San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

FEB 2 7 2019

Philip Verwey
Aligned Digester Cooperative LLC
19765 13th Ave
Hanford, CA 93230

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: C-9218
Project Number: C-1172070

Dear Mr. Verwey:

Enclosed for your review and comment is the District's analysis of Aligned Digester Cooperative LLC's application for an Authority to Construct for the installation of a digester gas production and storage operation, including a covered lagoon anaerobic digester and a 44.8 MMBtu/hr backup/emergency flare, at 21519 Road 4, Chowchilla.

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. Jonah Aiyabei of Permit Services at (559) 230-5910.

Sincerely,

for Arnaud Marjollet
Director of Permit Services

AM:jka

Enclosures

cc: Tung Le, CARB (w/ enclosure) via email

Samir Sheikh
Executive Director/Air Pollution Control Officer

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www.valleyair.org www.healthyairliving.com

Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Manure Digester System with Backup/Emergency Flare

Facility Name:	Aligned Digester Cooperative LLC	Date:	February 12, 2019
Mailing Address:	19765 13th Ave Hanford, CA 93230	Engineer:	Jonah Aiyabei
		Lead Engineer:	Jerry Sandhu
Applicant:	Philip Verwey		
Telephone:	(559) 908-1556		
E-Mail:	brentv@alignedigesters.com		
Application #(s):	C-9218-1-0		
Project #:	C-1172070		
Deemed Complete:	June 27, 2017		

I. Proposal

Aligned Digester Cooperative LLC has applied for an Authority to Construct (ATC) permit for the installation of a digester gas production and storage operation consisting of a covered lagoon anaerobic digester, digester gas conditioning and compression equipment, a digester gas storage tank (pressure vessel), and a 44.8 MMBtu/hr emergency backup flare. Conditioned fuel grade digester gas will be stored in the pressure vessel and shipped to offsite consumers periodically. The flare will be used for onsite disposal of digester gas during emergency situations or for backup purposes when storage capacity is temporarily unavailable.

Although the digester gas operation will be located at the current site of Redtop Jerseys (facility #C-6831), it will be installed, operated, and maintained solely by Aligned Digester Cooperative LLC, which has entered into various pertinent agreements with the dairy for this purpose. The responsibility of the dairy will be limited to supplying the manure feedstock and disposing of the post-digester effluent, in a manner that is consistent with its pre-existing permitted operations. In addition, the digester gas will not be used by the dairy, but will be sold to customers elsewhere.

Since the dairy and the proposed digester gas operation will be separately owned and operated, and belong to different two-digit Standard Industrial Classification (SIC) codes (Industry Group 24: Dairy Farms and Industry Group 49: Electric, Gas, and Sanitary Services), they are separate stationary sources, pursuant to Section 3.39 of District Rule 2201.

II. Applicable Rules

Rule 2201	New and Modified Stationary Source Review Rule (2/18/16)
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 Emission 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 4801	Sulfur Compounds (12/17/92)
CH&SC §41700	Health Risk Assessment
CH&SC §42301.6	School Notice

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

III. Project Location

The proposed equipment will be located at 21519 Road 4, Chowchilla, CA. The equipment will not be located within 1,000 feet of the outer boundaries of any K-12 schools. The public notification requirement of California Health and Safety Code §42301.6 is therefore not applicable to this project.

IV. Process Description

Anaerobic Digester System

An anaerobic digester is a sealed basin or tank that is designed to accelerate and control the decomposition of organic matter by microorganisms in the absence of oxygen. Anaerobic decomposition results in the conversion of organic compounds in the substrate into methane (CH_4), carbon dioxide (CO_2), and water rather than intermediate volatile organic compounds (VOC). The gas generated by this process will be identified as digester gas in this project but may otherwise be referred to as biogas or waste gas.

The digester gas is expected to be comprised of 60-70% CH_4 and 30-40% CO_2 but may contain small amounts of nitrogen (N_2), oxygen (O_2), hydrogen sulfide (H_2S), ammonia (NH_3) and trace amounts of various VOC that remain from incomplete digestion of the volatile solids. Since the primary constituent of digester gas is methane (also the main component of natural gas), digester gas can be treated to remove H_2S and other impurities and used as fuel.

The proposed digester system will consist of a covered lagoon and will process only manure generated by the cattle at the host dairy (Redtop Jerseys LLC). The manure will be flushed from the cow housing areas at the dairy to a solid separation system prior to the digester system. The mechanical separation system will remove fibrous solids from the manure. After the separation system, the liquid manure will gravity flow into the digester. The liquid effluent from the digester will be pumped to the existing storage ponds at the dairy for use to irrigate and fertilize dairy's cropland.

The digester lagoon will be approximately 460 ft long, 360 ft wide at the top, and 24 ft deep, with a side slope of 2:1 and total capacity of approximately 20,700,000 gallons. The lagoon will be fitted with a high-density polyethylene (HDPE) membrane cover, under which a gas collection system consisting of perforated piping will be installed. The flexible digester cover also serves as a temporary storage facility for raw digester gas. A pressure/vacuum valve will be used to

regulate the volume of gas stored. When the gas is not continuously transferred out of the digester, it accumulates in the headspace under the digester cover. The cover gradually inflates as more gas accumulates under it; thus extending the available storage capacity. The applicant has stated that the proposed digester cover is capable of holding up to 3 days' worth of raw gas, assuming the digester is operating at maximum capacity. Except in the event of an emergency, the gas will be transferred out of the digester before the maximum holding capacity is reached. Venting of raw digester gas under non-emergency situations is not permitted.

Biogas Conditioning

From the gas collection system, the raw digester gas is piped into the gas conditioning and compression system where it is upgraded to fuel grade quality and compressed to the desired storage/transportation pressure. The conditioning system consists of the following steps, in the order shown:

(1) H_2S removal using iron sponge scrubbers
(2) Moisture removal using a knockout vessel and chiller
(3) VOC and siloxane removal using activated carbon adsorption beds
(4) Carbon dioxide removal using polymeric membranes

Iron sponge scrubbers contain a hydrated form of iron oxide which reacts with the H_2S in the biogas, resulting in the precipitation of sulfur in the form iron sulfide. The knockout vessel or drum uses gravitational force to remove liquid droplets suspended in the gas stream; while a chiller dehumidifies the gas by cooling (i.e. a drop in temperature causes water vapor content to condense out as liquid). Activated carbon removes VOC and siloxanes by adsorption.

The polymeric membranes used for carbon dioxide removal are designed to retain methane while allowing carbon dioxide to permeate through. Other trace impurities such as H_2S and water vapor will also permeate through the membrane more readily than methane, thus further purifying the retained methane. VOC is generally less permeable than methane, hence any trace VOC remaining in the biogas is expected to be mostly retained together with the methane. Membrane separation units are expected to remove up to 98% of the carbon dioxide present in biogas. The waste gas (i.e. tail gas) from this separation process will thus consist primarily of carbon dioxide, with small quantities of methane, and trace amounts of H_2S. This tail gas will be vented without further processing or treatment as it does not contain a recoverable amount of methane or significant quantities of any pollutants.

Backup/Emergency Flare

The proposed backup/emergency flare is primarily intended to be used during emergency situations requiring rapid destruction of significant quantities biogas at the digester site. Otherwise, the flare may also be used for minimal backup purposes such as during maintenance and testing, or when gas storage system's capacity is temporarily exceeded or temporarily unavailable for other reasons.

V. Equipment Listing

C-9218-1-0: DIGESTER GAS PRODUCTION AND STORAGE OPERATION CONSISTING OF ONE COVERED LAGOON ANAEROBIC DIGESTER (460 FT X 360 FT X 24 FT), ONE 44.8 MMBTU/HR BACKUP/EMERGENCY FLARE; AND PERMIT EXEMPT GAS COLLECTION, CONDITIONING, AND STORAGE EQUIPMENT INCLUDING HYDROGEN SULFIDE (H2S) REMOVAL SCRUBBER(S), KNOCKOUT VESSEL(S), COMPRESSOR(S), CHILLER(S), ACTIVATED CARBON ADSORPTION VESSEL(S), CARBON DIOXIDE SEPARATION MEMBRANE UNIT(S), AND STORAGE TANK(S)/PRESSURE VESSEL(S)

VI. Emission Control Technology Evaluation

Digester Gas

As previously stated, digester gas contains VOC and H_2S. Under normal operation, the digester system will capture 100% of the produced digester gas, including any entrained pollutants. The digester gas will then be treated and conditioned before storage or flaring. The treatment and conditioning process will significantly reduce the proportions of VOC and H_2S in the finished gas.

H_2S removal will be accomplished using at least two H_2S iron sponge scrubbers in series. An iron sponge scrubber consists of a vessel containing a hydrated form of iron oxide impregnated onto wood shavings or similar substrate. As the biogas passes through the iron sponge material, H_2S reacts with the iron oxide, resulting in the precipitation of sulfur in the form iron sulfide. The H_2S concentration will be reduced from a maximum of 4,000 ppmv in raw digester gas to a maximum of 4 ppmv in the treated gas.

Final treatment and conditioning will be accomplished using a series of at least two activated carbon adsorption vessels. Activated carbon has a large number of pores, which greatly increase the surface area for adsorption. Contaminants in the gas diffuse into these pores and are retained on the carbon surface due to both chemical and physical forces. The carbon adsorption vessels are primarily intended for the removal of VOC and siloxanes. The VOC control efficiency for carbon adsorption systems is generally 99% or greater. The proposed systems are expected to be particularly robust since siloxane is a catalyst poison that must be reduced to near zero levels in order for biogas to meet vehicle fuel standards.

Tail Gas

As previously discussed, tail gas exhausted from the carbon dioxide separation membrane units consists primarily of carbon dioxide, small quantities of methane, and trace amounts of VOC and H_2S. VOC and H_2S will have been reduced to trace levels before the biogas enters the membrane separation units. Since VOC has even lower permeability than methane, the post-separation tail gas is expected to contain even less VOC than the inlet gas. H_2S has a higher permeability than methane, hence a significant proportion of any H_2S remaining in the inlet gas is expected to permeate through the membrane and be emitted in the tail gas.

The applicant has provide the following data for the tail gas:

- Flow rate = 90 scfm
- Composition = 97.5 % CO_2, 1.6% CH_4, and < 3 ppm H_2S

In addition, it will be assumed that a maximum of 5% of the VOC in the inlet gas will be emitted in the tail gas.

Based on the above data and assumption, as well as other assumptions as stated in Section VII.A of this evaluation, the maximum daily emissions of VOC and H_2S in tail gas are estimated as follows:

VOC

- Maximum VOC content in tail gas (TG) = 0.005% by weight (10% in raw gas → 99% removal by activated carbon units → only 5% of residual expected in tail gas = 10 x 0.01 x 0.05), thus:

$$\frac{0.00005\ lb-VOC}{100\ lb-TG}\ x\ \frac{(0.016\ x\ 16+0.975\ x\ 44)\ lb-TG}{lb-mol}\ x\ \frac{lb-mol}{379.5\ ft^3}\ x\ \frac{5{,}400\ ft^3}{hr}\ x\ \frac{24\ hrs}{Day}=\frac{0.7\ lb-VOC}{Day}$$

H_2S

$$\frac{3\ ft^3 H2S}{10^6\ ft^3\ TG}\ x\ \frac{34.06\ lb\ H2S}{lb-mol}\ x\ \frac{lb-mol}{379.5\ ft^3}\ x\ \frac{5{,}400\ ft^3}{hr}\ x\ \frac{24\ hrs}{Day}=\frac{0.03\ lb-H2S}{Day}$$

As shown in the calculations above, the maximum VOC and H_2S emissions from tail gas are expected to be less than 2 lb/day each. The venting of tail gas is thus a low emitting unit that is not subject to permit requirements or emission controls.

Backup/Emergency Flare

Smokeless combustion (i.e. visible emissions not exceeding 5% in opacity) will be used as an indication of optimum flare function, which represents the highest design destruction efficiency for VOC with minimum emission of combustion pollutants such as PM and NOx.

VII. General Calculations

A. Assumptions

- The proposed digester system will result in an overall net reduction in VOC emissions from the dairy's liquid manure management system, since:
  - Manure that is currently stored in uncovered lagoons and ponds will instead be diverted into a closed digester vessel, thereby decreasing volatilization of VOC from the manure.
  - An anaerobic digester reduces VOC emissions by optimizing the conversion of manure volatile solids into methane instead of intermediary VOC compounds.

  A modification of the dairy's liquid manure management permit, if required, will be done under a separate project.

- District Policy SSP 2015 specifies that fugitive VOC emissions are not assessed for piping and components handling fluid streams with a VOC content of 10% or less by weight. The results of digester gas fuel analyses from similar operations have consistently demonstrated very low VOC content (less than 1% by weight). Therefore, the fugitive VOC emissions from the digester system are considered negligible, consistent with District Policy SSP 2015.
- Emissions from post-digester solids are considered negligible.
- Digester gas properties:
  - Molar composition is about 70% methane and 30% carbon dioxide, with trace amounts of hydrogen sulfide, VOC, and other compounds.[1]
  - Higher Heating Value = 700 Btu/scf (Based on 70% methane content, also used in other similar District projects)
  - EPA F-factor = 9,100 dscf/MMBtu (dry, adjusted to 60 °F), (Estimated based on previous digester gas fuel analyses for source tests)
  - Maximum sulfur content = 4,000 ppmv as H_2S (approximately 240 grains/100 scf; proposed by applicant as worst-case concentration in raw digester gas)
  - Molar specific volume = 379.5 scf/lb-mol (at 60°F)
- Molecular weights:
  - NOx (as NO_2) = 46 lb/lb-mol
  - CO_2 = 44 lb/lb-mol
  - NH_3 = 17 lb/lb-mol
  - VOC (as CH_4) = 16 lb/lb-mol
  - SOx (as SO_2) = 64.06 lb/lb-mol
- Flare parameters:
  - Maximum operation schedule is 24 hours/day and 500 hours/year
  - Maximum gas flow rate is 64,000 scf/hr (assuming acf ~ scf)
  - Equivalent maximum heat input rate is 44.8 MMBtu/hr (64,000 scf/hr x 700 Btu/scf)
  - VOC destruction efficiency = 98%[2]

[1] U.S. EPA AgSTAR (http://www2.epa.gov/agstar), "Market Opportunities for Biogas Recovery Systems at U.S. Livestock Facilities" (November 2011, http://www2.epa.gov/agstar/agstar-market-opportunities-report); "Anaerobic Digestion Overview", David Schmidt, University of Minnesota Department of Biosystems and Agricultural Engineering:.(http://www.extension.umn.edu/agriculture/manure-management-and-air-quality/manure-treatment/docs/anaerobic-digestion-overview.pdf); and "Anaerobic Digestion of Animal Wastes: Factors to Consider", ATTRA - National Sustainable Agriculture Information Service (https://attra.ncat.org/attra-pub/summaries/summary.php?pub=307)

[2] District BACT Guideline 5.8.12.

B. Emission Factors

The NOx emission factor (0.06 lb/MMBtu) is based on the Industry Standard NOx emission factor for digester gas flares[3] and District practice for permitting digester gas flares. The SOx emission factor (0.0113 lb/MMBtu) is based on the maximum sulfur content of the dairy digester gas proposed by the applicant (40 ppmv as H_2S). The emission factors for PM_{10} (0.015 lb/MMBtu) and CO (0.046 lb/MMBtu) are based on the values given for landfill gas-fired flares in AP-42, Draft Section 2.4 Municipal Solid Waste Landfills (October 2008). The VOC emission factor for the digester gas-fired flare (0.006 lb/MMBtu) was based on the VOC emission for landfill gas and digester gas-fired flares (2.50 g/MMBtu or 0.0055 lb/MMBtu) from the California Air Resources Board (ARB) Low Carbon Fuel Standard (LCFS) pathways for the production of LCFS fuels from landfill gas and digester gas,[4] and was also assumed to be similar to the AP-42 VOC emission factor for digester gas-fired turbines (0.0058 lb/MMBtu). The assumption that the AP-42 VOC emission factor for the digester gas-fired flare is similar to digester gas-fired turbines is conservative because AP-42, Draft Section 2.4 Municipal Solid Waste Landfills (October 2008) lists a typical VOC control efficiency of 97.7% for landfill gas-fired flares compared to 94.4% for landfill gas-fired turbines and greater VOC control efficiency would result in lower VOC emissions. Additionally, as noted above, the VOC content of dairy digester gas is generally negligible to very low. For example, for the quarterly dairy digester gas fuel analyses that were recently performed in August 2018 for Facilities S-8596, S-8637, and S-8638 the only hydrocarbon measured was methane and no VOCs were detected (per project S-1171914); therefore, using a VOC emission factor of 0.006 lb/MMBtu will result in a reasonably conservative estimate of VOC emissions from the flare.

The proposed emission factors for NOx, CO, and VOC are conservative as they are greater than the emission factors of 0.0426 lb-NOx/MMBtu, 0.0022 lb-CO/MMBtu, and 0.0023 lb-VOC/MMBtu measured during the 11/17/2010 source test performed for the dairy digester gas flare at Facility N-6311 (Fiscalini Farms and Fiscalini Dairy), and the proposed NOx emission factor is also greater than the emission factor given for landfill gas-fired flares in AP-42, Draft Section 2.4 Municipal Solid Waste Landfills (October 2008). As shown in the table below, the NOx emission factor is consistent with the permitted NOx emission limits for other digester gas-fired flares and the VOC emission factor is conservative compared to the VOC emission factors that have been used for other digester gas-fired flares.

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[3] John Zink® has previously indicated that the industry standard NO_X emission factor for biogas flares is 0.06 lb-NO_X/MMBtu. See: John Zink (March 1998) Ultra-Low Emission Enclosed Landfill Gas Flare – A Full Scale Factory Test. Presented at the ***Solid Waste Association of North America*** (***SWANA***) 21nd Annual Landfill Gas Symposium, Austin, Texas, March 1998. https://www.johnzinkhamworthy.com/wp-content/uploads/tp_UltraLowEmmission.pdf. John Zink® also recently stated that one of their standard flares is expected to comply with the 0.06 lb-NO_X/MMBtu emission limit when flaring low Btu gas from a digester gas refining process. See: Sacramento Metropolitan Air Quality management District (SMAQMD) BACT determination for flaring low Btu digester gas (July 25, 2017): http://www.airquality.org/StationarySources/Documents/Flare%20Waste%20Gas%20Low%20BTU%20BACT%20140.pdf

[4] Examples of ARB Low Carbon Fuel Standard (LCFS) pathways for landfill gas and digester gas are available at: https://www.arb.ca.gov/fuels/lcfs/092309lcfs_lfg_lng.pdf and https://www.arb.ca.gov/fuels/lcfs/2a2b/apps/wws2bm-rpt-082514.pdf ; Also see: https://www.arb.ca.gov/fuels/lcfs/2a2b/2a-2b-apps.htm

Examples of NOx and VOC Emission Limits for Digester Gas-Fired Flares			
Facility/Source	Description	NOx Emission Factor (lb/MMBtu)	VOC Emission Factor (lb/MMBtu)
Fiscalini Farms and Fiscalini Dairy: Dairy Digester Gas Flare	11/17/2010 Source Test Results for Permit N-6311-10	0.0426	0.0023
Hilmar Cheese Company: Cheese Wastewater Digester Gas Flare	Emission Limits for Permit N-1275-23-9	0.06	0.002
E&J Gallo Winery: Winery Wastewater Digester Gas Flare	Emission Limits for Permit C-447-226-13	0.06	0.002
Tulare City Wastewater Treatment Plant: Municipal Wastewater Digester Gas Flare	Emission Limits for Permit S-548-33	0.06	0.0027
South Coast Air Quality Management District (SCAQMD) Digester gas Flares[5]	Typical SCAQMD permit limit for NO_X from digester gas flares and SCAQMD source test data for VOC from digester gas flares	0.06	0.0045 (10 ppmv @ 3% O_2 as CH4)

It is reasonable to use the AP-42 emission factors for PM and CO from landfill gas-fired flares for the digester gas backup flare because landfill gas and digester gas are both types of digester gas, so they are expected to have similar properties and emissions. One of the main differences between landfill gas and digester gas is that digester gas will tend to have higher methane content and heating value, which would tend to increase thermal NO_X emissions from combustion of digester gas compared to landfill gas, while decreasing emissions that result from incomplete combustion, such as PM, CO, and VOC. Combustion of gaseous fuels will generally result in negligible to very low PM emissions and the chance of PM becoming entrained in the digester gas after collection from a digester system is insignificant.

The emission factors that will be used to calculate the potential to emit for the digester gas-fired backup flare are shown in the table below.

[5] Information on SCAQMD biogas flares NO_X and VOC emissions taken from the SCAQMD Final Environmental Assessment for Proposed Amended Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Internal Combustion Engines (December 2007), Appendix C. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/rule-1110.2/appc130.pdf?sfvrsn=4

Emissions Factors for Digester System Backup Flare			
Pollutant	**lb/MMBtu**	**lb/scf***	**Source**
NOx	0.06	4.20×10^{-5}	Industry Standard/District Practice for Permitting Digester gas Flares
SOx	0.9646	6.75×10^{-4}	4,000 ppmvd H2S in digester gas (Applicant Proposal)
PM_{10}	0.015	1.05×10^{-5}	AP-42 Draft Table 2.4.4 (October 2008) (Value for Landfill Gas Flares)
CO	0.046	3.22×10^{-5}	AP-42 Draft Table 2.4.4 (October 2008) (Value for Landfill Gas Flares)
VOC	0.006	4.20×10^{-6}	Based on ARB LCFS Pathway Digester gas Flare VOC EF/Also Conservatively Assumed to be similar to Digester Gas-Fired Turbines

*lb/scf equivalent = lb/MMBtu x 0.0007 MMBtu/scf.

SOx Emission Factor Calculation

$$\frac{4{,}000\ ft^3 H2S}{10^6\ ft^3\ DG} x \frac{32.06\ lb\ S}{lb-mol\ H2S} x \frac{lb-mol}{379.5\ ft^3} x \frac{64.06\ lb\ SO2}{32.06\ lb\ S} x \frac{1\ ft^3}{700\ Btu} x \frac{10^6\ Btu}{MMBtu} = 0.9646 \frac{lb\ SOx}{MMBtu}$$

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Since the proposed operation includes only new emissions units, PE1 = 0 for all affected pollutants.

2. Post Project Potential to Emit (PE2)

Since fugitive emissions from the digester system, gas conditioning equipment, and gas storage are considered negligible, combustion of the digester gas in the flare will be the only source of quantifiable emissions from the proposed operation.

The potential to emit for the flare will be calculated based on the maximum flare gas flow rate of 64,000 scf per hour, a maximum daily operation 24 hours, and a maximum annual operation limit of 500 hours for non-emergency purposes.

Daily PE

The daily PE for each pollutant is calculated as follows:

PE (lb/day) = [EF (lb/scf) x Gas flow rate (scf/hr) x Operation schedule (hrs/day)]

The daily PE is summarized in the following table:

Daily PE2 Summary							
Pollutant	**Emission Factor (lb/scf)**	**x**	**Gas Flow Rate (scf/hr)**	**x**	**Op. Schedule (hrs/day)**	**=**	**PE2 (lb/day)**
NO_X	4.20E-5	x	64,000	x	24	=	**64.5**
SO_X	6.75E-4	x	64,000	x	24	=	**1,036.8**
PM_{10}	1.05E-5	x	64,000	x	24	=	**16.1**
CO	3.22E-5	x	64,000	x	24	=	**49.5**
VOC	4.20E-6	x	64,000	x	24	=	**6.5**

Maximum Daily Gas Throughput and Heat Input

Gas throughput = (64,000 scf/hr) x (24 hr/day)
= (1,536,000 scf/day) / (1 x 10^6 scf/MMscf)
= 1.536 MMscf/day

Heat input = (1,536,000 scf/day) x (700 Btu/scf) / (1 x 10^6 Btu/MMBtu)
= 1,075.2 MMBtu/day

Annual PE

The annual PE for each pollutant is calculated as follows:

PE (lb/yr) = [EF (lb/scf) x Maximum gas flared annually (MMscf/yr) x 10^6 scf/MMscf]

The annual PE is summarized in the following table:

Annual PE2 Summary							
Pollutant	**Emission Factor (lb/scf)**	**x**	**Gas Flow Rate (scf/hr)**	**x**	**Op. Schedule (hrs/yr)**	**=**	**PE2 (lb/day)**
NO_X	4.20E-5	x	64,000	x	500	=	**1,344**
SO_X	6.75E-4	x	64,000	x	500	=	**21,600**
PM_{10}	1.05E-5	x	64,000	x	500	=	**336**
CO	3.22E-5	x	64,000	x	500	=	**1,030**
VOC	4.20E-6	x	64,000	x	500	=	**134**

Maximum Annual Gas Throughput and Heat Input

Gas throughput = (64,000 scf/hr) x (500 hr/yr)
= (32,0000 scf/yr) / (1 x 10^6 scf/MMscf)
= 32.0 MMscf/yr

Heat input = (32,000,000 scf/yr) x (700 Btu/scf) / (1 x 10^6 Btu/MMBtu)
= 22,400 MMBtu/yr

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

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

Since this is a new facility with no valid ATCs, PTOs, or ERCs, SSPE1 = 0 for all pollutants.

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

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

Since this is a new facility, the SSPE2 is based on the PE for the new permit unit, as determined in the preceding sections and summarized in the following table:

SSPE2 (lb/year)					
Permit Unit	**NO_X**	**SO_X**	**PM_{10}**	**CO**	**VOC**
ATC C-9218-1-0	1,344	21,600	336	1,030	134
SSPE2	**1,344**	**21,600**	**336**	**1,030**	**134**

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}**	**$PM_{2.5}$**	**CO**	**VOC**
SSPE1	0	0	0	0	0	0
SSPE2	1,344	21,600	336	179	1,030	134
Major Source Threshold	20,000	140,000	140,000	140,000	200,000	20,000
Major Source?	No	No	No	No	No	No

Note: $PM_{2.5}$ assumed to be equal to PM_{10}

As shown in the preceding table, the facility is not an existing major source and is not becoming a major source as a result of this project.

Rule 2410 Major Source Determination

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

PSD Major Source Determination (tons/year)						
	NO_2	VOC	SO_2	CO	PM	PM_{10}
Estimated Facility PE before Project Increase	0	0	0	0	0	0
PSD Major Source Thresholds	250	250	250	250	250	250
PSD Major Source ? (Y/N)	N	N	N	N	N	N

As shown in the table above, the facility is not an existing PSD Major Source for any regulated NSR pollutant expected to be emitted at this facility.

6. Baseline Emissions (BE)

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

Pursuant to District Rule 2201, BE = PE1 for:

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

Otherwise,

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

Since this project involves only a new emission unit, BE = PE1 = 0 for all pollutants.

7. SB 288 Major Modification

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

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.

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

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination for sources located in the SJV and which are emitted in this project are: (See 52.21 (b) (23) definition of significant)[6]

- NO_2 (as a primary pollutant)
- SO_2 (as a primary pollutant)
- CO
- PM
- PM_{10}
- VOC

Project Emissions Increase - New Major Source Determination

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

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

PSD Major Source Determination: Potential to Emit (tons/year)						
	NO_2	VOC	SO_2	CO	PM	PM_{10}
Total PE from New and Modified Units	0.7	0.1	10.8	0.5	0.2	0.2
PSD Major Source threshold	250	250	250	250	250	250
New PSD Major Source?	N	N	N	N	N	N

[6] Since this facility is not included in the specific source categories listed in 40 CFR 51.165, only non-fugitive emissions must be addressed for PSD purposes. The operation is designed to capture and remove sulfur/H_2S from the fuel, and any sulfur/H_2S that remains in the fuel as a contaminant will be converted almost entirely to SO_x during combustion. Thus, the only source of sulfur/H_2S emissions from this operation is fugitives that escape the capture and control mechanisms of the digester and fuel processing system.

As shown in the preceding table, the potential to emit for the project, by itself, does not exceed any PSD Major Source threshold. Rule 2410 is therefore not applicable and no further analysis is required.

10. Quarterly Net Emissions Change (QNEC)

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

VIII. Compliance Determination

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

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

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

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

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

As shown in Section VII.C.2 of this evaluation, the applicant is proposing to install a new digester system with a backup/emergency flare. The PE for the proposed flare is greater than 2 lb/day for NOx, SOx, PM_{10}, CO, and VOC. However, the flare is a control device for VOC emissions from the digester. VOC is the only pollutant from the emission unit (i.e. digester). NOx, SOx, PM_{10}, and CO emissions are incidental to the control device (i.e. byproducts of combustion in the flare). In accordance with District practice, BACT requirements are not applicable to control devices. Collateral emissions resulting solely from a control device are therefore not subject to BACT requirements. BACT is therefore triggered only for VOC.

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

As discussed in Section I of this evaluation, there are no emissions units being relocated from one stationary source to another. BACT is therefore not triggered under this category.

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

As discussed in Section I of this evaluation, there are no modified emissions units associated with this project. BACT is therefore not triggered under this category.

d. SB 288/Federal Major Modification

As discussed in Sections VII.C.7 and VII.C.8 above, this project does not constitute an SB 288 and/or federal major modification. BACT is therefore not triggered under this category.

2. BACT Guideline

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

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 BACT Analysis (see Appendix C), BACT has been satisfied with the following:

VOC: Open flare (98% control efficiency)

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
SSPE2	1,344	21,600	336	1,030	134
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	No	No	No	No	No

2. Quantity of Offsets Required

As shown above, the SSPE2 is not greater than the offset thresholds for all the 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
d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant, and/or
e. Any project which results in a Title V significant permit modification.

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

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

b. PE > 100 lb/day

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

PE > 100 lb/day Public Notice Thresholds			
Pollutant	**PE2 (lb/day)**	**Public Notice Threshold**	**Public Notice Triggered?**
NOx	64.5	100 lb/day	No
SOx	1,036.8	100 lb/day	Yes
PM_{10}	16.1	100 lb/day	No
CO	49.5	100 lb/day	No
VOC	6.5	100 lb/day	No

As shown in the table above, the PE for SOx is greater than 100 lb/day. Public noticing for PE > 100 lb/day purposes is therefore required.

c. Offset Threshold

The SSPE1 and SSPE2 are compared to the offset thresholds in the following table:

Offset Thresholds				
Pollutant	**SSPE1 (lb/year)**	**SSPE2 (lb/year)**	**Offset Threshold**	**Public Notice Required?**
NO_x	0	1,344	20,000 lb/year	No
SO_x	0	21,600	54,750 lb/year	No
PM_{10}	0	336	29,200 lb/year	No
CO	0	1,030	200,000 lb/year	No
VOC	0	134	20,000 lb/year	No

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

d. SSIPE > 20,000 lb/year

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

SSIPE Public Notice Thresholds					
Pollutant	**SSPE2 (lb/year)**	**SSPE1 (lb/year)**	**SSIPE (lb/year)**	**SSIPE Public Notice Threshold**	**Public Notice Required?**
NO_x	1,344	0	1,344	20,000 lb/year	No
SO_x	21,600	0	21,600	20,000 lb/year	Yes
PM_{10}	336	0	336	20,000 lb/year	No
CO	1,030	0	1,030	20,000 lb/year	No
VOC	134	0	134	20,000 lb/year	No

As shown above, the SSIPE for SOx is greater than 20,000 lb/year. Public noticing for SSIPE purposes is therefore required.

e. Title V Significant Permit Modification

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

2. Public Notice Action

As discussed above, public noticing is required for this project for PE greater than 100 lb/day and SSIPE greater than 20,000 lb/year. Public notice documents will be submitted to the California Air Resources Board (ARB) and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATCs for the proposed equipment.

D. Daily Emission Limits (DELs)

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

Proposed Rule 2201 (DEL) Conditions

- Only dairy manure digester gas shall be vented through this flare. [District Rule 2201]
- Flaring of digester gas for testing and maintenance, required regulatory purposes, and backup purposes shall not exceed either of the following limits: 1,075.2 MMBtu (equivalent to 1.536 MMscf @ 700 Btu/scf) in any one day and 22,400 MMBtu (equivalent to 32.0 MMscf @ 700 Btu/scf) any consecutive 365-day period. [District Rules 2201 and 4102]
- Emissions from the flare shall not exceed any of the following limits: 0.06 lb-NOx/MMBtu, 0.008 lb-PM10/MMBtu, 0.046 lb-CO/MMBtu, or 0.006 lb-VOC/MMBtu. [District Rule 2201]
- The VOC content of the digester gas shall not exceed 10% by weight. [District Rule 2201]
- The sulfur content of any digester gas combusted in this flare shall not exceed 4,000 ppmv as H_2S. The permittee may utilize an averaging period of up to 24 hours in length for demonstration of compliance with the digester gas sulfur content limit. [District Rules 2201 and 4801]

E. Compliance Assurance

1. Source Testing

No source testing is required for this unit.

2. Monitoring

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

- Digester gas sulfur content analysis shall be performed within 60 days of initial startup operation, and at least once every 12 months thereafter, using EPA Method 11 or EPA Method 15, as appropriate. Records of the digester gas sulfur content analysis shall be maintained and provided to the District upon request. [District Rule 2201]

- The sulfur content of the digester gas to be flared shall be monitored and recorded at least once every calendar quarter in which a digester gas sulfur content analysis is not performed. If quarterly monitoring shows a violation of the sulfur content limit of this permit, monthly monitoring will be required until six consecutive months of monitoring show compliance with the sulfur content limit. Once compliance with the sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring shall not be required during periods in which the flare does not operate. [District Rule 2201]

- Monitoring of the digester gas sulfur content shall be performed using gas detection tubes calibrated for H2S; a Testo 350 XL portable emission monitor; a continuous fuel gas monitor that meets the requirements specified in SCAQMD Rule 431.1, Attachment A; District-approved source test methods, including EPA Method 15, ASTM Method D1072, D4084, and D5504; District-approved in-line H2S monitors; or an alternative method approved by the District. Prior to utilization of in-line monitors to demonstrate compliance with the digester gas sulfur content limit of this permit, the permittee shall submit details of the proposed monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201]

3. Recordkeeping

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

- Records of hydrogen sulfide analyzer(s) installed or utilized and the calibration records of such analyzer(s) shall be maintained. Records are only required on such analyzer(s) utilized to demonstrate compliance with this permit. [District Rule 2201]

- The permittee shall maintain flare operation records including the dates of operation, the purpose of operation, and the daily and annual quantities of digester gas flared, in standard cubic feet (scf). [District Rule 2201]

- All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. Records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4311]

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

5. Other Rule 2201 (NSR) Requirements

The following NSR requirements, including design/manufacturer specifications, maintenance and operation requirements, and annual throughput limits, as outlined in the following conditions, will also be included on the permit:

- {271} All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]

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

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

- The flare shall be equipped with an operational, non-resettable, totalizing mass or volumetric fuel flow meter or other District-approved alternative method to determine the quantity of gas flared. [District Rule 2201]

- The flare shall be operated only for testing and maintenance, required regulatory purposes, backup, and emergency purposes. An emergency is a situation or condition arising from a sudden and reasonably unforeseeable and unpreventable event beyond the control of the operator, such as, but not limited to, unpreventable equipment failure, natural disasters, acts of war or terrorism, and external power curtailment (except due to interruptible power service agreements). An emergency situation requires immediate corrective action to restore safe operation. [District Rules 2201 and 4102]

F. Ambient Air Quality Analysis (AAQA)

Section 4.14 of District Rule 2201 requires that an AAQA be conducted for the purpose of determining whether a new or modified stationary source will cause or make worse a violation of an air quality standard. The District's Technical Services Division conducted the required analysis. Refer to Appendix D of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO_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 PM_{10} 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 PM_{10} and $PM_{2.5}$.

Rule 2410 Prevention of Significant Deterioration

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

Rule 2520 Federally Mandated Operating Permits

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

Rule 4101 Visible Emissions

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

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

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

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

Rule 4102 Nuisance

Rule 4102 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained.

The following condition will be placed on the permit to ensure compliance with the requirements of this rule:

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

California Health & Safety Code §41700 Health Risk Assessment

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

An HRA is not required for a project with a total facility prioritization score of less than or equal to 1.0. According to the Technical Services Memo for this project (Appendix D), the total facility prioritization score including this project was less than or equal to 1.0. Therefore, no further analysis is required to determine the impact from this project and compliance with the District's Risk Management Policy is expected.

The following conditions will be placed on the permit to ensure compliance with the HRA parameters and assumptions:

- 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]

- The flare shall be operated only for testing and maintenance, required regulatory purposes, backup, and emergency purposes. An emergency is a situation or condition arising from a sudden and reasonably unforeseeable and unpreventable event beyond the control of the operator, such as, but not limited to, unpreventable equipment failure, natural disasters, acts of war or terrorism, and external power curtailment (except due to interruptible power service agreements). An emergency situation requires immediate corrective action to restore safe operation. [District Rules 2201 and 4102]

- Flaring of digester gas for testing and maintenance, required regulatory purposes, and backup purposes shall not exceed either of the following limits: 1,075.2 MMBtu (equivalent to 1.536 MMscf @ 700 Btu/scf) in any one day and 22,400 MMBtu (equivalent to 32.0 MMscf @ 700 Btu/scf) in any consecutive 365-day period. [District Rules 2201 and 4102]

Rule 4201 Particulate Matter Concentration

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

$$0.015\ \frac{lb-PM}{1\,MMBtu}\times\frac{1\,MMBtu}{9{,}100\,dscf}\times\frac{7{,}000\,grain}{1\,lb-PM}=\ 0.012\ \frac{grain}{dscf}$$

Since 0.012 grain/dscf is less than 0.1 grain/dscf, compliance with this rule is expected.

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

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

Rule 4311 Flares

The purpose of this rule is to limit the emissions of volatile organic compounds (VOCs) and oxides of nitrogen (NO_X) 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 NO_X.

Section 6.1 requires that records shall be maintained, retained on-site for a minimum of five years, and made available to the APCO, ARB, and EPA upon request.

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 conditions will be placed on the permit to ensure compliance with this recordkeeping requirement:

- The permittee shall maintain records of annual throughput, material usage, or other information necessary to demonstrate that this stationary source (C-9218) has the potential to emit, for all processes, less than ten (10.0) tons per year of VOC and less than ten (10.0) tons per year of NOx. [District Rule 4311]

- All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. Records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4311]

Compliance with the requirements of this rule is expected.

Rule 4801 Sulfur Compounds

The purpose of this District Rule 4801 is to limit the emissions of sulfur compounds. The limit is that sulfur compound emissions (as SO_2) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

Volume of SO_X as (SO_2) = (n x R x T) ÷ P

Where:

n = moles SO_X

T (standard temperature) = 60 °F or 520 °R

R (universal gas constant) = $\frac{10.73 \text{psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot {}^\circ\text{R}}$

To demonstrate compliance with the sulfur compound emission limit of Rule 4801, the maximum sulfur compound emissions from the flare will be calculated using the maximum sulfur content allowed for the digester gas, which is 4,000 ppmv, equivalent to 0.9646 lb-SO_X/MMBtu.

$$0.9646\ \frac{lb}{MMBtu} \times \frac{1\ MMBtu}{9{,}100 scf_{exhaust}} \times \frac{1\ lb \cdot mol}{64\ lb \cdot SO_2} \times \frac{10.73\ psi \cdot ft^3}{lb \cdot mol \cdot {}^\circ R} \times \frac{520 {}^\circ R}{14.7\ psi} \times 1{,}000{,}000\ ppm = 630\ \text{ppmv}$$

Since 630 ppmv is ≤ 2000 ppmv, the equipment is expected to comply with Rule 4801. The following conditions will be placed on the permit to ensure compliance:

- The sulfur content of any digester gas combusted in this flare shall not exceed 4,000 ppmv as H_2S. The permittee may utilize an averaging period of up to 24 hours in length for demonstration of compliance with the digester gas sulfur content limit. [District Rules 2201 and 4801]

California Health & Safety Code §42301.6 (School Notice)

The District has verified that the project site is not within 1,000 feet of the outer boundaries of any K-12 schools. Therefore, pursuant to California Health and Safety Code §42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

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

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

Greenhouse Gas (GHG) Significance Determination

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

District CEQA Findings

The County of Madera (County) is the public agency having principal responsibility for approving the Project. As such, the County served as the Lead Agency for the Project. The County determined the project to be exempt from CEQA according to CEQA Guidelines §15301 (Existing Facilities)

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381).

The District's engineering evaluation of the project (this document) demonstrates that compliance with District rules and permit conditions would reduce Stationary Source emissions from the project to levels below the District's thresholds of significance for criteria pollutants. Thus, the District concludes that through a combination of project design elements and permit conditions, project specific stationary source emissions will be reduced to less than significant levels. The District does not have authority over any of the other project impacts and has, therefore, determined that no additional findings are required (CEQA Guidelines §15096(h)).

Indemnification Agreement/Letter of Credit Determination

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

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

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Issue ATC C-9218-1-0 subject to the permit conditions on the attached draft ATC in Appendix A.

X. Billing Information

Annual Permit Fees			
Permit Number	**Fee Schedule**	**Fee Description**	**Annual Fee**
C-9218-1-0	3020-02-H	44.8 MMBtu/hr Flare	$1,183

Appendices

A: Draft ATC
B: BACT Guideline 5.8.12
C: BACT Analysis
D: RMR and AAQA Summary
E: QNEC

APPENDIX A

Draft ATC

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: C-9218-1-0

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: ALIGNED DIGESTER COOPERATIVE LLC
MAILING ADDRESS: 19765 13TH AVENUE
HANFORD, CA 93230

LOCATION: 21463 ROAD 4
CHOWCHILLA, CA 93610

EQUIPMENT DESCRIPTION:
DIGESTER GAS PRODUCTION AND STORAGE OPERATION CONSISTING OF ONE COVERED LAGOON ANAEROBIC DIGESTER (460 FT X 360 FT X 24 FT), ONE 44.8 MMBTU/HR BACKUP/EMERGENCY FLARE; AND PERMIT EXEMPT GAS COLLECTION, CONDITIONING, AND STORAGE EQUIPMENT INCLUDING HYDROGEN SULFIDE (H2S) REMOVAL SCRUBBER(S), KNOCKOUT VESSEL(S), COMPRESSOR(S), CHILLER(S), ACTIVATED CARBON ADSORPTION VESSEL(S), CARBON DIOXIDE SEPARATION MEMBRANE UNIT(S), AND STORAGE TANK(S)/PRESSURE VESSEL(S)

CONDITIONS

1. {271} All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]
2. {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]
3. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
4. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. {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]
6. Only dairy manure digester gas shall be vented through this flare. [District Rule 2201]
7. A flame shall be present at all times whenever combustible gases are vented through the flare. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services
C-9218-1-0 Feb 12 2019 3:52PM -- AIYABEIJ : Joint Inspection NOT Required

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

9. The flare shall be equipped with an operational, non-resettable, totalizing mass or volumetric fuel flow meter or other District-approved alternative method to determine the quantity of gas flared. [District Rule 2201]

10. The flare shall be operated only for testing and maintenance, required regulatory purposes, backup, and emergency purposes. An emergency is a situation or condition arising from a sudden and reasonably unforeseeable and unpreventable event beyond the control of the operator, such as, but not limited to, unpreventable equipment failure, natural disasters, acts of war or terrorism, and external power curtailment (except due to interruptible power service agreements). An emergency situation requires immediate corrective action to restore safe operation. [District Rules 2201 and 4102]

11. Flaring of digester gas for testing and maintenance, required regulatory purposes, and backup purposes shall not exceed either of the following limits: 1,075.2 MMBtu (equivalent to 1.536 MMscf @ 700 Btu/scf) in any one day and 22,400 MMBtu (equivalent to 32.0 MMscf @ 700 Btu/scf) in any consecutive 365-day period. [District Rules 2201 and 4102]

12. Emissions from the flare shall not exceed any of the following limits: 0.06 lb-NOx/MMBtu, 0.015 lb-PM10/MMBtu, 0.046 lb-CO/MMBtu, or 0.006 lb-VOC/MMBtu. [District Rule 2201]

13. The VOC content of the digester gas shall not exceed 10% by weight. [District Rule 2201]

14. The sulfur content of any digester gas combusted in this flare shall not exceed 4,000 ppmv as H2S. The permittee may utilize an averaging period of up to 24 hours in length for demonstration of compliance with the digester gas sulfur content limit. [District Rules 2201 and 4801]

15. Digester gas sulfur content analysis shall be performed within 60 days of initial startup operation, and at least once every 12 months thereafter, using EPA Method 11 or EPA Method 15, as appropriate. Records of the digester gas sulfur content analysis shall be maintained and provided to the District upon request. [District Rule 2201]

16. The sulfur content of the digester gas to be flared shall be monitored and recorded at least once every calendar quarter in which a digester gas sulfur content analysis is not performed. If quarterly monitoring shows a violation of the sulfur content limit of this permit, monthly monitoring will be required until six consecutive months of monitoring show compliance with the sulfur content limit. Once compliance with the sulfur content limit is shown for six consecutive months, then the monitoring frequency may return to quarterly. Monitoring shall not be required during periods in which the flare does not operate. [District Rule 2201]

17. Monitoring of the digester gas sulfur content shall be performed using gas detection tubes calibrated for H2S; a Testo 350 XL portable emission monitor; a continuous fuel gas monitor that meets the requirements specified in SCAQMD Rule 431.1, Attachment A; District-approved source test methods, including EPA Method 15, ASTM Method D1072, D4084, and D5504; District-approved in-line H2S monitors; or an alternative method approved by the District. Prior to utilization of in-line monitors to demonstrate compliance with the digester gas sulfur content limit of this permit, the permittee shall submit details of the proposed monitoring system, including the make, model, and detection limits, to the District and obtain District approval for the proposed monitor(s). [District Rule 2201]

18. Records of hydrogen sulfide analyzer(s) installed or utilized and the calibration records of such analyzer(s) shall be maintained. Records are only required on such analyzer(s) utilized to demonstrate compliance with this permit. [District Rule 2201]

19. The permittee shall maintain flare operation records including the dates of operation, the purpose of operation, and the daily and annual quantities of digester gas flared, in standard cubic feet (scf). [District Rule 2201]

20. The permittee shall maintain records of annual throughput, material usage, or other information necessary to demonstrate that this stationary source (C-9218) has the potential to emit, for all processes, less than ten (10.0) tons per year of VOC and less than ten (10.0) tons per year of NOx. [District Rule 4311]

21. All records shall be maintained and retained for a minimum of five (5) years, and shall be made available for District inspection upon request. Records may be maintained and submitted in an electronic format approved by the District. [District Rules 2201 and 4311]

APPENDIX B

BACT Guideline 5.8.12

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 5.8.12*

Last Update: 08/02/2018

Dairy Manure Digester with Backup/Emergency Flare

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

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

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

APPENDIX C

BACT Analysis

Top-Down BACT Analysis

BACT Analysis for VOC Emissions

a. Step 1 - Identify all control technologies

The following options were identified from Guideline 5.8.12:

1) Open flare (98% Control Efficiency) – Achieved in Practice
2) ULE Enclosed flare (99% Control Efficiency) – Technologically Feasible

b. Step 2 - Eliminate technologically infeasible options

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

c. Step 3 - Rank remaining options by control effectiveness

1) ULE Enclosed flare (99% Control Efficiency) – Technologically Feasible

2) Open flare (98% Control Efficiency) – Achieved in Practice

d. Step 4 - Cost Effectiveness Analysis

Option 1: ULE Enclosed Flare (99% Control Efficiency)

Cost

The following cost estimates recently obtained for project C-1162454 (finalized on November 6, 2018) will be used for this project:

- $240,000 (12 MMBtu/hr CEB-350, per Mr. Phanindra Kondagari, representative for Aereon, (512) 836-9473)
- $355,000 (13 MMBtu/hr ZULE Flare System, per Mr. Ryan Morgan, representative for John Zink, (918) 234-1800)

The cost estimates provided are assumed to reflect budget prices for flare systems equipped with all the standard manufacturer features (e.g. control panels, pilot and auto-ignition systems). Since flare projects are highly custom, there is no way to make reliable estimates for additional costs such as installation and recurring operation and maintenance.

The lower of the capital cost estimates provided ($240,000) will be used in this analysis.

The equivalent annual cost is calculated as shown below:

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

A = equivalent annual control equipment capital cost

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

i = interest rate (generally assumed to be 10%, unless the applicant demonstrates that a different rate is more representative of the specific operation)

n = equipment life (generally assumed to be 10 years, unless the applicant demonstrates that a different rate is more representative of the specific operation)

$$A = \$240{,}000 \times \frac{0.1(1+0.1)^{10}}{(1+0.1)^{10} - 1}$$

$$= \$39{,}059/yr$$

No operation costs were obtained for this control option. If the technology is determined not to be cost effective based on the capital costs alone, then consideration of the operation costs will not be necessary, since such additional costs would only remove the technology even farther from the cost effectiveness threshold.

Emission Reduction

Pursuant to District practice, Emission Reduction = District Standard Emissions – Emissions with Technologically Feasible BACT

Based on the VOC emission rate (0.0092 lb/MMBtu) and control efficiency (98%) discussed in Section III.C.1, a ULE enclosed flare VOC control efficiency of 99%, the maximum heat input rating of the proposed flare (44.8 MMBtu/hr), and the proposed maximum annual operation schedule (500 hrs/yr), the VOC reduction is calculated as follows:

Uncontrolled VOC emission rate = (0.0092 lb/MMBtu)/(1 – 0.98) = 0.46 lb/MMBtu

ULE enclosed flare VOC emission rate = (0.46 lb/MMBtu) x (1 – 0.99) = 0.0046 lb/MMBtu

VOC reduction = [(0.0092 – 0.0046) lb/MMBtu] x 44.8 MMBtu/hr x 500 hrs/yr x (1 ton/2,000 lb)
= 0.05 tons/yr

Cost of Reduction

Cost of reduction = [Cost ($/yr)] / [VOC Reduction (tons/yr)]
= ($39,059/yr) / (0.05 tons/yr)
= $781,180/ton

Cost Effectiveness

Based on the minimum possible capital cost, and not taking recurring annual operating costs into consideration, the cost of reduction for a ULE enclosed flare ($781,180/ton) is greater than the cost effectiveness threshold ($17,500/ton). Therefore, this control technology option is considered not cost effective and is eliminated from further consideration.

Option 2: Open Flare (98% Control Efficiency)

As previously stated in Step 1, this control option is achieved in practice. Pursuant to the District's BACT policy, cost effectiveness analysis is not required for control alternatives which are deemed achieved-in-practice, except for achieved in practice alternate basic equipment or process.

e. Step 5 - Select BACT

Pursuant to the District's BACT policy, the most effective control technology not eliminated in Step 4 shall be selected as BACT. Therefore, the use of an open flare with a 98% control efficiency is selected as BACT.

APPENDIX D

RMR and AAQA Summary

San Joaquin Valley Air Pollution Control District
Risk Management Review and Ambient Air Quality Analysis
Revised

To:	Jonah Aiyabei – Permit Services
From:	Adrian Ortiz – Technical Services
Date:	December 31, 2018
Facility Name:	ALIGNED DIGESTER COOPERATIVE LLC
Location:	21463 ROAD 4, CHOWCHILLA
Application #(s):	C-9218-1-0
Project #:	C-1172070

1. Summary

1.1 RMR

Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required	Special Permit Requirements
1-0	0.04	NA[1]	NA[1]	NA[1]	No	Yes
Project Totals	0.04	NA[1]	NA[1]	NA[1]		
Facility Totals	0.04	NA[1]	NA[1]	NA[1]		

Notes:
1. The project passed with a prioritization score that is less than 1; therefore, no further analysis was required.

1.2 AAQA

Pollutant	Air Quality Standard (State/Federal)				
	1 Hour	3 Hours	8 Hours	24 Hours	Annual
CO	NA		NA		
NO_x	NA				Pass
SO_x	NA	NA		NA	Pass
PM10				NA	Pass
PM2.5				NA	Pass

Notes:
1. Results were taken from the attached AAQA Report.
2. The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2) unless otherwise noted below.
3. Modeled PM10 and PM2.5 concentrations were below the District SIL for non-fugitive sources of 5 $\mu g/m^3$ for the 24-hour average concentration and 1 $\mu g/m^3$ for the annual concentration.

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

Unit # 1-0

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.
2. This flare shall be operated only for testing and maintenance, required regulatory purposes, and during emergency situations. Operation of the flare for maintenance, testing, and required regulatory purposes shall not exceed 500 hours per calendar year.

2. Project Description

Technical Services received a request on December 20, 2018 to perform a Revised Risk Management Review (RMR) and Ambient Air Quality Analysis (AAQA) for the following:

- Unit -1-0: DIGESTER GAS PRODUCTION AND STORAGE OPERATION CONSISTING OF ONE COVERED LAGOON ANAEROBIC DIGESTER (460 FT X 360 FT X 24 FT), ONE 44.8 MMBTU/HR BACKUP/EMERGENCY FLARE; AND PERMIT EXEMPT GAS COLLECTION, CONDITIONING, AND STORAGE EQUIPMENT INCLUDING HYDROGEN SULFIDE (H2S) REMOVAL SCRUBBER(S), KNOCKOUT VESSEL(S), COMPRESSOR(S), CHILLER(S), ACTIVATED CARBON ADSORPTION VESSEL(S), CARBON DIOXIDE SEPARATION MEMBRANE UNIT(S), AND STORAGE TANK(S)/PRESSURE VESSEL(S)
- THIS REVISION UPDATES THE RMR REQUEST WITH NEW H2S EMISSIONS AND INCLUDES AN AAQA REQUEST.

3. RMR Report

3.1 Analysis

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

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

Then, generally no further analysis is required.

The District's significant prioritization score threshold is defined as being equal to or greater than1.0. If a preliminary analysis demonstrates that either the unit(s) or the project's or the facility's total prioritization score is greater than the District threshold, a screening or a refined assessment is required

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

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

- Toxic emissions for this proposed unit were calculated using 2001 Ventura County's Air Pollution Control District's emission factors for Natural Gas Fired external combustion and based on the Dairy Biomethane characterization in Pipeline Quality Biomethane: North American Guidance Document for Introduction of Dairy Waste Derived Biomethane Into Existing Natural Gas Networks (2009).

These emissions were input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy, risks from the proposed unit's toxic emissions were prioritized using the procedure in the 2016 CAPCOA Facility Prioritization Guidelines. The prioritization score for this proposed unit was less than 1.0 (see RMR Summary Table).Therefore, no further analysis was necessary.

The following parameters were used for the review:

Source Process Rates						
Unit ID	**Process ID**	**Process Material**	**Process Units**	**Hourly Process Rate**	**Annual Process Rate**	**Receptor Distance (m)**
1	0	Dairy Biogas Rate	MMSCF	0.06	32	600

4. AAQA Report

The District modeled the impact of the proposed project on the National Ambient Air Quality Standard (NAAQS) and/or California Ambient Air Quality Standard (CAAQS) in accordance with District Policy APR-1925 (Policy for District Rule 2201 AAQA Modeling) and EPA's Guideline for Air Quality Modeling (Appendix W of 40 CFR Part 51). The District uses a progressive three level approach to perform AAQAs. The first level (Level 1) uses a very conservative approach. If this analysis indicates a likely exceedance of an AAQS or Significant Impact Level (SIL), the analysis proceeds to the second level (Level 2) which implements a more refined approach. For the 1-hour NO_2 standard, there is also a third level that can be implemented if the Level 2 analysis indicates a likely exceedance of an AAQS or SIL.

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

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

Monitoring Stations				
Pollutant	**Station Name**	**County**	**City**	**Measurement Year**
CO	Madera-Pump Yard	Madera	Madera	2016
NOx	Madera-Pump Yard	Madera	Madera	2016
PM10	28261 Avenue 14 Madera CA 93638	Madera	Madera	2016
PM2.5	28261 Avenue 14 Madera CA 93638	Madera	Madera	2016
SOx	Fresno - Garland	Fresno	Fresno	2016

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

Emission Rates (lbs/year)						
Unit ID	**Process**	**NOx**	**SOx**	**CO**	**PM10**	**PM2.5**
1	1	1,344	21,600	18,046	179	179

The AERMOD model was used to determine if emissions from the project would cause or contribute to an exceedance of any state of federal air quality standard. The parameters outlined below and meteorological data for 09-11 from Madera (rural dispersion coefficient selected) were used for the analysis:

The following parameters were used for the review:

Point Source Parameters						
Unit ID	**Unit Description**	**Release Height (m)**	**Temp. (°K)**	**Exit Velocity (m/sec)**	**Stack Diameter (m)**	**Vertical/ Horizontal/ Capped**
1	Emergency Flare	5.09	394	8.25	1.21	Vertical

5. Conclusion

5.1 RMR

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

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

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

5.2 AAQA

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

6. Attachments

A. Modeling request from the project engineer

B. Additional information from the applicant/project engineer

C. Prioritization score w/ toxic emissions summary

D. Facility Summary

E. AAQA results

APPENDIX E

QNEC

Quarterly Net Emissions Change (QNEC)

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

QNEC = PE2 - PE1, where:

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

The quarterly PE2 and quarterly PE1 can be calculated as follows:

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

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

Using the values in Sections VII.C.2 and VII.C.1 in the evaluation above, the QNEC calculations are summarized in the following tables:

QNEC Summary			
Pollutant	**PE2 (lb/qtr)**	**PE1 (lb/qtr)**	**QNEC (lb/qtr)**
NO_X	336.0	0	336.0
SO_X	5,400.0	0	5,400.0
PM_{10}	44.75	0	44.75
CO	257.5	0	257.5
VOC	33.5	0	33.5