attachment B

Health Risk Assessment and Ambient Air Quality Analysis

San Joaquin Valley Air Pollution Control District Risk Management Review

To: Stanley Tom – Permit Services
 From: Yu Vu – Technical Services
 Date: April 17, 2013
 Facility Name: Colony Energy
 Location: Paige Ave., West of Enterprise St., Tulare, CA
 Application #(s): S-8153-1-1, 4-0, and 5-0
 Project #: S-1130032

A. RMR SUMMARY

RMR Summary					
Categories	Two 41 MMBtu/hr Biogas Flares (Unit 1-1)	831 BHP NG- Fired ICE (Unit 4-0)	831 BHP NG- Fired ICE (Unit 5-0)	Project Totals	Facility Totals
Prioritization Score	0.20	0.65	0.65	1.49	1.49
Acute Hazard Index	0.66	0.10	0.10	0.87	0.87
Chronic Hazard Index	0.03	0.08	0.08	0.20	0.20
Maximum Individual Cancer Risk (10 ⁻⁶)	0.07 ¹	3.71 ¹	3.71 ¹	7.49	7.49
T-BACT Required?	No	Yes	Yes		
Special Permit Conditions?	No	No	No		

¹ A worker adjustment factor was applied to these scores.

Proposed Permit Conditions

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

Unit # 1-1

1. The H₂S concentration for the flares in this unit may not exceed 40 ppmv. [District Rule 2201]
2. The H₂S emissions from the Gas Conditioning Stripper Column & Solids Heating System (enclosed biofilter) may not exceed 0.068 lb/hr and 598.65 lb/year. [District Rule 2201]
3. The exhaust stack for the Gas Conditioning Stripper Column & Solids Heating System (enclosed biofilter) 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].
4. The H₂S emissions from the Receiving Pits (open biofilter) may not exceed 0.015 lb/hr and 133.86 lb/year. [District Rule 2201]

Unit # 4-0 and 5-0

1. The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
2. This unit may only operate on PUC quality natural gas. [District Rule 2201]
3. Upon implementation of these ATCs, the ATCs/Permits for units S-8153-2-0 and S-8153-3-0 shall be deleted.

T-BACT is required for this unit because of emissions of PAHs which are VOCs. In accordance with District policy, BACT for this unit will be considered to be T-BACT.

B. RMR REPORT

I. Project Description

Technical Services received a request on February 5, 2013, to perform an Ambient Air Quality Analysis and a Risk Management Review for a biogas upgrading system. The project includes a biogas upgrading system consisting with two (2) biofilters, two (2) 41 MMBtu/hr enclosed flares operating on digester gas fuel, and two (2) natural gas-fired IC engines. The two (2) natural gas-fired IC engines are going to replace the engines in units S-8153-2-0 and S-8153-3-0. The applicant has also agreed to a 40 ppmv H₂S limit for all flare activities. Per the engineer, H₂S emissions from the project are only emitted from the two (2) biofilters.

II. Analysis

Technical Services performed a prioritization using the District's HEARTs database. Since the total facility prioritization score was greater than one, a refined health risk assessment was required. Toxic emissions for unit S-8153-1-1 were estimated using the District's "Sewage Gas External Combustion Flare Default" spreadsheet (for the flares) and applicant provided emissions (for the biofilters). Toxic emissions for units S-8153-4-0 and S-8153-5-0 were calculated using Ventura County APCD emission factors for natural gas-fired internal combustion (4 Stroke Lean Burn) engines and the Districts approved conversion factors from Natural Gas to LPG. All toxic emissions associated with the project were input into the HEARTs database. The AERMOD model was used, with the parameters outlined below and meteorological data for 2006-2009 from Visalia to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the Hot Spots Analysis and Reporting Program (HARP) risk assessment module to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

Analysis Parameters Unit 1-1 (Each of two flares)			
Source Type	Point	Location Type	Rural
Stack Height (m)	7.355	Closest Receptor (m)	~175
Stack Diameter. (m)	0.899	Type of Receptor	Business
Stack Exit Velocity (m/s)	82.735	Max Hours per Year	8760
Stack Exit Temp. (°K)	1477.594	Fuel Type	Digester Gas
Burner Rating (MMBtu/hr)	41		

Analysis Parameters Unit 1-1 (Biofilter 1)			
Source Type	Point	Location Type	Rural
Stack Height (m)	7.62	Closest Receptor (m)	~100
Stack Diameter. (m)	0.305	Type of Receptor	Business
Stack Exit Velocity (m/s)	11.901	Max Hours per Year	8760
Stack Exit Temp. (°K)	Ambient	Fuel Type	Digester Gas
Burner Rating (MMBtu/hr)	N/A		

Analysis Parameters Unit 1-1 (Biofilter 2)			
Source Type	Area	Location Type	Rural
X-Length (m)	6.10	Closest Receptor (m)	~95
Y-Length (m)	6.10	Type of Receptor	Business
Release Height (m)	2.438	Pollutant Type	H ₂ S
		Emission Rate (g/m-sec ²)	0.0267

Analysis Parameters Unit 4-0 and 5-0 (Each IC engine)			
Source Type	Point	Location Type	Rural
Stack Height (m)	10.058	Closest Receptor (m)	~180
Stack Diameter. (m)	0.305	Type of Receptor	Business
Stack Exit Velocity (m/s)	10.717	Max Hours per Year	8760
Stack Exit Temp. (°K)	763.15	Fuel Type	Natural Gas
Engine Rating (bhp)	831		

Technical Services performed modeling for criteria pollutants CO, NO_x, SO_x, PM₁₀ and PM_{2.5}. Modeling was also performed for H₂S emissions. The emission rates used for criteria pollutant and H₂S modeling are seen in the following table:

Unit	Emissions (lb/day)					
	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	H ₂ S ¹
Flare 1	18	180	140.7	4.8	4.8	N/A
Flare 2	18	180	140.7	4.8	4.8	N/A
Biofilter 1	N/A	N/A	N/A	N/A	N/A	0.068
Biofilter 2	N/A	N/A	N/A	N/A	N/A	0.015
NG ICE 4	4.7	26.4	0.4	1.5	1.5	N/A
NG ICE 5	4.7	26.4	0.4	1.5	1.5	N/A
	Emissions (lb/yr)					
Flare 1	657	6570	8528	175	175	N/A
Flare 2	657	6570	8528	175	175	N/A
Biofilter 1	N/A	N/A	N/A	N/A	N/A	N/A
Biofilter 2	N/A	N/A	N/A	N/A	N/A	N/A
NG ICE 4	1733	9629	151	530	530	N/A
NG ICE 5	1733	9629	151	530	530	N/A

¹ H₂S emissions are reported in lb/hr since they were only evaluated against a 1-hour standard.

The results from the Criteria Pollutant Modeling are as follows:

Criteria Pollutant Modeling Results*

Diesel ICE	1 Hour	3 Hours	8 Hours.	24 Hours	Annual
CO	Pass	X	Pass	X	X
NO _x	Pass ¹	X	X	X	Pass
SO _x	Pass	Pass	X	Pass	Pass
PM ₁₀	X	X	X	Pass ²	Pass ²
PM _{2.5}	X	X	X	Pass ²	Pass ²
H ₂ S	Pass ³	X	X	X	X

*Results were taken from the attached PSD spreadsheet.

¹The project was compared to the 1-hour NO₂ National Ambient Air Quality Standard that became effective on April 12, 2010 using the District's approved procedures.

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

³The project was compared to the 1-hour H₂S Ambient Air Quality Standard (42 µg/m³).

III. Conclusion

The acute and chronic indices are below 1.0 and the cancer risk associated with the project is greater than 1.0 in a million, but less than 10 in a million. **In accordance with the District's Risk Management Policy, the project is approved with Toxic Best Available Control Technology (T-BACT).**

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

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

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

IV. Attachments

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

Attachment C

Draft ATCs

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
DRAFT

PERMIT NO: S-8153-1-1

LEGAL OWNER OR OPERATOR: COLONY ENERGY PARTNERS-TULARE, LLC
MAILING ADDRESS: 4940 CAMPUS DRIVE, SUITE C
NEWPORT BEACH, CA 92660

LOCATION: PAIGE AVE (WEST OF ENTERPRISE STREET)
TULARE, CA

EQUIPMENT DESCRIPTION:

DIGESTER GAS PRODUCTION OPERATION CONSISTING OF ONE MANURE RECEPTION TANK, ONE DILUTION TANK, ONE FAT, OIL, GREASE, VEGETABLE WASTE RECEPTION TANK, ONE MIXING (FEED) TANK, TWO ANAEROBIC DIGESTER TANKS, ONE DIGESTATE (BUFFER) HOLDING TANK, DIGESTER GAS TREATMENT SYSTEM CONSISTING OF A CHILLER, COMPRESSOR, IRON SPONGE SCRUBBER, AND TWO 41 MMBTU/HR BEKAERT MODEL CEB 1200 DIGESTER GAS-FIRED AIR-ASSIST GROUND LEVEL ENCLOSED FLARES AND DIGESTATE MANAGEMENT SYSTEM CONSISTING OF ONE FILTER SCREW PRESS WITH ONE OVERFLOW BUFFER TANK, ONE SCREW PRESS BUFFER TANK, A POLYMER MAKE-DOWN SYSTEM, A DISSOLVED AIR FLOATATION (DAF) SYSTEM, ONE DIGESTATE BY-PRODUCT LOADOUT STATION, AND ONE BIOSOLIDS HEATING TANK AND TWO BIOMETHANE UPGRADING SYSTEMS EACH CONSISTING OF GAS COMPRESSORS, WATER SCRUBBING VESSEL, FLASH VESSEL, DRIER/PURIFIER VESSEL, AIR STRIPPING VESSEL SERVED BY A BIOFILTER, AND RECEIVING PIT SERVED BY A SECOND BIOFILTER

CONDITIONS

1. Upon implementation of the modification and startup of the equipment authorized by this Authority to Construct (ATC), ATC S-8153-1-0 shall be cancelled. [District Rule 2201]
2. {1407} 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]
3. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
4. 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 1/4 or 5% opacity. [District Rules 2201 and 4101]
5. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

CONDITIONS CONTINUE ON NEXT PAGE

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

Seyed Sadredin, Executive Director, APCO

DAVID WARNER, Director of Permit Services

S-8153-1-1: Jul 16 2013 7:41AM - TOMS : Joint Inspection NOT Required

6. Only digester gas shall be combusted in the flares. [District Rule 2201]
7. The amount of digester gas combusted in each flare shall not exceed any of the following limits: 1.0 MMscf in any one day or 36.5 MMscf in any 12-month rolling period. [District Rule 2201]
8. The flare shall be equipped with an operational, non-resettable, totalizing mass or volumetric fuel flow meter or other District-approved alternative method to measure the amount of gas combusted in the flare. [District Rule 2201]
9. Emissions from each flare shall not exceed any of the following limits: 0.03 lb-NO_x/MMBtu; 0.008 lb-PM₁₀/MMBtu; 0.30 lb-CO/MMBtu; or 0.068 lb-VOC/MMBtu. [District Rule 2201]
10. Emissions from each flare, except during the commissioning period, shall not exceed 0.0112 lb-SO_x/MMBtu (based on 40 ppmv sulfur content in fuel (as H₂S) and four hour averaging period). [District Rule 2201]
11. Emissions from each flare, including the commissioning period, shall not exceed either of the following limits: 140.7 lb-SO_x/day or 8,528 lb-SO_x/year. [District Rule 2201]
12. The amount of digester gas sent through the biofilter serving the air stripper and solids dryer shall not exceed 1,840 scfm. [District Rule 4102]
13. The amount of digester gas sent through the biofilter serving the receiving pit shall not exceed 1,440 scfm. [District Rule 4102]
14. Emissions from the biofilter serving the air stripper shall not exceed 7 ppmv-H₂S. [District Rule 4102]
15. Emissions from the biofilter serving the receiving pit shall not exceed 2 ppmv-H₂S. [District Rule 4102]
16. Source testing to measure NO_x, CO and VOC emissions from the digester-fired flare shall be conducted within 120 days of initial start-up and at least once every twelve (12) months thereafter. [District Rule 2201]
17. Within 60 days of production of wet cake/pressed fiber, the VOC content of the material shall be determined using EPA Test Methods 413.2 and 418.1 and EPA Test Method 8260, and if necessary EPA Test Method 204 and 204D with either EPA Test Method 25A and 18 or SCAQMD Test Method 25.3, or an alternative method approved by the District. If VOC emissions are greater than two pounds per day (based on maximum throughput of the loaded out material), the permittee shall submit an Authority to Construct application for the wet cake/pressed fiber loadout operation within 15 days of the test results. [District Rule 2201]
18. During commissioning, the sulfur content of the digester gas combusted in each flare shall be monitored and recorded weekly. [District Rule 2201]
19. After commissioning, the sulfur content of the digester gas combusted in each flare shall be monitored and recorded monthly. After eight (8) consecutive monthly tests show compliance, the digester gas sulfur content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the digester gas sulfur content limit of this permit, then monthly monitoring shall resume and continue until eight consecutive months of monitoring show compliance with the gas sulfur content limit. Once compliance with the gas sulfur content limit is shown for eight consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the sulfur content of the digester gas 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]
20. After commissioning, the H₂S content of the digester gas at the outlet of the biofilter serving the air stripper shall be monitored and recorded monthly. After eight (8) consecutive monthly tests show compliance, the digester gas H₂S content monitoring frequency may be reduced to once every calendar quarter. If quarterly monitoring shows a violation of the digester gas H₂S content limit of this permit, then monthly monitoring shall resume and continue until eight consecutive months of monitoring show compliance with the gas H₂S content limit. Once compliance with the gas H₂S content limit is shown for eight consecutive months, then the monitoring frequency may return to quarterly. Monitoring of the H₂S content of the digester gas shall not be required if the air stripper does not operate during that period. Records of the results of monitoring of the digester gas H₂S content shall be maintained. [District Rule 4102]

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CONDITIONS CONTINUE ON NEXT PAGE

21. Monitoring of the digester gas sulfur content shall be performed using a Testo 350 XL portable emission monitor; District-approved in-line H₂S monitors; gas detection tubes calibrated for H₂S; District-approved source test methods, including EPA Method 11 or EPA Method 15, ASTM Method D1072, D4084, and D5504; or an alternative method approved by the District. Prior to utilization of in-line monitors to demonstrate compliance with the digester gas sulfur content limit of this permit, the permittee shall submit details of the proposed monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201]
22. For source test purposes, NO_x emissions from the flare shall be determined using EPA Method 19 on a heat input basis, or EPA Method 3A, EPA Method 7E, or ARB Method 100 on a ppmv basis. [District Rule 2201]
23. For source test purposes, CO emissions from the flare shall be determined using EPA Method 10 or 10B, ARB Methods 1 through 5 with 10, or ARB Method 100. [District Rule 2201]
24. For source test purposes, VOC emissions from the flare shall be determined using EPA Method 25 or 25a. [District Rule 2201]
25. Stack gas oxygen (O₂) shall be determined using EPA Method 3A, EPA Method 7E, or ARB Method 100. [District Rule 2201]
26. Operator shall determine digester gas fuel higher heating value annually by ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rule 2201]
27. 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]
28. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rule 1081]
29. The results of each source test shall be submitted to the District within 60 days of completion of the source test. [District Rule 1081]
30. Permittee shall maintain daily and monthly records of quantity of digester gas combusted in the flare, quantity of digester gas sent to each biofilter, and annual test results of higher heating value of digester gas. [District Rules 1070 and 2201]
31. The facility shall maintain records of annual throughput, material usage, or other information necessary to demonstrate that facility-wide emissions are less than ten tons per year for both NO_x and VOC. [District Rule 4311]
32. All records shall be maintained and retained on-site for a period of at least 5 years and shall be made available for District inspection upon request. [District Rule 1070]

DRAFT

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
DRAFT

PERMIT NO: S-8153-4-0

LEGAL OWNER OR OPERATOR: COLONY ENERGY PARTNERS-TULARE, LLC
MAILING ADDRESS: 4940 CAMPUS DRIVE, SUITE C
NEWPORT BEACH, CA 92660

LOCATION: PAIGE AVE (WEST OF ENTERPRISE STREET)
TULARE, CA

EQUIPMENT DESCRIPTION:

831 BHP MWM MODEL TCG 2016 V12 C LEAN BURN NATURAL GAS-FIRED IC ENGINE WITH TURBOCHARGER, INTERCOOLER, AIR/FUEL RATIO CONTROLLER, POSITIVE CRANKCASE VENTILATION, AND SELECTIVE CATALYTIC REDUCTION WITH UREA INJECTION COGENERATION SYSTEM

CONDITIONS

1. Upon implementation of the modification and startup of the equipment authorized by this Authority to Construct (ATC), ATCs S-8153-2-0 and '3-0 shall be cancelled. [District Rule 2201]
2. {1407} 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]
3. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
4. {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]
5. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
6. {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]
7. This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. [District Rule 4702]
8. This engine shall be operated and maintained in proper operating condition according to the manufacturer's specifications. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]

CONDITIONS CONTINUE ON NEXT PAGE

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

Seyed Sadredin, Executive Director APCO

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DAVID WARNER, Director of Permit Services

S-8153-4-0 - Jun 19 2013 11:00AM - TOMS - Joint Inspection NOT Required

9. Air-to-fuel ratio controller(s) shall be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [District Rule 2201 and 40 CFR 60 Subpart JJJJ]
10. This engine shall be equipped with a nonresettable elapsed operating time meter and a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved alternative. [District Rules 2201 and 4702 and 40 CFR 60 Subpart JJJJ]
11. {1897} This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201]
12. Emissions from the IC engine when fired on natural gas shall not exceed any of the following limits: 9 ppmv @ 15% O₂ or 0.108 g-NO_x/bhp-hr, 0.0094 g-SO_x/bhp-hr (based on 1.0 grain-S/100 scf fuel), 0.033 g-PM₁₀/bhp-hr, 82.4 ppmv @ 15% O₂ or 0.60 g-CO/bhp-hr, or 36.1 ppmv @ 15% O₂ or 0.15 g-VOC/bhp-hr. [District Rules 2201 and 4702, and 40 CFR 60 Subpart JJJJ]
13. The ammonia (NH₃) emission concentration shall not exceed 5 ppmvd @ 15% O₂. [District Rules 2201 and 4102]
14. Source testing to measure natural gas fuel combustion NO_x, CO, VOC and ammonia emissions from this unit shall be conducted within 60 days of initial start-up and once every 8,760 hours of operation or 24 months, whichever comes first, thereafter. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]
15. The following test methods shall be used: NO_x (ppmv) - EPA Method 7E or ARB Method 100, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, and VOC (ppmv) - EPA Method 25A or 25B, or ARB Method 100. [District Rules 1081 and 4702]
16. Source testing for ammonia slip shall be conducted utilizing BAAQMD method ST-1B. [District Rule 1081]
17. The permittee shall monitor and record the stack concentration of NO_x, CO, O₂, and NH₃ at least once every month (in which a source test is not performed). NO_x, CO, and O₂ concentrations shall be performed using a portable emission monitor that meets District specifications. NH₃ monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
18. If the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, or the NH₃ concentrations corrected to 15% O₂, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]
19. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings evenly spaced out over the 15 consecutive-minute period. [District Rule 4702]
20. The permittee shall maintain records of: (1) the date and time of NO_x, CO, O₂, and NH₃ measurements, (2) the O₂ concentration in percent and the measured NO_x, CO, and NH₃ concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH₃ emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]

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CONDITIONS CONTINUE ON NEXT PAGE

21. The permittee shall submit an analysis showing the natural gas fuel sulfur content at least once every year. Valid purchase contracts, supplier certifications, tariff sheets, or transportation contracts may be used to satisfy this requirement, provided they establish the fuel parameters mentioned above. [District Rules 2201 and 4702]
22. For initial emissions source testing, the arithmetic average of three 60-consecutive-minute test runs shall apply. Each test run shall be conducted within 10 percent of 100 percent peak (or the highest achievable) load. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. NO_x, CO and VOC concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]
23. {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]
24. Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]
25. The results of each source test shall be submitted to the District and EPA within 60 days after completion of the source test. [District Rule 1081 and 40 CFR 60 Subpart JJJJ]
26. 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]
27. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: total hours of operation, type and quantity of fuel used, maintenance or modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]
28. Notification of the date construction of this engine commenced shall be submitted to the District and EPA and shall be postmarked no later than 30 days after such date as construction commenced. The notification shall contain the following information: 1) Name and address of the owner or operator; 2) The address of the affected source; 3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement; 4) Emission control equipment; and 5) Fuel used. [40 CFR 60 Subpart JJJJ]
29. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702]

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT

PERMIT NO: S-8153-5-0

LEGAL OWNER OR OPERATOR: COLONY ENERGY PARTNERS-TULARE, LLC
MAILING ADDRESS: 4940 CAMPUS DRIVE, SUITE C
NEWPORT BEACH, CA 92660

LOCATION: PAIGE AVE (WEST OF ENTERPRISE STREET)
TULARE, CA

EQUIPMENT DESCRIPTION:

831 BHP MWM MODEL TCG 2016 V12 C LEAN BURN NATURAL GAS-FIRED IC ENGINE WITH TURBOCHARGER, INTERCOOLER, AIR/FUEL RATIO CONTROLLER, POSITIVE CRANKCASE VENTILATION, AND SELECTIVE CATALYTIC REDUCTION WITH UREA INJECTION COGENERATION SYSTEM

CONDITIONS

1. Upon implementation of the modification and startup of the equipment authorized by this Authority to Construct (ATC), ATCs S-8153-2-0 and '3-0 shall be cancelled. [District Rule 2201]
2. {1407} 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]
3. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
4. {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]
5. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
6. {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]
7. This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. [District Rule 4702]
8. This engine shall be operated and maintained in proper operating condition according to the manufacturer's specifications. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]

CONDITIONS CONTINUE ON NEXT PAGE

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

Seyed Sadredin, Executive Director, APCO

DAVID WARNER, Director of Permit Services

S-8153-5-0; Jun 19 2013 11:00AM - TOMS : Joint Inspection NOT Required

9. Air-to-fuel ratio controller(s) shall be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [District Rule 2201 and 40 CFR 60 Subpart JJJJ]
10. This engine shall be equipped with a nonresettable elapsed operating time meter and a non-resettable, totalizing mass or volumetric fuel flow meter or other APCO approved alternative. [District Rules 2201 and 4702 and 40 CFR 60 Subpart JJJJ]
11. {1897} This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201]
12. Emissions from the IC engine when fired on natural gas shall not exceed any of the following limits: 9 ppmv @ 15% O₂ or 0.108 g-NO_x/bhp-hr, 0.0094 g-SO_x/bhp-hr, 0.033 g-PM₁₀/bhp-hr, 82.4 ppmv @ 15% O₂ or 0.60 g-CO/bhp-hr, or 36.1 ppmv @ 15% O₂ or 0.15 g-VOC/bhp-hr. [District Rules 2201 and 4702, and 40 CFR 60 Subpart JJJJ]
13. The ammonia (NH₃) emission concentration shall not exceed 5 ppmvd @ 15% O₂. [District Rules 2201 and 4102]
14. Source testing to measure natural gas fuel combustion NO_x, CO, VOC and ammonia emissions from this unit shall be conducted within 60 days of initial start-up and once every 8,760 hours of operation or 24 months, whichever comes first, thereafter. [District Rule 4702 and 40 CFR 60 Subpart JJJJ]
15. The following test methods shall be used: NO_x (ppmv) - EPA Method 7E or ARB Method 100, CO (ppmv) - EPA Method 10 or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, and VOC (ppmv) - EPA Method 25A or 25B, or ARB Method 100. [District Rules 1081 and 4702]
16. Source testing for ammonia slip shall be conducted utilizing BAAQMD method ST-1B. [District Rule 1081]
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