

FINAL

RESPONSES TO FDEP REQUEST FOR ADDITIONAL INFORMATION (RAI) OF SEPTEMBER 10, 2014.

SWWRF – Biosolids Improvement
Project

B&V PROJECT NO. 179508

PREPARED FOR



City of St. Petersburg

17 OCTOBER 2014

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RAI 1

RAI COMMENT 1

Please provide the UTM coordinates for the project (the project location coordinates). These are given as: Zone XX, XXX kilometers (km) East, and XXXX km North.

RAI RESPONSE 1

The UTM coordinates of the proposed BIP are:

Zone 17, 333.77606 km East, and 3067.2037 km North.

RAI 2

RAI COMMENT 2

Title V Major Source Applicability: In determining if the facility is a Title V major source, the application does not include all of the proposed emission units at the facility as well as the facility-wide hazardous air pollutants (HAP) emissions. Please identify each regulated pollutant which the applicant knows or has reason to believe the facility emits or has the potential to emit above a de minimis level. Please include any existing equipment, flares and/or activities that produce air emissions. Identify if any existing equipment will be removed or replaced. According to the domestic wastewater facility permit (FLA 128848) backup power is provided by four, on-site standby diesel power generators. Please identify all engines and fire pumps at the facility.

RAI RESPONSE 2

The following sources are *currently* located at the SWWRF;

- The existing headworks odor control system
 - Serves the headworks and influent pump station. This source was discussed in the responses to the FDEP RAI of June 5, 2014.
- The odor control system serving the gravity belt thickener building
 - A small wet scrubber system with a single blower (10 hp/4500 cfm). This odor control system will be replaced as part of the BIP by scrubbers 1 and 2, which were discussed in the original air construction permit application and the responses to the FDEP RAI of June 5, 2014.
- Digester gas flare;
 - A flare configured to combust digester gas from all three of the existing digesters at the SWWRF. Each of the existing digesters is in disrepair and is not in service. Therefore, the existing flare is not in use. Because the digesters are not operable, the City is currently using a biosolids processing contractor and will continue to do so until the BIP has been completed. Once the BIP is completed and its components are operational, excess digester gas from the newly constructed digesters will be flared using newly constructed flares 1 and 2 which were discussed in the original air construction permit application. The existing digester gas flare will never return to service and will be permanently retired upon completion of the BIP.
- Four existing diesel-fired emergency engine generators:
 - One 500 kW diesel-fired emergency RICE currently serving the administration building. This generator will be retired upon completion of the BIP.
 - One 500 kW diesel-fired emergency RICE currently serving the chlorine contact area and filter backwash pumps. This generator will be retired upon completion of the BIP.
 - One 750 kW diesel-fired emergency RICE currently serving the effluent/RCW pumps. This generator will be retired upon completion of the BIP.

- One 2,000 kW diesel-fired emergency RICE currently serving the balance of the facility. As discussed in the original air construction permit application, this emergency generator is included in the BIP and will be relocated and kept in service.

Otherwise, there is not any additional equipment currently installed at the SWWRF that emits or has the potential to emit above a de minimis level.

In summary, of the existing emissions sources currently installed at the SWWRF listed above, only the headworks odor control system and the 2,000 kW relocated diesel-fired backup generator will remain in service following the BIP. This existing equipment, coupled with the proposed sources discussed in the original air construction permit application and the responses to the FDEP RAI of June 5, 2014, will leave the following air emissions sources operating at the SWWRF following the completion of the BIP:

- Existing Sources;
 - 2,000 kW emergency diesel generator
 - Headworks odor control system
- Proposed Sources
 - Flares 1-4
 - Proposed odor control systems (Scrubbers 1-3)
 - 1,100 kW gas engine generators
 - Primary heating water system boilers
 - 1,750 kW emergency diesel generator
 - Cooling tower

The detailed emissions calculations used in the revised Title V applicability determination that was included in the responses to the FDEP RAI of June 5, 2014 and in Attachment A to this document include the potential to emit for all of these sources (i.e., all operable emissions sources at the SWWRF following completion of the BIP) for each applicable pollutant. Therefore, the aforementioned Title V applicability determination is complete and demonstrates that the facility will not be a Title V Major Source following the completion of the proposed Project.

RAI 3

RAI COMMENT 3

Digester Gas Cleanup Process: Based on the application, this project will clean the digester gas to meet natural gas standards. Please provide a detailed description of the digester gas cleaning process, including:

- a. *What contaminants are in the digester gas after it is released from the anaerobic digesters and how the digester gas cleaning process removes these contaminants.*
- b. *Descriptions of the equipment used in the digester gas cleanup system (Biogas Upgrade System), the control efficiencies of the equipment used and any other supporting information including vendor guarantees.*

RAI RESPONSE 3

As detailed in the responses to the FDEP RAI of June 5, 2014¹, the BUS system will be designed to clean raw digester gas from the proposed anaerobic digesters containing the contaminants listed in Table 1.

Table 1 Raw Digester Gas Characteristics

DIGESTER GAS CHARACTERISTICS	APPROXIMATE VALUE OR RANGE
Methane, percent by volume (dry)	60-65
Carbon dioxide, percent by volume (dry)	35-40
Nitrogen, percent by volume (dry)	0 to 0.5
Oxygen, ppm _v	0 to 50
Hydrogen Sulfide, ppm _v	100 to 3,000
Total siloxanes, ppm _v	0 to 5
Ammonia, ppm _v	0 to 100
Other volatile organic compounds, ppm _v	0 to 100

Typically, concentrations of HCl, formaldehyde, metals, chlorine, and fluorine in raw digester gas are either at non-detect levels or nil. Additionally, sulfur compounds, aside from H₂S, are typically insignificant.

Digester Gas Pretreatment

The gas cleaning process begins with raw digester gas being saturated with liquid water emanating from an upstream condensing process. Prior to entering the BUS, moisture is removed from the digester gas utilizing an in-line type gas separator with filter elements and a mist eliminator. The

¹ RAI Response 4, Table 3. Responses to FDEP Request for Additional Information (RAI) of June 5, 2014.

gas separator will be specified to require the removal of moisture and 98 percent of all solid particles five microns and larger.

Once moisture is removed, the dehydrated gas is precooled in order to promote energy efficiency in the downstream compression process.

BUS Process

Following the precooling process, the gas will enter the BUS where other unwanted constituents will be removed. The BUS system will be manufactured by Guild Associates, Inc. and will utilize a Vacuum Pressure Swing Adsorption (PSA) process. The sub-processes that constitute the BUS process are detailed below.

Upon entering the BUS, the gas will be compressed to a pressure of approximately 100 psi. The compressed gas will be fed to one of three PSA vessels. The PSA vessels are cylindrical, steel, vertically oriented pressure vessels filled with a solid adsorbent. The high pressure gas migrates through the PSA vessel from bottom to top. Under high pressure, the unwanted gases (i.e., CO₂, H₂S, siloxanes, nitrogen, VOCs, and any remaining water vapor) tend to be attracted to solid surfaces, or “adsorbed”. PSA processes can be used to separate gases in a mixture because different gases tend to be attracted to different solid surfaces more or less strongly depending on the size of the gas molecules. The Guild Associates, Inc. PSA systems for biogas upgrading utilize a proprietary adsorbent material called Molecular Gate® which has been specifically engineered with characteristics, including pore size, to restrict the adsorption of relatively large methane molecules while allowing the adsorption of unwanted constituents that have a smaller molecular size.

Having passed through the PSA vessel, the cleaned methane gas exits the top end of the PSA vessel where it is conveyed to the gas chromatograph analyzer to ensure that it meets quality specifications and then to final compression. After final compression, the BUS product gas is used as vehicle fuel in the City’s sanitation fleet or, secondarily, as fuel for the on-site gas engine generators and the primary heating water system boilers.

The Molecular Gate® adsorbent has a limited capacity to adsorb the undesirable gas molecules before it becomes saturated. Once a particular PSA vessel becomes saturated, the gas molecules must be desorbed from the adsorbent. This is accomplished by utilizing a vacuum pump to depressurize the PSA vessel to such a degree that the gas molecules of the unwanted constituents are released from the adsorbent and collected. This gas stream is referred to as the “tail gas” and is conveyed to the thermal oxidizer (Flare 3) where it is oxidized.

In order to allow uninterrupted operation of the BUS while a PSA vessel is desorbed, the gas cleaning operation is rotated between the three PSA vessels.

As detailed in the responses to the FDEP RAI of June 5, 2014, the BUS will clean the gas to the specification listed in Table 2. The BUS is designed to remove 99 percent of H₂S and 99+ percent of siloxanes and VOCs relative to the raw digester gas.

Table 2 BUS Product Gas Characteristics²

DIGESTER GAS CHARACTERISTICS	APPROXIMATE VALUE OR RANGE
Higher heating value, Btu/scf, min	990
Methane, percent by volume (dry)	98
Carbon dioxide, percent by volume (dry)	2
Oxygen percent by volume, max	0.1
Hydrogen Sulfide, ppm _v , max	1
Sum of CO ₂ , Nitrogen, and Oxygen (percent by volume – max)	2
Total siloxanes, ppb _v , max	Non-detectable
Total ammonia, ppb _v , max	Non-detectable
Other volatile organic compounds, ppb _v , max	Non-detectable

RAI 4

RAI COMMENT 4

Emission Factors: New Source Performance Standards (NSPS) Subpart JJJJ of 40 CFR 60 (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines) provides emission factors for the two 1,517 brake-horse power (bhp) Cummins engines when firing digester gas. However, when determining the potential to emit emissions for the criteria pollutants and HAP in the application, the emission factors for firing only natural gas were used. Please provide the manufacturer's guarantee that the natural gas emission factors are representative when firing cleaned digester gas. In addition, please provide the manufacturer's guarantee that these engines will not lose their natural gas certification when firing cleaned digester gas.

RAI RESPONSE 4

A vendor has not yet been selected to provide the two 1,517 bhp engine generators. Additionally, the engine performance and emissions are ultimately dependent on fuel gas produced by a system not yet constructed. For these reasons, obtaining the guarantees requested by FDEP in RAI Comment 4 would likely be difficult and time-consuming. Additionally, the gas engine generators will be installed and operating for a period of 2-3 years prior to the BUS gas being available for the engines. During this period, the gas engine generators will be fired exclusively on utility-provided natural gas. In order to address FDEP's concerns while expediting the permitting process, the City is proposing the following permit condition be incorporated into the BIP air construction permit:

- I. Proposed Permit Condition for BIP gas-fired engine generators.
 - a. The natural gas/BUS product gas-fired engine generators' emissions of NO_x, CO, and VOCs, shall not exceed the following limits on a per-unit basis when firing utility-provided natural gas or BUS product gas:
 - i. NO_x – 1.0 g/bhp-hr
 - ii. CO - 2.0 g/bhp-hr
 - iii. VOC - 0.7 g/bhp-hr

Compliance with this condition and with NESHAPS ZZZZ/NSPS JJJJ shall be demonstrated by either:

- b. Purchasing an engine certified by the manufacturer to meet the applicable emission limits provided in Table 1 to NSPS JJJJ for a non-emergency SI natural gas engine ≥500 hp manufactured on or after 7/1/2010 (i.e., NO_x - 1.0 g/bhp-hr, CO - 2.0 g/bhp-hr, VOC - 0.7 g/bhp-hr) **whether firing utility-provided natural gas or BUS product gas.**

OR

- c.
 - i. Purchase an engine certified by the manufacturer to meet the applicable emission limits provided in Table 1 to NSPS JJJJ for a non-emergency SI

natural gas engine \geq 500 hp manufactured on or after 7/1/2010 (i.e., NO_x - 1.0 g/bhp-hr, CO - 2.0 g/bhp-hr, VOC - 0.7 g/bhp-hr) in order to demonstrate compliance with the regulation until BUS product gas is available to be fired in the engines.

AND

- ii. Enter into a contractual agreement with the engine manufacturer that once BUS product gas is available and the engines are tested while firing BUS product gas to confirm their ability to meet the emission limits provided in Table 1 to NSPS JJJJ for a non-emergency SI natural gas engine \geq 500 hp manufactured on or after 7/1/2010 (i.e., NO_x - 1.0 g/bhp-hr, CO - 2.0 g/bhp-hr, VOC - 0.7 g/bhp-hr), the manufacturer will certify that the engines will meet the emission limits provided in Table 1 to NSPS JJJJ for a non-emergency SI natural gas engine \geq 500 hp manufactured on or after 7/1/2010 (i.e., NO_x - 1.0 g/bhp-hr, CO - 2.0 g/bhp-hr, VOC - 0.7 g/bhp-hr) while firing BUS product gas (40 CFR §60.4241(f)). The owner/operator will provide notification to FDEP upon startup of the BUS.

IF the engines are not able to be certified per I(c)(ii) above when firing BUS product gas, THEN;

- d. The owner/operator shall comply with the applicable requirements of NSPS JJJJ for a non-emergency, non-certified, new SI engine generator firing landfill/digester gas, while concurrently complying with the emission limits proposed in I(a) above.

Permitting Note:

In the event that the engines are not certified when firing BUS product gas, the owner/operator will concurrently utilize the stack test(s) required by NSPS JJJJ to demonstrate compliance with the emission limits proposed in I(a) of this condition.

The permit condition outlined above places the onus on the owner/operator to operate the gas-fired engine generators within the proposed permit limits (i.e., emission factors used in the application for NSR/PSD and Title V Major Source Applicability) and at the same time ensures compliance with NESHAPS Subpart ZZZZ and NSPS Subpart JJJJ regardless of whether the engine is ultimately applicable as a natural gas engine or a landfill/digester gas engine. Additionally, the proposed permit condition allows the owner/operator to maintain the desired operational flexibility while remaining a true minor source.

Application Revisions

The emissions calculations associated with the SWWRF BIP air construction permit application have been revised to incorporate the emission limits for the gas-fired engine generators proposed in the permit condition outlined above. The revised emissions calculations have been included as Attachment A to this document. The revised NSR/PSD and Title V Major Source applicability determinations are detailed in Tables 3 and 4, respectively. Lastly, the appropriate FDEP forms have been revised to include the updated emission factors and PTEs. A complete set of forms including the revisions is provided in Attachment B.

Table 3 PSD Applicability Determination

POLLUTANT	PTE (TPY)^[1]	TITLE V MAJOR SOURCE THRESHOLD (TPY)	EQUALS OR EXCEEDS MAJOR SOURCE THRESHOLD (YES/NO)
NO _x	38.6	250	NO
CO	66.7	250	NO
VOC	22.0	250	NO
SO ₂	40.0	250	NO
PM _(filterable)	1.42	250	NO
PM _{10 (filterable+condensable)}	2.57	250	NO
PM _{2.5 (filterable+condensable)}	2.53	250	NO
Lead	2.74E -05	250	NO
H ₂ SO ₄	0.128	250	NO
H ₂ S	1.53	250	NO
CO ₂	19,203	--	--
CH ₄	106	--	--
N ₂ O	0.121	--	--
GHG – Mass Basis	19,310	--	--
GHG – CO ₂ e Basis	21,899	100,000	NO
Notes [] :			
1. See Attachment A for Detailed Emissions Calculations.			

Table 4 BIP Title V Major Source Applicability Determination

POLLUTANT	PTE (TPY)	TITLE V MAJOR SOURCE THRESHOLD (TPY)	EQUALS OR EXCEEDS MAJOR SOURCE THRESHOLD (YES/NO)
NO _x	40.2	100	NO
CO	66.8	100	NO
VOC	22.0	100	NO
SO ₂	40.0	100	NO
PM _(filterable)	1.43	100	NO
PM _{10 (filterable+condensable)}	2.58	100	NO
PM _{2.5 (filterable+condensable)}	2.54	100	NO
Lead	2.74E -05	5	NO
H ₂ SO ₄	0.130	100	NO
H ₂ S	2.72	100	NO
CO ₂	19,359	--	--
CH ₄	106	--	--
N ₂ O	0.121	--	--
GHG – Mass Basis	19,465	100	YES ^[1]
GHG – CO ₂ e Basis ^[2]	22,054	100,000	NO
Maximum Individual HAP - Formaldehyde	4.45	10	NO
Cumulative HAPs	6.18	25	NO

Notes []:

1. According to USEPA guidance, after July 1, 2011, existing and newly constructed facilities must have GHG PTEs that equal or exceed 100 tpy on a mass basis and 100,000 tpy on a CO₂e basis in order to be considered a Title V Major Source.
2. CO₂ equivalents (CO₂e) based on the latest global warming potential for applicable pollutants as listed in Table A-1 to Subpart A of 40 CFR Part 98 – Global Warming Potentials.

Attachment A – Revised Emissions Calculations

PSD Applicability Determination ⁽¹⁾			
Projected Annual Emissions (tpy) of PSD Pollutants from BIP Project			
	BIP PTE	Major Source Threshold (tpy)	Equals/Exceeds Major Source Threshold? (Yes/No)
NO _x	38.6	250	No
CO	66.7	250	No
VOC	22.0	250	No
SO ₂	40.0	250	No
PM ₁₀ (⁽⁴⁾ filterable)	1.42	250	No
PM _{2.5} (⁽⁴⁾ filterable/condensable)	2.57	250	No
PM _{2.5} (⁽⁴⁾ filterable/condensable)	2.53	250	No
Lead	2.74E-05	250	No
H ₂ SO ₄	0.128	250	No
H ₂ S	1.53	250	No
CO ₂	19,203	--	--
CH ₄	106	--	--
N ₂ O	1.21E-01	--	--
GHG - Mass Basis	19,310	--	--
GHG - CO ₂ e Basis	21,899	100,000	No

62-210.300, FAC Exemption Applicability Determination						
Exemption for Natural Gas Boilers (62-210.300(3)(a)(34), FAC)					Exemption for Natural Diesel Generators (62-210.300(3)(a)(35), FAC)	
Per Unit Threshold for Exemption (mmscf/yr)	Per Unit Projected Fuel Use	Combined Fuel Use Threshold for Exemption (tpy)	Combined Projected Fuel Use from Both Units	Qualifies for Exemption?	Combined Fuel Use Threshold for Exemption (gallons/year)	Combined Projected Fuel Use from Both Units
150	55	375	110	Yes	64,000	26,400
Generic Exemption Applicability for Flares, Carbon Scrubbers, & Cooling Tower (62-210.300(3)(b)(1)(c), FAC)						
Threshold	HAPs			Other ⁽¹⁾		
	Lead	Individual	Total	5.0 tpy	Exemption Applied? (Yes/No)	
	500 lb/yr	1,000 lb/yr	2,500 lb/yr			
Flare 1	NA			2.29	Yes	
Flare 2				0.87	Yes	
Flare 3				36.79	No	
Flare 4				4.24E-02	Yes	
Scrubbers				1.53	Yes	
Cooling Tower		0.11	Yes			
Generic Exemption Applicability for Flares, Carbon Scrubbers, & Cooling Tower (62-210.300(3)(b)(1)(b), FAC)						
	Facility PTE	Title V Threshold (tpy)	Equals/Exceeds Threshold? (Yes/No)			
NO _x	40.2	100	No			
CO	66.8	100	No			
VOC	22.0	100	No			
SO ₂	40.0	100	No			
PM ₁₀ (⁽⁴⁾ filterable)	1.4	100	No			
PM _{2.5} (⁽⁴⁾ filterable/condensable)	2.58	100	No			
PM _{2.5} (⁽⁴⁾ filterable/condensable)	2.54	100	No			
Lead	2.74E-05	100	No			
H ₂ SO ₄	0.130	100	No			
H ₂ S	1.53	100	No			
CO ₂	19,359	--	--			
CH ₄	106	--	--			
N ₂ O	1.21E-01	--	--			
GHG - Mass Basis	19,465	--	--			
GHG - CO ₂ e Basis	22,054	100,000	No			
Projected Annual Emissions (tpy) of Individual HAPs from Entire Project						
	PTE	Major Source Threshold (tpy)	Equals/Exceeds Major Source Threshold? (Yes/No)			
1,1,2,2-Tetrachloroethane	3.36E-03	10	No			
1,1,2-Trichloroethane	2.67E-03	10	No			
1,3-Butadiene	2.35E-02	10	No			
1,3-Dichloropropene	2.22E-03	10	No			
2,2,4-Trimethylpentane	2.10E-02	10	No			
Acetaldehyde	7.03E-01	10	No			
Acrolein	4.32E-01	10	No			
Benzene	3.85E-02	10	No			
Biphenyl	1.78E-02	10	No			
Carbon Tetrachloride	3.09E-03	10	No			
Chlorobenzene	2.56E-03	10	No			
Chloroform	2.40E-03	10	No			
Dichlorobenzene	6.58E-05	10	No			
Ethylene Dibromide	3.73E-03	10	No			
Formaldehyde	4.45E+00	10	No			
Methanol	2.10E-01	10	No			
Methylene Chloride	1.68E-03	10	No			
Naphthalene	6.53E-03	10	No			
Hexane	1.92E-01	10	No			
Phenol	2.02E-03	10	No			
Styrene	1.98E-03	10	No			
Tetrachloroethylene	2.09E-04	10	No			
Toluene	3.50E-02	10	No			
Vinyl Chloride	1.25E-03	10	No			
Xylene	1.58E-02	10	No			
Polycyclic Organic Matter ⁽²⁾	8.79E-03	10	No			
Lead	2.74E-05	10	No			
Arsenic	1.89E-05	10	No			
Beryllium	5.31E-06	10	No			
Cadmium	7.99E-05	10	No			
Chromium	1.65E-04	10	No			
Cobalt	4.61E-06	10	No			
Manganese	4.04E-05	10	No			
Mercury	5.15E-05	10	No			
Nickel	4.30E-04	10	No			
Selenium	1.32E-06	10	No			
Total HAPs Project PTE (tpy)	6.18E+00	25	No			

Notes []:

- 62-210.300(3)(b)(1)(c), FAC specifies that the unit must not have the potential to emit 5.0 tpy of any regulated pollutant (other than HAPs and Lead) as defined by 62-210.200, FAC. For the BIP Project flares and cooling tower, these "other" pollutants include NO_x, VOC, SO₂, PM₁₀, PM_{2.5}, and PM, PM₁₀ and PM_{2.5}, respectively. Only the maximum amount emitted is shown here. Please see "Flares", "Carbon Scrubber Emissions", and "Cooling Tower" for individual pollutant emissions.
- Polycyclic Organic Matter includes Polycyclic Aromatic Hydrocarbons (PAH) emissions from the relocated diesel generator.
- The 1,750 kW diesel generator is being relocated from the Albert Whitted facility to the SWWRF. Therefore, it is considered a new emissions source and is included as a component of the BIP Project and its PTE is included in the PSD major source applicability determination. The 2,000 kW generator is currently located at the SWWRF. Therefore, the 2,000 kW emissions are not included in the PSD major source applicability determination and it is only shown in this appendix in order to determine Title V Major Source applicability and the applicability of exemptions pursuant to 62-210.300, FAC.
- USEPA issued a final rule (Reference 2) which removed a requirement in the definition of "regulated NSR pollutant" to include condensable PM when measuring one of the emissions-related indicators for particulate pollutant" to include condensable PM when measuring one of the emissions-related indicators for particulate matter known as "particulate matter emissions" in the context of the PSD and NSR regulations; therefore, only the filterable portion is regulated with regards to PM emissions.
- According to USEPA guidance after July 1, 2011 existing and newly constructed facilities must have GHG PTEs that equal or exceed 100 tpy on a mass basis and 100,000 tpy on a CO₂e basis.

**St. Petersburg - SW WRF
Biosolids Improvement Project (BIP)**

Potential to Emit - Gas - Fired Engine Generators

Cummins Model C1100 N6C	
No. of Engines	2
Engine Output	1517 hp ^[1]
Heat Input (HHV)	9.60 MBtu/hr ^[1,6]
Exhaust Gas Flow @100% Load	6650 acfm ^[1]
Annual Hours of Operation	8760 hrs
Exhaust Gas Temperature	757 °F ^[1]
Maximum H2S Content of BUS Product Gas	1 ppmvd
SO ₂ to SO ₃ Conversion Rate (assumed)	100 %
Molecular Weight of SO ₂	64 lb/lb-mol
Molecular Weight of H ₂ SO ₄	98 lb/lb-mol
Emission Factors PSD Pollutants	
NO _x	1.0 g/hp-hr ^[10]
NMHC (VOCs)	0.7 g/hp-hr ^[10]
PM _{10(Filterable)}	0.03 g/hp-hr ^[1,2]
PM _{2.5(Filterable)}	0.03 g/hp-hr ^[1,2]
PM _(Filterable)	0.03 g/hp-hr ^[1,2]
PM _(Condensable)	9.91E-03 lb/MBtu ^[4]
SO ₂	5.88E-04 lb/MBtu ^[4]
CO	2.0 g/hp-hr ^[10]
CO ₂	6.4 % (dry) ^[1,3]
	64000 ppmvd
CH ₄	1.25 lb/MBtu ^[4]
Annual Emissions of PSD Pollutants with Both Engines Operating	
NO _x	29.3 tpy
NMHC (VOCs)	20.5 tpy
PM _{10(Filterable+Condensable)}	1.71 tpy ^[5]
PM _{2.5(Filterable+Condensable)}	1.71 tpy ^[5]
PM _(Filterable)	0.879 tpy ^[5,7]
SO ₂	0.049 tpy
H ₂ SO ₄ ^[9]	0.076 tpy
CO	58.6 tpy
CO ₂	11079 tpy
CH ₄	105.1 tpy
CO _{2e} ^[8]	13707 tpy

Hazardous Air Pollutants (HAPS)	Emission Factors (lb/MBtu) ^[4]	Emission Rate (lb/hr) (per unit)	PTE (tpy) (Both Engines Operating)
1,1,2,2 Tetrachloroethane	4.00E-05	3.84E-04	3.36E-03
1,1,2 Trichloroethane	3.18E-05	3.05E-04	2.67E-03
1,3 Butadiene	2.67E-04	2.56E-03	2.25E-02
1,3 Dichloropropene	2.64E-05	2.53E-04	2.22E-03
2,2,4 Trimethylpentane	2.50E-04	2.40E-03	2.10E-02
Acetaldehyde	8.36E-03	8.03E-02	7.03E-01
Acrolein	5.14E-03	4.94E-02	4.32E-01
Benzene	4.40E-04	4.22E-03	3.70E-02
Biphenyl	2.12E-04	2.04E-03	1.78E-02
Carbon Tetrachloride	3.67E-05	3.52E-04	3.09E-03
Chlorobenzene	3.04E-05	2.92E-04	2.56E-03
Chloroform	2.85E-05	2.74E-04	2.40E-03
Ethylene Dibromide	4.43E-05	4.25E-04	3.73E-03
Formaldehyde	5.28E-02	5.07E-01	4.44E+00
Methanol	2.50E-03	2.40E-02	2.10E-01
Methylene Chloride	2.00E-05	1.92E-04	1.68E-03
Napthalene	7.44E-05	7.14E-04	6.26E-03
Hexane	1.11E-03	1.07E-02	9.34E-02
Phenol	2.40E-05	2.30E-04	2.02E-03
Styrene	2.36E-05	2.27E-04	1.98E-03
Tetrachloroethylene	2.48E-06	2.38E-05	2.09E-04
Toluene	4.08E-04	3.92E-03	3.43E-02
Vinyl Chloride	1.49E-05	1.43E-04	1.25E-03
Xylene	1.84E-04	1.77E-03	1.55E-02
Polycyclic Organic Matter	--	9.59E-04	8.40E-03
2-Methylnaphthalene	3.32E-05	3.19E-04	--
Acenaphthene	1.25E-06	1.20E-05	--
Acenaphthylene	5.53E-06	5.31E-05	--
Benzo(b)fluoranthene	1.66E-07	1.59E-06	--
Benzo(g,h,i)perylene	4.14E-07	3.98E-06	--
Benzo(e)pyrene	4.15E-07	3.98E-06	--
Chrysene	6.93E-07	6.65E-06	--
Ethylbenzene	3.97E-05	3.81E-04	--
Fluoranthene	1.11E-06	1.07E-05	--
Fluorene	5.67E-06	5.44E-05	--
Phenanthrene	1.04E-05	9.99E-05	--
Pyrene	1.36E-06	1.31E-05	--
Total HAPs			6.07E+00

Notes []:

1. Based on preliminary vendor data.
2. Emissions assuming 5% O₂ concentration in exhaust gas.
3. Preliminary vendor data contains CO₂ exhaust percentage by volume on a dry basis. The value is conservatively assumed to be on an actual basis in this Appendix.
4. Emission factor obtained from AP-42 (Reference 1a).
5. Assumes all PM is less than 2.5 microns.
6. Based on ratio of average heat content of natural gas at LHV & HHV. HHV=LHV*1.11
7. USEPA issued a final rule (Reference 2) which removed a requirement in the definition of "regulated NSR pollutant" to include condensable PM when measuring one of the emissions-related indicators for particulate matter known as "particulate matter emissions" in the context of the PSD and NSR regulations; therefore, only the filterable portion is regulated with regards to PM emissions.
8. CO₂ equivalents (CO_{2e}) based on the global warming potential for applicable pollutant as listed in Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials.
9. Assumes 100% (by volume) of SO₂ oxidized to form SO₃.
10. Proposed emission limit.

References:

1. USEPA, AP-42, Fifth Edition, Vol. I. Chapter 3 "Stationary Internal Combustion Sources", Section 3.2 "Natural Gas-Fired Reciprocating Engines". April 2000.
 - a. Table 3.2-2 "Uncontrolled Emission Factors For 4-Stroke Lean-Burn Engines."
2. "Implementation of the New Source Review (NSR) Program for Particulate Matter Less Than 2.5 Micrometers (PM_{2.5}): Amendment to the Definition of "Regulated NSR Pollutant" Concerning Condensable Particulate Matter", 77 Federal Register 207 (25 October 2012), pp. 65107 - 65119.

St. Petersburg - SW WRF
Biosolids Improvement Project (BIP)

Potential to Emit - Flares

Flare	Maximum Output (scfm) ^[1]
Flare 1 - Enclosed Flare to Combust Excess Gas from Digesters 1 & 2	760 scfm
Flare 2 - Candlestick Flare to Combust Excess Gas from Digester 3 (16-inch pressure zone)	600 scfm
Flare 3 - Thermal Oxidizer to Combust Waste Gas From BUS	140 scfm
Flare 4 - Candlestick Startup Flare Combusting BUS Product Gas	200 scfm

Emissions Factors	Flare 1 ^[1]	Flare 3 ^[1]	Flares 2 & 4 ^[2]
NO _x (lb/MBtu)	0.06	0.06	0.068
CO (lb/MBtu)	0.15	0.30	0.37
VOC (lb/MBtu)	0.08	0.08	0.14
PM (lb/mmscf) ^[3]	60	--	--
PM ₁₀ (lb/mmscf) ^[3]	60	--	--
PM _{2.5} (lb/mmscf) ^[3]	60	--	--
CO ₂ (lb/MBtu) ^[4]	117	117	117
CH ₄ (lb/MBtu) ^[5]	0.08	0.08	0.08
N ₂ O (lb/MBtu) ^[4]	2.20E-04	2.20E-04	2.20E-04

Add N₂O Emissions Part 98 Table C-1

H ₂ S Concentration in Digester Gas Upstream of Biogas Upgrade System (BUS)	3,000 ppmv ^[6]
H ₂ S Concentration in BUS Product Gas	50 ppmv ^[1]
Heat Content of Digester Gas Upstream of Biogas Upgrade System (BUS)	645 Btu/scf ^[6]
Heat Content of BUS Waste Gas	186 Btu/scf ^[1]
Heat Content of BUS Product Gas	990 Btu/scf ^[1]
Heat Content of Pilot Fuel Gas	1020 Btu/scf ^[9]
Temperature of Digester Gas	83 °F ^[1]
Temperature of BUS Product Gas	100 °F ^[1]
Molecular Weight of SO ₂	64 lb/lb-mol
Flare 1 Gas Throughput	9435039 scf/yr ^[6]
Flare 1 Pilot Gas Throughput	438000 scf/yr ^[6]
Flare 2 Gas Throughput	3570459 scf/yr ^[6]
Flare 2 Pilot Gas Throughput	438000 scf/yr ^[6]
Flare 3 Gas Throughput	73584000 scf/yr ^[6]
Flare 3 Pilot Gas Throughput	876000 scf/yr ^[6]
Flare 4 Gas Throughput	6088 scf/yr ^[6]
Flare 4 Pilot Gas Throughput	219000 scf/yr ^[6]

Annual Emissions (tpy) of PSD Pollutants from Flaring of Gas				
	Flare 1	Flare 2	Flare 3	Flare 4
NO _x	0.18	0.08	0.41	2.05E-04
CO	0.46	0.43	2.05	1.12E-03
VOC	0.24	0.16	0.55	4.22E-04
SO ₂	2.29	0.87	36.79	2.38E-05
PM ^[3]	0.28	--	--	--
PM ₁₀ ^[3]	0.28	--	--	--
PM _{2.5} ^[3]	0.28	--	--	--
CO ₂	356	135	801	3.53E-01
CH ₄	0.23	0.089	0.527	2.32E-04
N ₂ O	6.69E-04	2.53E-04	1.51E-03	6.63E-07
CO _{2e} ^[8]	362	137	814	3.59E-01

Annual Emissions (tpy) of PSD Pollutants from Flare Pilots ^[2]				
	Flare 1	Flare 2	Flare 3	Flare 4
NO _x	0.015	0.015	0.030	7.59E-03
CO	0.083	0.083	0.17	4.13E-02
VOC	0.031	0.031	0.063	1.56E-02
SO ₂ ^[7]	3.13E-04	3.13E-04	6.26E-04	1.56E-04
CO ₂ ^[4]	26.1	26.1	52.3	13.1
CH ₄	0.017	0.017	0.034	8.35E-03
N ₂ O	4.91E-05	4.91E-05	9.83E-05	2.38E-05
CO _{2e} ^[8]	27	27	53	13.3

Total Annual Emissions (tpy) of PSD Pollutants from Flaring of Gas & Pilot Emissions				
	Flare 1	Flare 2	Flare 3	Flare 4
NO _x	0.20	0.09	0.44	7.80E-03
CO	0.54	0.51	2.22	4.24E-02
VOC	0.27	0.19	0.61	1.61E-02
SO ₂ ^[7]	2.29	0.87	36.79	1.80E-04
PM ^[3]	0.28	--	--	--
PM ₁₀ ^[3]	0.28	--	--	--
PM _{2.5} ^[3]	0.28	--	--	--
CO ₂ ^[4]	382	161	853	13.4
CH ₄	0.25	0.106	0.561	8.58E-03
N ₂ O	7.19E-04	3.02E-04	1.60E-03	2.45E-05
CO _{2e} ^[8]	389	164	867	13.6

Notes []:

- Information obtained from Brown & Caldwell 30% Preliminary Design Report (PDR) and Technical Specifications - Volume No. 2, 60% Submittal.
- Emission factor obtained from AP-42 (Reference 1a).
- Assumed to be both filterable and condensable & less than 2.5 microns.
- CO₂ emission factor obtained from Table C-1 to Subpart C of 40 CFR Part 98. Conservatively used emission factor for natural gas for each flare as the value is greater than the emission factor for combusted biogas.
- Emission factor obtained from AP-42 (Reference 1b). Methane emissions are assumed to be 55% of total VOC emissions.
- Calculated using information obtained from "Air Permit Info.xlsx" sent to Black & Veatch on 12/6/2013 from Christian Aristizabal of Brown & Caldwell.
- Assumes 1 grain per 100 scf sulfur content in the pilot gas and all sulfur in the fuel is converted to SO₂ during combustion.
- CO₂ equivalents (CO_{2e}) based on the global warming potential for applicable pollutant as listed in Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials.
- Assumed value.

1. References:

- USEPA, AP-42, Fifth Edition, Vol. I. Chapter 13 "Miscellaneous Sources", Section 13.5 "Industrial Flares". April 2000.
 - Table 13.5-1 "Emission Factors for Flare Operations".
 - Table 13.5-2 "Hydrocarbon Composition of Flare Emission".

St. Petersburg - SW WRF
Biosolids Improvement Project (BIP)

Potential to Emit - Backup Heating Boilers for Digesters

Basis:

Number of Units	2
Fuel	Natural Gas
Heat Input	6.38 mmBtu/hr ^[1]
Heating Value of Fuel	990 Btu/scf ^[2]
Fuel Burn Rate	0.0063 mmscf/hr ^[1]
SO ₂ to SO ₃ Conversion Rate	100 % by volume (assumed)

Fuel consumed by each unit operating 8760 hours per year	55 mmscf/yr
Combined fuel consumed by both units operating 8760 hours per year	110 mmscf/yr

Global Warming Potentials^[3]

CO ₂	1
CH ₄	25
N ₂ O	298

Annual Potential Emissions

Pollutant	Mass Emission Rate (Per Unit)			Annual Emissions When Both Units Operating 8760 hrs (tpy)
	(lb/mmscf)	Notes	(lb/hr)	
CO	84	[4]	5.26E-01	4.605
NO _x	100	[6]	6.26E-01	5.48
PM	1.9	[6, 7]	1.19E-02	0.104
PM ₁₀	7.6	[6, 8]	4.76E-02	0.417
PM _{2.5}	7.6	[6, 8]	4.76E-02	0.417
SO ₂	0.60	[9]	3.76E-03	0.0329
VOC	5.5	[6]	3.44E-02	0.302
Lead	0.0005	[6]	3.13E-06	2.74E-05
H ₂ SO ₄	0.92	[10]	5.75E-03	0.0504
CO ₂	120,000	[6]	751.06	6,579.28
CH ₄	2.3	[6]	1.44E-02	1.26E-01
N ₂ O	2.2	[6]	1.38E-02	1.21E-01
GHG-CO ₂ e	--	[11]	--	6,618

CAS Number	Pollutant	Mass Emission Rate (per unit)			PTE (tpy)
		(lb/mmscf)	Notes	(lb/hr)	
71-43-2	Benzene	2.10E-03	[12]	1.31E-05	1.15E-04
25321-22-6	Dichlorobenzene	1.20E-03	[12]	7.51E-06	6.58E-05
50-00-0	Formaldehyde	7.50E-02	[12]	4.69E-04	4.11E-03
110-54-3	Hexane	1.80E+00	[12]	1.13E-02	9.87E-02
91-20-3	Naphthalene	6.10E-04	[12]	3.82E-06	3.34E-05
--	Polycyclic Organic Matter	8.82E-05	[12, 4]	5.52E-07	4.84E-06
91-57-6	2-Methylnaphthalene	2.40E-05	[12, 5]	--	--
56-49-5	3-Methylchloranthrene	1.80E-06	[12, 5]	--	--
57-97-6	7,12-Dimethylbenz(a)anthracene	1.60E-05	[12, 5]	--	--
83-32-9	Acenaphthene	1.80E-06	[12, 5]	--	--
203-96-8	Acenaphthylene	1.80E-06	[12, 5]	--	--
120-12-7	Anthracene	2.40E-06	[12, 5]	--	--
56-55-3	Benzo(a)anthracene	1.80E-06	[12, 5]	--	--
50-32-8	Benzo(a)pyrene	1.20E-06	[12, 5]	--	--
205-99-2	Benzo(b)fluoranthene	1.80E-06	[12, 5]	--	--
191-24-2	Benzo(g,h,i)perylene	1.20E-06	[12, 5]	--	--
205-82-3	Benzo(k)fluoranthene	1.80E-06	[12, 5]	--	--
218-01-9	Chrysene	1.80E-06	[12, 5]	--	--
53-70-3	Dibenzo(a,h)anthracene	1.20E-06	[12, 5]	--	--
206-44-0	Fluoranthene	3.00E-06	[12, 5]	--	--
86-73-7	Fluorene	2.80E-06	[12, 5]	--	--
193-39-5	Indeno(1,2,3-cd)pyrene	1.80E-06	[12, 5]	--	--
85-01-8	Phenanthrene	1.70E-05	[12, 5]	--	--
129-00-0	Pyrene	5.00E-06	[12, 5]	--	--
108-88-3	Toluene	3.40E-03	[12]	2.13E-05	1.86E-04
[6]	Lead	5.00E-04	[13]	3.13E-06	2.74E-05
[6]	Arsenic	2.00E-04	[13]	1.25E-06	1.10E-05
[6]	Beryllium	1.20E-05	[13]	7.51E-08	6.58E-07
[6]	Cadmium	1.10E-03	[13]	6.88E-06	6.03E-05
[6]	Chromium	1.40E-03	[13]	8.76E-06	7.68E-05
[6]	Cobalt	8.40E-05	[13]	5.26E-07	4.61E-06
[6]	Manganese	3.80E-04	[13]	2.38E-06	2.08E-05
[6]	Mercury	2.60E-04	[13]	1.63E-06	1.43E-05
[6]	Nickel	2.10E-03	[13]	1.31E-05	1.15E-04
[6]	Selenium	2.40E-05	[13]	1.50E-07	1.32E-06
Total HAPs					1.04E-01

Notes []:

- Based on preliminary vendor data.
- Based on design data.
- CO₂ equivalents (CO₂e) based on the global warming potential for applicable pollutant as listed in Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials.
- Emission factor obtained from AP-42 (Reference 1a); for a small boiler (<100 mmBtu/hr), uncontrolled.
- Pollutant is assumed to be a POM.
- Emission factor obtained from AP-42 (Reference 1b).
- USEPA issued a final rule (Reference 2) which removed a requirement in the definition of "regulated NSR pollutant" to include condensable PM when measuring one of the emissions-related indicators for particulate matter known as "particulate matter emissions" in the context of the PSD and NSR regulations; therefore, only the filterable portion is regulated with regards to PM emissions.
- Based on information provided in AP-42 (Reference 1), all particulate matter (filterable and condensable) is assumed to be less than 1.0 micrometer in diameter.
- Assumed all sulfur in the fuel is converted to SO₂.
- Assumes 100% (by volume) of SO₂ is oxidized to form SO₃.
- The GHG emissions is the sum of all applicable GHG pollutants.
- Emission factor obtained from AP-42 (Reference 1c).
- Emission factor obtained from AP-42 (Reference 1d).
- Polycyclic Organic Matter (POM) emissions is the summation of individual POM pollutants.

References:

- USEPA, AP-42, Fifth Edition, Vol. I. Chapter 1 "External Combustion Sources", Section 1.4 "Natural Gas Combustion". July 1998.
 - Table 1.4-1 "Emission Factors for Nitrogen Oxides (NO_x) and Carbon Monoxide (CO) from Natural Gas Combustion".
 - Table 1.4-2 "Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion".
 - Table 1.4-3 "Emission Factors for Speciated Organic Compounds from Natural Gas Combustion".
 - Table 1.4-4 "Emission Factors for Metals from Natural Gas Combustion".
- "Implementation of the New Source Review (NSR) Program for Particulate Matter Less Than 2.5 Micrometers (PM_{2.5}): Amendment to the Definition of "Regulated NSR Pollutant" Concerning Condensable Particulate Matter", 77 Federal Register 207 (25 October 2012), pp. 65107 - 65119.

St. Petersburg - SW WRF
Biosolids Improvement Project (BIP)

Potential to Emit - Proposed Odor Control Systems

H₂S Emissions	
H ₂ S Concentration in Foul Air (Primary Clarifiers & Gravity Belt Thickener Building)	10 ppmvd ^[1]
H ₂ S Concentration in Foul Air (Dewatering Building)	45 ppmvd ^[3]
Average Temperature of Foul Air	68 °F ^[1]
Molecular Weight of H ₂ S	34 lb/lb-mol
Assumes Continuous Annual Operation	8760 hours
Control Efficiency (per scrubber) ^[1,2]	95 %
Design Capacity ^[1]	
Scrubber 1 - Primary Clarifiers & Gravity Belt Thickener Building	12000 scfm
Scrubber 2 - Primary Clarifiers & Gravity Belt Thickener Building	12000 scfm
Scrubber 3 - Dewatering Building ^[5]	24000 scfm
H₂S PTE (tons per year)^[4]	
Scrubber 1 - Primary Clarifiers & Gravity Belt Thickener Building	0.139 tpy
Scrubber 2 - Primary Clarifiers & Gravity Belt Thickener Building	0.139 tpy
Scrubber 3 - Dewatering Building ^[5]	1.26 tpy
Total	1.53 tpy

Notes: []:

- Information obtained from Brown & Caldwell 30% Preliminary Design Report (PDR) and Technical Specifications - Volume No. 3, 60% Submittal. Value is downstream of Biotrickling Filters at inlet of carbon scrubbers.
- Specifications are for 99% control efficiency. 95% conservatively assumed.
- Based on engineering estimates. Conservatively assumes maximum H₂S concentration of 45 ppmvd.
- 3 total scrubbers available to Primary Clarifiers & Gravity Belt Thickener Building, however, only 2 in use at any one time, with one stand-by.
- Foul air flow through scrubber 3 assumed to be equal to aggregate of scrubbers 1 & 2.

St. Petersburg - SW WRF
Biosolids Improvement Project (BIP)

Potential to Emit - Existing Headworks Odor Control Systems

H₂S Emissions	
H ₂ S Concentration in Foul Air (Headworks)	275 ppmvd ^[1]
Average Temperature of Foul Air	68 °F ^[3]
Molecular Weight of H ₂ S	34 lb/lb-mol
Assumes Continuous Annual Operation	8760 hours
Control Efficiency (per scrubber) ^[2]	95 %
Design Capacity^[1]	
Existing Scrubber - Headworks	3700 scfm
H₂S PTE (tons per year)	
Existing Scrubber - Headworks	1.183 tpy

Notes: []:

1. Maximum measured influent H₂S concentration as monitored by SWWRF odor loggers located in the wet-well and headworks. Specifications - Volume No. 3, 60% Submittal. Value is downstream of Biotrickling Filters at inlet of carbon scrubbers.
2. Specifications are for 99% control efficiency. 95% conservatively assumed.
3. Assumed value based on engineering data from proposed odor control systems.

St. Petersburg - SW WRF
Biosolids Improvement Project (BIP)

Potential to Emit - Relocated 1750 kW Diesel Emergency Generator (New Source)

Basis:

Number of Units	1
Fuel	Diesel Fuel Oil
Power Rating	2,347 HP
Heat Input	17.26 mmBtu/hr
Heating Value of Fuel	137,000 Btu/gal ^[2]
Fuel Burn Rate	126 gal/hr ^[1]
Hours of Operation	100 hours per year
Density of Fuel	7.05 lb/gal ^[2]
Sulfur Content of Fuel	0.0015 % ^[3]

Global Warming Potentials ^[4]

CO ₂	1
CH ₄	25
N ₂ O	298

Pollutant	Mass Emission Rate			PTE (tpy)
	g/hp-hr	Notes	(lb/hr)	
CO	0.87	^[1,10]	4.52	0.23
NO _x	11.84	^[1,10]	61.24	3.06
PM	0.20	^[1,10]	1.04	0.052
PM ₁₀	0.20	^[5]	1.04	0.052
PM _{2.5}	0.20	^[5]	1.04	0.052
SO ₂	0.0052	^[6]	0.027	0.0013
VOC	0.25	^[1,10]	1.28	0.064
Lead	--		--	--
H ₂ SO ₄	0.0079	^[7]	0.041	0.0020
Fluorides	--		--	--
TRS (including H ₂ S)	--		--	--
GHG-Mass	526.196	^[9]	2,723	136
CO ₂	5.26E+02	^[8]	2,722.52	136.13
CH ₄	2.88E-02	^[8]	0.15	0.01
N ₂ O	--		--	--
GHG-CO ₂ e	526.887	^[9]	2,726	136
CO ₂	5.26E+02	^[4]	2,722.52	136.13
CH ₄	7.20E-01	^[4]	3.72	0.19
N ₂ O	--		--	--

Notes []:

1. Caterpillar Model 3516 1750 kW generator installed at Albert Whitted facility in 2000, to be relocated at SWWRF as part of BIP. Data from this specific engine is unavailable. Therefore, calculations based on 1999 performance data from vendor for Model 3516B 1825 kW diesel generator.
2. Based on diesel fuel characteristics listed in Reference 2.
3. Based on the requirements of 40 CFR Part 63, Subpart ZZZZ and 40 CFR Part 80.510(b).
4. CO₂ equivalents (CO₂e) based on the global warming potential for applicable pollutant as listed in Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials.
5. Conservatively assumed all particulate matter emissions are less than 2.5 micrometers in diameter.
6. Assumed all sulfur in the fuel is converted to SO₂.
7. Assumed 100% conversion of SO₂ to H₂SO₄.
8. Greenhouse gases (CO₂ and CH₄) emission factors obtained from AP-42 (Reference 1a), for a large stationary diesel engine (2-02-004-01).
9. The GHG emissions is the sum of all applicable GHG pollutants.
10. Emission factors enveloped across varying operational conditions to represent worst-case emissions.

References:

1. USEPA, AP-42, Fifth Edition, Vol. I. Chapter 3 "Stationary Internal Combustion Sources", Section 3.4 "Large Stationary Diesel and All Stationary Diesel-Fuel Engines". October 1996.
 - a. Table 3.4-1 "Gaseous Emission Factors for Large Stationary Diesel and All Stationary Diesel-Fuel Engines".
2. USEPA, AP-42, Fifth Edition, Vol. I. Appendix A "Miscellaneous Data & Conversion Factors". September 1985.

St. Petersburg - SW WRF
Biosolids Improvement Project (BIP)

HAP Emissions - Relocated 1750 kW Diesel Emergency Generator (New Source)

Basis:

Number of Units	1
Fuel	Diesel Fuel Oil
Power Rating	2,347 HP
Heat Input	17.26 mmBtu/hr
Heating Value of Fuel	137,000 Btu/gal ^[2]
Fuel Burn Rate	126 gal/hr ^[1]
Hours of Operation	100 hours per year
Density of Fuel	7.05 lb/gal ^[2]

Pollutant	Composition ^[3] (%wt)
Arsenic	8.50E-06
Beryllium	5.00E-06
Cadmium	2.10E-05
Chromium	9.50E-05
Manganese	2.10E-05
Mercury	4.00E-05
Nickel	3.38E-04

Pollutant	Mass Emission Rate			PTE (tpy)
	(lb/mmBtu)	Notes	(lb/hr)	
Benzene	7.76E-04	^[4]	1.34E-02	6.70E-04
Toluene	2.81E-04	^[4]	4.85E-03	2.43E-04
Xylenes	1.93E-04	^[4]	3.33E-03	1.67E-04
Formaldehyde	7.89E-05	^[4]	1.36E-03	6.81E-05
Acetaldehyde	2.52E-05	^[4]	4.35E-04	2.18E-05
Acrolein	7.88E-06	^[4]	1.36E-04	6.80E-06
Naphthalene	1.30E-04	^[5]	2.24E-03	1.12E-04
PAH	2.12E-04	^[5]	3.66E-03	1.83E-04
Arsenic	4.37E-06	^[6, 7]	7.55E-05	3.78E-06
Beryllium	2.57E-06	^[6, 7]	4.44E-05	2.22E-06
Cadmium	1.08E-05	^[6, 7]	1.87E-04	9.33E-06
Chromium	4.89E-05	^[6, 7]	8.44E-04	4.22E-05
Manganese	1.08E-05	^[6, 7]	1.87E-04	9.33E-06
Mercury	2.06E-05	^[6, 7]	3.55E-04	1.78E-05
Nickel	1.74E-04	^[6, 7]	3.00E-03	1.50E-04
Total HAPs				1.71E-03

Notes []:

1. Caterpillar Model 3516 1750 kW generator installed at Albert Whitted facility in 2000, to be relocated at SWWRF as part of BIP. Data from this specific engine is unavailable. Therefore, calculations based on 1999 performance data from vendor for Model 3516B 1825 kW diesel generator.
2. Based on diesel fuel characteristics listed in Reference 2.
3. Based on data provided by USEPA (Reference 3a) for No. 2 fuel oil/diesel fuel.
4. Emission factor obtained from AP-42 (Reference 1a).
5. Emission factor obtained from AP-42 (Reference 1b).
6. Conservatively assumed all metal in the fuel oil is emitted into the atmosphere.
7. Emission factor based on the metal composition in the fuel. See Table C47 of this Appendix for details.

References:

1. USEPA, AP-42, Fifth Edition, Vol. I. Chapter 3 "Stationary Internal Combustion Sources", Section 3.4 "Large Stationary Diesel and All Stationary Dual-Fuel Engines". October 1996.
 - a. Table 3.4-3 "Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines".
 - b. Table 3.4-4 "PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines".
2. USEPA, AP-42, Fifth Edition, Vol. I. Appendix A "Miscellaneous Data & Conversion Factors". September 1985.
3. USEPA, EPCRA Section 313: Industry Guidance: Electricity Generating Facilities. EPA-745-B-00-004. February 2000.
 - a. Table 3-4 "Estimated Concentration Values of EPCRA Section 313 Constituents in Crude Oil and Petroleum Products (Weight Percent)".

St. Petersburg - SW WRF
Biosolids Improvement Project (BIP)

Potential to Emit - 2000 kW Diesel Emergency Generator

Basis:

Number of Units	1
Fuel	Diesel Fuel Oil
Power Rating	2,682 HP
Heat Input	18.91 mmBtu/hr
Heating Value of Fuel	137,000 Btu/gal ^[2]
Fuel Burn Rate	138 gal/hr ^[1]
Hours of Operation	100 hours per year
Density of Fuel	7.05 lb/gal ^[2]
Sulfur Content of Fuel	0.0015 % ^[3]

Global Warming Potentials ^[4]

CO ₂	1
CH ₄	25
N ₂ O	298

Pollutant	Mass Emission Rate			PTE (tpy)
	g/hp-hr	Notes	(lb/hr)	
CO	0.30	^[1,10]	1.77	0.09
NO _x	5.45	^[1,10]	32.22	1.61
PM	0.03	^[1,10]	0.15	0.007
PM ₁₀	0.03	^[5]	0.15	0.007
PM _{2.5}	0.03	^[5]	0.15	0.007
SO ₂	0.0049	^[6]	0.029	0.0015
VOC	0.11	^[1,10]	0.65	0.033
Lead	--		--	--
H ₂ SO ₄	0.0076	^[7]	0.045	0.0022
Fluorides	--		--	--
TRS (including H ₂ S)	--		--	--
GHG-Mass	526.196	^[9]	3,111	156
CO ₂	5.26E+02	^[8]	3,111.12	155.56
CH ₄	2.88E-02	^[8]	0.17	0.01
N ₂ O	--		--	--
GHG-CO ₂ e	526.887	^[9]	3,115	156
CO ₂	5.26E+02	^[4]	3,111.12	155.56
CH ₄	7.20E-01	^[4]	4.25	0.21
N ₂ O	--		--	--

Notes []:

1. Based on performance data for Caterpillar model 3516C 2000 eKW Diesel Generator Set.
2. Based on diesel fuel characteristics listed in Reference 2.
3. Based on the requirements of 40 CFR Part 63, Subpart ZZZZ and 40 CFR Part 80.510(b).
4. CO₂ equivalents (CO₂e) based on the global warming potential for applicable pollutant as listed in Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials.
5. Conservatively assumed all particulate matter emissions are less than 2.5 micrometers in diameter.
6. Assumed all sulfur in the fuel is converted to SO₂.
7. Assumed 100% conversion of SO₂ to H₂SO₄.
8. Greenhouse gases (CO₂ and CH₄) emission factors obtained from AP-42 (Reference 1a), for a large stationary diesel engine (2-02-004-01).
9. The GHG emissions is the sum of all applicable GHG pollutants.

References:

1. USEPA, AP-42, Fifth Edition, Vol. I. Chapter 3 "Stationary Internal Combustion Sources", Section 3.4 "Large Stationary Diesel and All Stationary Dual-Fuel Engines". October 1996.
 - a. Table 3.4-1 "Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual-Fuel Engines".
2. USEPA, AP-42, Fifth Edition, Vol. I. Appendix A "Miscellaneous Data & Conversion Factors". September 1985.

St. Petersburg - SW WRF
Biosolids Improvement Project (BIP)

HAP Emissions - 2,000 kW Diesel Emergency Generator

Basis:

Number of Units	1
Fuel	Diesel Fuel Oil
Power Rating	2,682 HP
Heat Input	18.91 mmBtu/hr
Heating Value of Fuel	137,000 Btu/gal ^[2]
Fuel Burn Rate	138 gal/hr ^[1]
Hours of Operation	100 hours per year
Density of Fuel	7.05 lb/gal ^[2]

Pollutant	Composition ^[3] (%wt)
Arsenic	8.50E-06
Beryllium	5.00E-06
Cadmium	2.10E-05
Chromium	9.50E-05
Manganese	2.10E-05
Mercury	4.00E-05
Nickel	3.38E-04

Pollutant	Mass Emission Rate			PTE (tpy)
	(lb/mmBtu)	Notes	(lb/hr)	
Benzene	7.76E-04	^[4]	1.47E-02	7.34E-04
Toluene	2.81E-04	^[4]	5.31E-03	2.66E-04
Xylenes	1.93E-04	^[4]	3.65E-03	1.82E-04
Formaldehyde	7.89E-05	^[4]	1.49E-03	7.46E-05
Acetaldehyde	2.52E-05	^[4]	4.76E-04	2.38E-05
Acrolein	7.88E-06	^[4]	1.49E-04	7.45E-06
Naphthalene	1.30E-04	^[5]	2.46E-03	1.23E-04
PAH	2.12E-04	^[5]	4.01E-03	2.00E-04
Arsenic	4.37E-06	^[6, 7]	8.27E-05	4.13E-06
Beryllium	2.57E-06	^[6, 7]	4.86E-05	2.43E-06
Cadmium	1.08E-05	^[6, 7]	2.04E-04	1.02E-05
Chromium	4.89E-05	^[6, 7]	9.24E-04	4.62E-05
Manganese	1.08E-05	^[6, 7]	2.04E-04	1.02E-05
Mercury	2.06E-05	^[6, 7]	3.89E-04	1.95E-05
Nickel	1.74E-04	^[6, 7]	3.29E-03	1.64E-04
Total HAPs				1.87E-03

Notes []:

1. Based on performance data for Caterpillar model 3516C 2000 eKW Diesel Generator Set.
2. Based on distillate oil characteristics listed in Reference 2.
3. Based on data provided by USEPA (Reference 3a) for No. 2 fuel oil/diesel fuel.
4. Emission factor obtained from AP-42 (Reference 1a).
5. Emission factor obtained from AP-42 (Reference 1b).
6. Conservatively assumed all metal in the fuel oil is emitted into the atmosphere.
7. Emission factor based on the metal composition in the fuel. See Table C47 of this Appendix for details.

References:

1. USEPA, AP-42, Fifth Edition, Vol. I. Chapter 3 "Stationary Internal Combustion Sources", Section 3.4 "Large Stationary Diesel and All Stationary Dual-Fuel Engines". October 1996.
 - a. Table 3.4-3 "Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines".
 - b. Table 3.4-4 "PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines".
2. USEPA, AP-42, Fifth Edition, Vol. I. Appendix A "Miscellaneous Data & Conversion Factors". September 1985.
3. USEPA, EPCRA Section 313: Industry Guidance: Electricity Generating Facilities. EPA-745-B-00-004. February 2000.
 - a. Table 3-4 "Estimated Concentration Values of EPCRA Section 313 Constituents in Crude Oil and Petroleum Products (Weight Percent)".

**St. Petersburg SW WRF
Biosolids Improvement Project (BIP)**

Potential to Emit - Proposed Cooling Tower

Emissions Equation

PM

$$E = CWF \times DR \times \rho_{H2O} \times TDS \times \text{Hours of Op.} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{1 \text{ ton}}{2,000 \text{ lbs}}$$

where,

E = emissions, tons	see Table below
CWF = circulating water flow, gpm	650 gpm ^[1]
DR = drift rate, %	0.005 % ^[1]
ρ_{H2O} = density of water, lb/gal	8.3454 lb/gal
TDS = cycled water TDS, ppmw	1,494 ppmw ^[2]
Hours of Op. = hours of operation, hrs/yr	8,760 hrs/yr

PM₁₀

$$E = E_{PM} \times F_{PM10/PM}$$

where,

E = emissions, tons	
E_{PM} = PM emissions	
$F_{PM10/PM}$ = PM ₁₀ fraction, dimensionless	1 ^[3]

PM_{2.5}

$$E = E_{PM10} \times F_{PM2.5/PM10}$$

where,

E = emissions, tons	
E_{PM10} = PM ₁₀ emissions	
$F_{PM10/PM}$ = PM _{2.5} fraction, dimensionless	0.6 ^[4]

Cooling Tower Emissions

Activity	Potential Emissions (ton/yr)		
	PM	PM ₁₀	PM _{2.5}
Mechanical Draft Cooling Tower	0.11	0.11	0.06

Notes []:

1. Based on vendor data.
2. Site-specific water data was unavailable. Conservative preliminary engineering estimate based on Florida experience and 3 cycles of concentration.
3. Conservatively assumed all particulate matter emissions are less than 10 micrometers in diameter.
4. Fraction of PM₁₀ that is PM_{2.5} was obtained from SCAQMD (Reference 1a).

References:

1. South Coast AQMD, Air Guidance Book "Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds". Final. October 2006.
 - a. Appendix A - Table A "Updated CEIDARS Table with PM_{2.5} Fractions".

Attachment B – Revised FDEP Forms



Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - NON-TITLE V SOURCE

See Instructions for Form No. 62-210.900(3)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: City of St. Petersburg	
2. Site Name: City of St. Petersburg Southwest WRF	
3. Facility Identification Number: [X] Unknown	
4. Facility Location: Street Address or Other Locator: 3800 54 th Avenue South City: St. Petersburg County: Pinellas Zip Code: 33711	
5. Relocatable Facility? [] Yes [X] No	6. Existing Permitted Facility? [] Yes [X] No

Application Contact

1. Name and Title of Application Contact: Steve Marshall – Project Manager	
2. Application Contact Mailing Address: Organization/Firm: Engineering Department - City of St. Petersburg Street Address: One Fourth Street North City: St. Petersburg State: Florida Zip Code: 33701	
3. Application Contact Telephone Numbers: Telephone: (727) 893-7851 Fax: (727) 892-5243	
4. Application Contact E-mail Address: sdmarsha@stpete.org	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	
2. Permit Number:	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

- Initial non-Title V air operation permit for one or more existing, but previously unpermitted, emissions units.
- Initial non-Title V air operation permit for one or more newly constructed or modified emissions units.

Current construction permit number: _____

- Non-Title V air operation permit revision to address one or more newly constructed or modified emissions units.

Current construction permit number: _____

Operation permit number to be revised: _____

- Initial non-Title V air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s):

- Non-Title V air operation permit revision for a synthetic non-Title V source. Give reason for revision; e.g., to address one or more newly constructed or modified emissions units.

Operation permit number to be revised: _____

Reason for revision: _____

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

- Air construction permit to construct or modify one or more emissions units.
- Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.
- Air construction permit for one or more existing, but unpermitted, emissions units.

5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

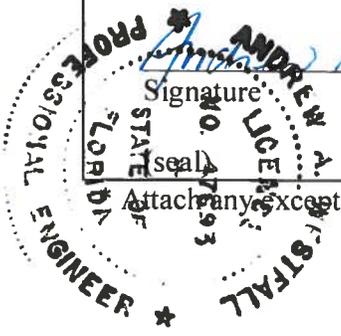
If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature Andrew A. Westfall

Date 10-1-14

Attach any exception to certification statement.



Construction/Modification Information

1. Description of Proposed Project or Alterations: See Sections 1 and 2 of the Technical Support Document preceding these forms.

2. Projected or Actual Date of Commencement of Construction: TBD

3. Projected Date of Completion of Construction: September 2018

Application Comment

The City of St. Petersburg is requesting a construction permit for the Biosolids Improvement Project at its Southwest Water Reclamation Facility (SWWRF). The Biosolids Improvement Project consists of the installation of two (2) 1100 kW gas fueled engine generators (Unit Nos. 1 & 2) that will be capable of firing pipeline natural gas as well as cleaned digester gas, a thermal oxidizer (waste gas burner) (Unit No. 3), and a number of exempt sources.

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap		4. Basis for Emissions Cap	5. Pollutant Comment
		lb/hour	tons/year		
CO	B				
NOX	B				
VOC	B				
SO2	B				
PM	B				
PM10	B				
PM2.5	B				
PB	B				
H2S	B				
SAM	B				
HAPS	B				
GHG	B				

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location: [X] Attached, Document ID: Appendix C
2. Facility Plot Plan: [X] Attached, Document ID: Appendix C
3. Process Flow Diagram(s): [X] Attached, Document ID: Appendix C
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [X] Attached, Document ID: Appendix E
5. Supplemental Information for Construction Permit Application: [] Attached, Document ID: _____ [] Not Applicable
6. Supplemental Requirements Comment:

Emissions Unit Control Equipment

1. Control Equipment/Method Description (limit to 200 characters per device or method):
2. Control Device or Method Code(s):

Emissions Unit Details

1. Package Unit:		
Manufacturer: Cummins (or equivalent)		Model Number: C1100 N6C
2. Generator Nameplate Rating: 1.1 MW		
3. Incinerator Information:		
Dwell Temperature:		°F
Dwell Time:		seconds
Incinerator Afterburner Temperature:		°F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate: 9.6		mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate:		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	8760 hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? EP-01		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:			
5. Discharge Type Code: V	6. Stack Height: 25 feet	7. Exit Diameter: 1.33 feet	
8. Exit Temperature: 757 °F	9. Actual Volumetric Flow Rate: 6650 acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: 17 East (km): 333.89166 North (km): 3067.11021			
14. Emission Point Comment (limit to 200 characters):			

Emissions Unit Information Section __1__ of __3__

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment __1__ of __2__

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Natural Gas combusted in Natural Gas Engine Generator No. 1		
2. Source Classification Code (SCC): 2-01-002-02		3. SCC Units: Million cubic feet burned
4. Maximum Hourly Rate: 0.0094 mmscf/hr	5. Maximum Annual Rate: 82.34 mmscf/yr	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 1020 (HHV) (Approx.)
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment __2__ of __2__

1. Segment Description (Process/Fuel Type) (limit to 500 characters): BUS Product Gas combusted in Natural Gas Engine Generator No. 1		
2. Source Classification Code (SCC): 2-01-007-02		3. SCC Units: Million cubic feet burned
4. Maximum Hourly Rate: 0.0097	5. Maximum Annual Rate: 84.97 mmscf/yr	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 990 (HHV)(Approx.)
10. Segment Comment (limit to 200 characters):		

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: CO		2. Pollutant Regulatory Code: NS	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 2.0 g/bhp-hr	4. Equivalent Allowable Emissions: 6.69 lb/hour 29.3 tons/year
5. Method of Compliance (limit to 60 characters): TBD	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Proposed Emission Limit	

Emissions Unit Information Section 1 of 3

Pollutant Detail Information Page 2 of 9

Potential Emissions

1. Pollutant Emitted: NOX		2. Pollutant Regulatory Code: NS	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 1.0 g/bhp-hr	4. Equivalent Allowable Emissions: 3.34 lb/hour	14.7 tons/year
5. Method of Compliance (limit to 60 characters): TBD		
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Proposed Emission Limit		

Emissions Unit Information Section 1 of 3

Pollutant Detail Information Page 3 of 9

Potential Emissions

1. Pollutant Emitted: VOC		2. Pollutant Regulatory Code: NS	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 0.7 g/bhp-hr	4. Equivalent Allowable Emissions: 2.34 lb/hour 10.3 tons/year
5. Method of Compliance (limit to 60 characters): TBD	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Proposed Emission Limit	

Emissions Unit Information Section 1 of 3

Pollutant Detail Information Page 4 of 9

Potential Emissions

1. Pollutant Emitted: SO2		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Emissions Unit Information Section 1 of 3

Pollutant Detail Information Page 5 of 9

Potential Emissions

1. Pollutant Emitted: PM		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Emissions Unit Information Section 1 of 3

Pollutant Detail Information Page 6 of 9

Potential Emissions

1. Pollutant Emitted: PM10		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential Emissions

1. Pollutant Emitted: PM2.5		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential Emissions

1. Pollutant Emitted: SAM		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 2	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Emissions Unit Information Section 1 of 3

Pollutant Detail Information Page 9 of 9

Potential Emissions

1. Pollutant Emitted: HAPS		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

<p>1. Process Flow Diagram <input checked="" type="checkbox"/> Attached, Document ID: App. C to Original Permit Application</p>
<p>2. Fuel Analysis or Specification <input checked="" type="checkbox"/> Attached, Document ID: App. E to Original Permit Application</p>
<p>3. Detailed Description of Control Equipment <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested</p>
<p>4. Description of Stack Sampling Facilities <input checked="" type="checkbox"/> Attached, Document ID: App. E to Original Permit Application</p>
<p>5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable</p>
<p>6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested</p>
<p>7. Operation and Maintenance Plan <input checked="" type="checkbox"/> Attached, Document ID: App. E to Original Permit Application</p>
<p>8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: App. D to Original Permit Application</p>
<p>9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable</p>
<p>10. Supplemental Requirements Comment:</p>

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.</p>		
<p>2. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Cummins model C1100 N6C 1100 kW (1517 bhp) Natural Gas Engine Generator No. 2 (or equivalent)</p>		
<p>3. Emissions Unit Identification Number: <input type="checkbox"/> No ID ID: 2 <input type="checkbox"/> ID Unknown</p>		
<p>4. Emissions Unit Status Code: C</p>	<p>5. Initial Startup Date: January 2016</p>	<p>6. Emissions Unit Major Group SIC Code: 49</p>
<p>7. Emissions Unit Comment: (Limit to 500 Characters)</p>		

Emissions Unit Control Equipment

1. Control Equipment/Method Description (limit to 200 characters per device or method):
2. Control Device or Method Code(s):

Emissions Unit Details

1. Package Unit:		
Manufacturer: Cummins (or equivalent)		Model Number: C1100 N6C
2. Generator Nameplate Rating: 1.1 MW		
3. Incinerator Information:		
Dwell Temperature:		°F
Dwell Time:		seconds
Incinerator Afterburner Temperature:		°F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate: 9.6		mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate:		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	8760 hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? EP-02		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:			
5. Discharge Type Code: V	6. Stack Height: 25 feet	7. Exit Diameter: 1.33 feet	
8. Exit Temperature: 757 °F	9. Actual Volumetric Flow Rate: 6650 acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: 17 East (km): 333.89166 North (km): 3067.11734			
14. Emission Point Comment (limit to 200 characters):			

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

3. Segment Description (Process/Fuel Type) (limit to 500 characters): Natural Gas combusted in Natural Gas Engine Generator No. 2		
4. Source Classification Code (SCC): 2-01-002-02		3. SCC Units: Million cubic feet burned
4. Maximum Hourly Rate: 0.0094 mmscf/hr	5. Maximum Annual Rate: 82.34 mmscf/yr	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 1020 (HHV) (Approx.)
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): BUS Product Gas combusted in Natural Gas Engine Generator No. 2		
2. Source Classification Code (SCC): 2-01-007-02		3. SCC Units: Million cubic feet burned
4. Maximum Hourly Rate: 0.0097	5. Maximum Annual Rate: 84.97 mmscf/yr	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 990 (HHV)(Approx.)
10. Segment Comment (limit to 200 characters):		

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: CO		2. Pollutant Regulatory Code: NS	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 2.0 g/bhp-hr	4. Equivalent Allowable Emissions: 6.69 lb/hour 29.3 tons/year
5. Method of Compliance (limit to 60 characters): TBD	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Proposed Emission Limit	

Potential Emissions

1. Pollutant Emitted: NOX		2. Pollutant Regulatory Code: NS	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 1.0 g/bhp-hr	4. Equivalent Allowable Emissions: 3.34 lb/hour 14.7 tons/year
5. Method of Compliance (limit to 60 characters): TBD	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Proposed Emission Limit	

Potential Emissions

1. Pollutant Emitted: VOC		2. Pollutant Regulatory Code: NS	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 0.7 g/bhp-hr	4. Equivalent Allowable Emissions: 2.34 lb/hour	10.3 tons/year
5. Method of Compliance (limit to 60 characters): TBD		
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Proposed Emission Limit		

Potential Emissions

1. Pollutant Emitted: SO2		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential Emissions

1. Pollutant Emitted: PM		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential Emissions

1. Pollutant Emitted: PM10		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential Emissions

1. Pollutant Emitted: PM2.5		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential Emissions

1. Pollutant Emitted: SAM		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 2	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential Emissions

1. Pollutant Emitted: HAPS		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 3	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: App. C to Original Permit Application
2. Fuel Analysis or Specification [X] Attached, Document ID: App. E to Original Permit Application
3. Detailed Description of Control Equipment [] Attached, Document ID: _____ [X] Not Applicable [] Waiver Requested
4. Description of Stack Sampling Facilities [X] Attached, Document ID: App. E to Original Permit Application
5. Compliance Test Report [] Attached, Document ID: _____ [] Previously submitted, Date: _____ [X] Not Applicable
6. Procedures for Startup and Shutdown [] Attached, Document ID: _____ [X] Not Applicable [] Waiver Requested
7. Operation and Maintenance Plan [X] Attached, Document ID: App. E to Original Permit Application
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: App. D to Original Permit Application
9. Other Information Required by Rule or Statute [] Attached, Document ID: _____ [X] Not Applicable
10. Supplemental Requirements Comment:

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through G as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one) <input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent). <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions. <input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.		
2. Description of Emissions Unit Addressed in This Section (limit to 60 characters): 140 scfm Thermal Oxidizer (Waste Gas Burner) No. 3		
3. Emissions Unit Identification Number: ID: 3		<input type="checkbox"/> No ID <input type="checkbox"/> ID Unknown
4. Emissions Unit Status Code: C	5. Initial Startup Date: September 2018	6. Emissions Unit Major Group SIC Code: 49
7. Emissions Unit Comment: (Limit to 500 Characters)		

Emissions Unit Control Equipment

1. Control Equipment/Method Description (limit to 200 characters per device or method):
2. Control Device or Method Code(s):

Emissions Unit Details

1. Package Unit: Manufacturer: TBD	Model Number: TBD
2. Generator Nameplate Rating: 140 scfm	
3. Incinerator Information:	
Dwell Temperature:	°F
Dwell Time:	seconds
Incinerator Afterburner Temperature:	°F

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr tons/day
3. Maximum Process or Throughput Rate: 140 scfm	
4. Maximum Production Rate:	
5. Requested Maximum Operating Schedule:	
hours/day	days/week
weeks/year	8760 hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):	

B. EMISSION POINT (STACK/VENT) INFORMATION

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? EP-03		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:			
5. Discharge Type Code: V	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: 2,700 °F	9. Actual Volumetric Flow Rate: TBD acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: 20 feet		
13. Emission Point UTM Coordinates: Zone: 17 East (km): 334.19148 North (km): 3067.03692			
14. Emission Point Comment (limit to 200 characters):			

C. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

5. Segment Description (Process/Fuel Type) (limit to 500 characters): Waste Gas Combusted by Thermal Oxidizer No. 3		
6. Source Classification Code (SCC): 5-01-007-89		3. SCC Units: Million cubic feet burned
4. Maximum Hourly Rate: 0.0084 mmscf/hr	5. Maximum Annual Rate: 73.58 mmscf/yr	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 186 (Approx.)
10. Segment Comment (limit to 200 characters):		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Natural Gas combusted by Thermal Oxidizer No. 3 pilot		
2. Source Classification Code (SCC): 2-01-007-02		3. SCC Units: Million cubic feet burned
4. Maximum Hourly Rate: 0.0001	5. Maximum Annual Rate: 0.876 mmscf/yr	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 1020 (HHV)(Approx.)
10. Segment Comment (limit to 200 characters):		

D. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION

Potential Emissions

1. Pollutant Emitted: CO		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Potential Emissions

1. Pollutant Emitted: NOX		2. Pollutant Regulatory Code:EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters): Stack Testing	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Emissions Unit Information Section 3 of 3

Pollutant Detail Information Page 3 of 4

Potential Emissions

1. Pollutant Emitted: VOC		2. Pollutant Regulatory Code: EL	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

Emissions Unit Information Section 3 of 3

Pollutant Detail Information Page 4 of 4

Potential Emissions

1. Pollutant Emitted: SO2		2. Pollutant Regulatory Code: NS	
3. Primary Control Device Code:	4. Secondary Control Device Code:	5. Total Percent Efficiency of Control:	
6. Potential Emissions: See Attachment A for emissions calculations		7. Synthetically Limited? []	
8. Emission Factor: Reference:		9. Emissions Method Code: 5	
10. Calculation of Emissions (limit to 600 characters): See Attachment A to <i>Responses to FDEP Request for Additional Information (RAI) of September 10, 2014</i> for emissions calculations			
11. Pollutant Potential Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code: Rule	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

G. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: App. C to Original Permit Application
2. Fuel Analysis or Specification [X] Attached, Document ID: App. E to Original Permit Application
3. Detailed Description of Control Equipment [] Attached, Document ID: _____ [X] Not Applicable [] Waiver Requested
4. Description of Stack Sampling Facilities [X] Attached, Document ID: App. E to Original Permit Application
5. Compliance Test Report [] Attached, Document ID: _____ [] Previously submitted, Date: _____ [X] Not Applicable
6. Procedures for Startup and Shutdown [] Attached, Document ID: _____ [X] Not Applicable [] Waiver Requested
7. Operation and Maintenance Plan [X] Attached, Document ID: App. E to Original Permit Application
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: App. D to Original Permit Application
9. Other Information Required by Rule or Statute [] Attached, Document ID: _____ [X] Not Applicable
10. Supplemental Requirements Comment: