Tammy
Module
AB006

10

APPLICATION

AIR CONSTRUCTION PERMIT APPLICATION FOR NEW BIOENERGY FACILITY

Harvest Energy Garden – Orlando

Harvest Power Orlando, LLC

RECEIVED
MAR 2 2 2012
DEP Central Dist

Prepared For: Harvest Power Orlando, LLC
2151 Bear Island Road
Lake Buena Vista, FL 32830

Prepared By: Golder Associates Inc.
6026 NW 1st Place
Gainesville, FL 32607 USA

Distribution: 4 copies – FDEP
2 copies – Harvest Power Orlando, LLC
1 copy – Golder Associates Inc.

March 2012

113-87708

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Golder Associates

APPLICATION FOR AIR PERMIT

LONG FORM

Department of Environmental Protection

RECEIVED
MAR 2 2 2012
DEP Central Dist.

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit:

- For any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- To establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial, revised, or renewal Title V air operation permit.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **Harvest Power Orlando, LLC**	
2. Site Name: **Harvest Energy Garden - Orlando**	
3. Facility Identification Number:	
4. Facility Location... Street Address or Other Locator: **2151 Bear Island Road** City: **Lake Buena Vista** County: **Orange** Zip Code: **32830**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☐ Yes ☒ No

Application Contact

1. Application Contact Name: **Alex MacFarlane, VP of Project Development**
2. Application Contact Mailing Address: Organization/Firm: **Harvest Power Orlando, LLC** Street Address: **221 Crescent Street, Suite 402** City: **Waltham** State: **MA** Zip Code: **02453**
3. Application Contact Telephone Numbers: Telephone: **(781)314 - 9511** Fax: ( ) -
4. Application Contact E-mail Address: **AMacfarlane@harvestpower.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application: 3-22-12	3. PSD Number (if applicable):
2. Project Number(s): 0951340-001-AC	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

This application for air permit is being submitted to obtain: (Check one)

Air Construction Permit

☒ Air construction permit.

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

☐ Initial Title V air operation permit.

☐ Title V air operation permit revision.

☐ Title V air operation permit renewal.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

☐ Air construction permit and Title V permit revision, incorporating the proposed project.

☐ Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

☐ I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

Application to build a biogas production facility that will take organic wastes from the Reedy Creek wastewater treatment facility and other area facilities. The biogas will be combusted *in combined heat and power engines to produce electricity for sale to the grid and heat for* use at the facility.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
	Bio-Scrubber/Bio-Filter	AC1E	$1,000
	Emergency Biogas Flare	AC1E	$1,000
	Power Generation / Heat Recovery	AC1B	$5,000

Application Processing Fee

Check one: ☒ Attached - Amount: $ 7,000 ☐ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :
   John M. Eustermann, Sr. Vice President, General Counsel
2. Owner/Authorized Representative Mailing Address:
   Organization/Firm: **Harvest Power Inc.**
   Street Address: **221 Crescent Street, Suite 402**
   City: **Waltham** State: **MA** Zip Code: **02453**
3. Owner/Authorized Representative Telephone Numbers:
   Telephone: **(781)314 - 9500** Fax: ( ) -
4. Owner/Authorized Representative E-mail Address: **JEustermann@harvestpower.com**
5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.

   Signature

   3.16.2012
   Date

APPLICATION INFORMATION

Application Responsible Official Certification

Complete if applying for an initial, revised, or renewal Title V air operation permit or concurrent processing of an air construction permit and revised or renewal Title V air operation permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):

- ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.
- ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
- ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.
- ☐ The designated representative at an Acid Rain source or CAIR source.

3. Application Responsible Official Mailing Address...
Organization/Firm:
Street Address:
City: State: Zip Code:

4. Application Responsible Official Telephone Numbers...
Telephone: ( ) ext. Fax: ( )

5. Application Responsible Official E-mail Address:

6. Application Responsible Official Certification:

I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

Signature Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: **Philip D. Cobb**
   Registration Number: **72386**
2. Professional Engineer Mailing Address...
   Organization/Firm: **Golder Associates Inc.****
   Street Address: **6026 NW 1st Place**
   City: **Gainesville** State: **FL** Zip Code: **32607**
3. Professional Engineer Telephone Numbers...
   Telephone: **(352) 336-5600** ext. Fax: **(352) 336-6603**
4. Professional Engineer E-mail Address: **pcobb@golder.com**
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.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal 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.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal 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 (seal) Date: 3/21/2012

* Attach any exception to certification statement.
**Board of Professional Engineers Certificate of Authorization #00001670.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone **35** East (km) **522,469** North (km) **9,059,422**		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) **28 / 22 / 35** Longitude (DD/MM/SS) **81 / 35 / 27**	
3. Governmental Facility Code: **0**	4. Facility Status Code: **C**	5. Facility Major Group SIC Code: **49**	6. Facility SIC(s): **452**
7. Facility Comment :			

Application Contact

1. Application Contact Name: **Alex MacFarlane, VP of Project Development**
2. Application Contact Mailing Address: Organization/Firm: **Harvest Power Orlando, LLC** Street Address: **221 Crescent Street, Suite 402** City: **Waltham** State: **MA** Zip Code: **02453**
3. Application Contact Telephone Numbers: Telephone: **(781)314 - 9511** Fax: ( ) -
4. Application Contact E-mail Address: **AMacfarlane@harvestpower.com**

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) ext. Fax: ( )
4. Facility Primary Responsible Official E-mail Address:

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☒ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☐ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment:	

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
Greenhouse Gases – GHGs	B	N
Carbon Dioxide Equivalents – CO_2e	B	N
Carbon Monoxide – CO	A	N
Volatile Organic Compounds – VOC	B	N
Nitrogen Oxides – NOx	B	N
Sulfur Dioxide – SO2	B	N
Hazardous Air Pollutants – HAPS	A	N
Particulate Matter – PM	B	N
Particulate Matter – PM10	B	N
Particulate Matter – PM2.5	B	N
Total Reduced Sulfur – TRS	B	N
Hydrogen Sulfide – H2S	B	N
Ammonia – NH3	B	N
Acetaldehyde – H001	B	N
Carbon Disulfide – H032	B	N
Carbonyl Sulfide – H034	B	N
Formaldehyde – H095	A	N
Methanol – H115	B	N
Methyl Isobutyl Ketone – H123	B	N
Toluene – H169	B	N
Triethylamine – H179	B	N

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID's Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: HP-FI-C1 ☐ Previously Submitted, Date:_____
2. Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: HP-FI-C2 ☐ Previously Submitted, Date:_____
3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: HP-FI-C3 ☐ Previously Submitted, Date:_____

Additional Requirements for Air Construction Permit Applications

1. Area Map Showing Facility Location: ☒ Attached, Document ID: HP-FI-CC1 ☐ Not Applicable (existing permitted facility)
2. Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL): ☐ Attached, Document ID:_____
3. Rule Applicability Analysis: ☒ Attached, Document ID: Part B
4. List of Exempt Emissions Units: ☐ Attached, Document ID:_____ ☒ Not Applicable (no exempt units at facility)
5. Fugitive Emissions Identification: ☐ Attached, Document ID:_____ ☒ Not Applicable
6. Air Quality Analysis (Rule 62-212.400(7), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
7. Source Impact Analysis (Rule 62-212.400(5), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
8. Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
9. Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications

1. List of Exempt Emissions Units:
   ☐ Attached, Document ID:_____ ☐ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications

1. List of Insignificant Activities: (Required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable (revision application)

2. Identification of Applicable Requirements: (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought)
   ☐ Attached, Document ID:_____
   ☐ Not Applicable (revision application with no change in applicable requirements)

3. Compliance Report and Plan: (Required for all initial/revision/renewal applications)
   ☐ Attached, Document ID:_____
   Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.

4. List of Equipment/Activities Regulated under Title VI: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____
   ☐ Equipment/Activities Onsite but Not Required to be Individually Listed
   ☐ Not Applicable

5. Verification of Risk Management Plan Submission to EPA: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable

6. Requested Changes to Current Title V Air Operation Permit:
   ☐ Attached, Document ID:_____ ☐ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program

1. Acid Rain Program Forms:

   Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable (not an Acid Rain source)

   Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable

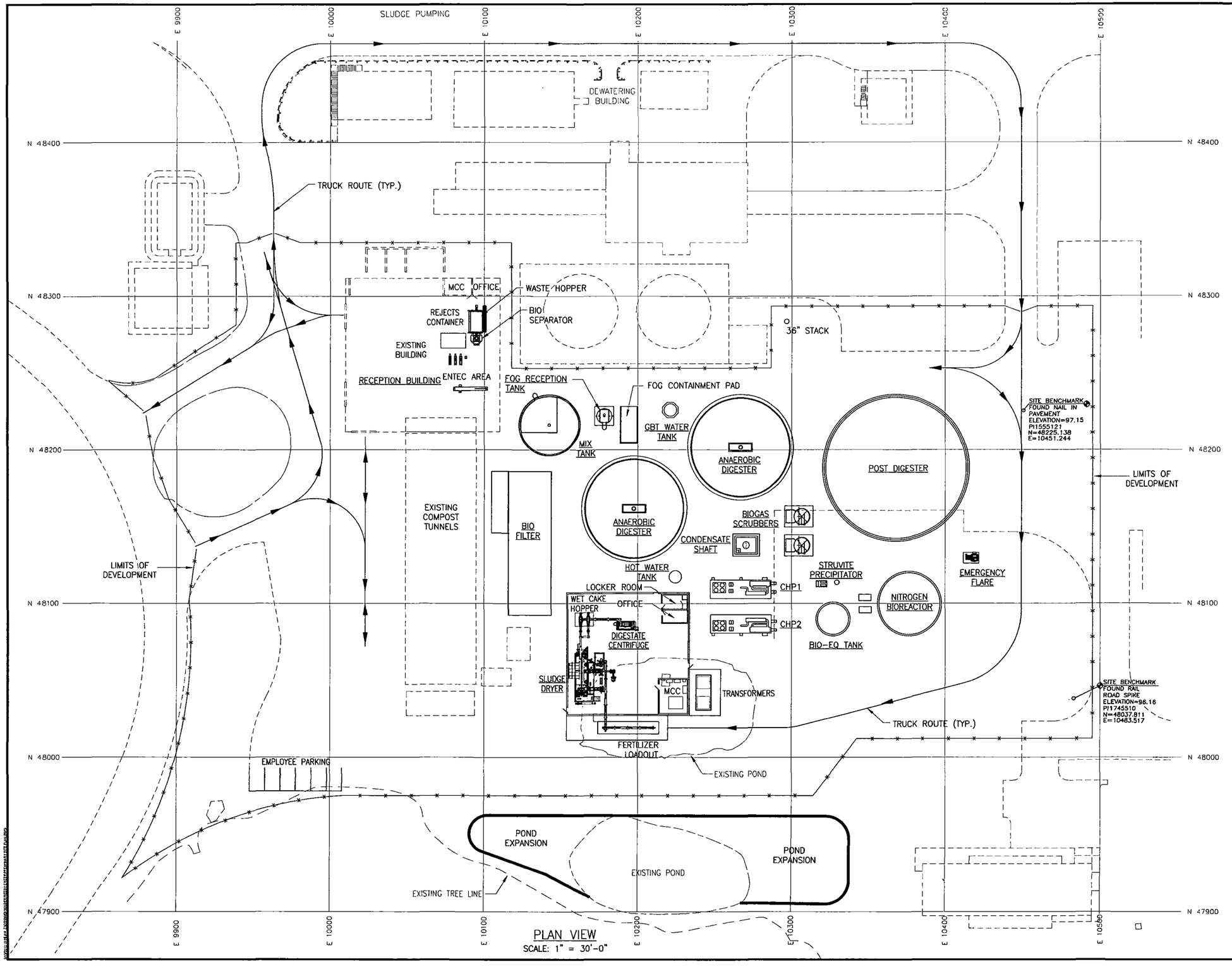
   New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable

2. CAIR Part (DEP Form No. 62-210.900(1)(b)):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable (not a CAIR source)

Additional Requirements Comment

ATTACHMENT HP-FI-C1

FACILITY PLOT PLAN



PLAN VIEW
SCALE: 1" = 30'-0"

Tank Item	Units	Value	Comments
FOG Reception Tank			
Number	#	1	
Volume	m3	70	
Diameter	m	3.6	
Height above ground	m	1.8	Approx
Mix Tank			
Number	#	1	
Volume	m3	500	
Diameter	m	11.0	Outer
Height above ground	m	8.0	Approx
Primary CSTR AD			
Liquid Volume (each)	m3	4,500	
Number	#	2	
Diameter	m	20.1	Outer w insulation
Water Depth	m	17.0	
Height above ground	m	18.0	Approx to Agitator Flange
Post AD			
Total Volume	m3	7,700	
Liquid Volume	m3	4,500	
Gas Volume	m3	3,200	
Number	#	1	
Diameter	m	23.0	Outer
Water Depth	m	7.0	
Height above ground	m	10.5	w/ Gas Holder
Biogas Scrubber			
Number	#	2	
Volume	m3	200	
Diameter	m	3.0	
Height above ground	m	16.8	Approx
Composting Shed			
Number	#	1	
Length	m	40	Outer
Width	m	36	Outer
Height above ground	m	9.2	
Engine Containers			
Number	#	2	
Length	m	10.6	
Width	m	3.7	
Height above ground	m	3.0	
Biogas Emergency Flare			
Number	#	1	
Diameter	m	1.5	
Height above ground	m	6.0	
Boiler Stack			
Number	#	1	
Diameter	m	0.9	
Height above ground	m	6.0	
GBT Water Tank			
Number	#	1	
Volume	m3	10	
Diameter	m	2.4	Outer
Height above ground	m	3.0	Approx
Struvite Precipitator			
Number	#	1	
Diameter	m	0.9	
Height above ground	m	8.5	Approx
Bio Equalization			
Number	#	1	
Volume	m3	1520	
Diameter	m	5.5	
Height	m	7.6	
Bio N Destruct Tank			
Liquid Volume	m3	757	
Diameter	m	12.2	
Water Depth	m	6.4	
Total Height	m	7.6	

REV	DESCRIPTION	DATE	APPR. BY	MADE BY
E	FOR REVIEW	08MAR12	JDD	LTE
D	FOR REVIEW	24FEB12	JDD	LTE
C	FOR REVIEW	22FEB12	JDD	LTE
B	FOR REVIEW	10FEB12	JDD	LTE
A	FOR PROPOSAL	110CT11	JDD	LTE

REVISIONS

PRELIMINARY
WORK IN PROGRESS

DRAWING SCALE MAY BE ALTERED
0 20' 40' 60'

DRAWN	CHKD.	APPR.	DATE	LOGIN NAME
LTE	JDD	JDD	110CT11	

SCALE: 1" = 30' | DWG SIZE: D | LOGIN
FILE LOCATION:

ATTACHMENT HP-FI-C1

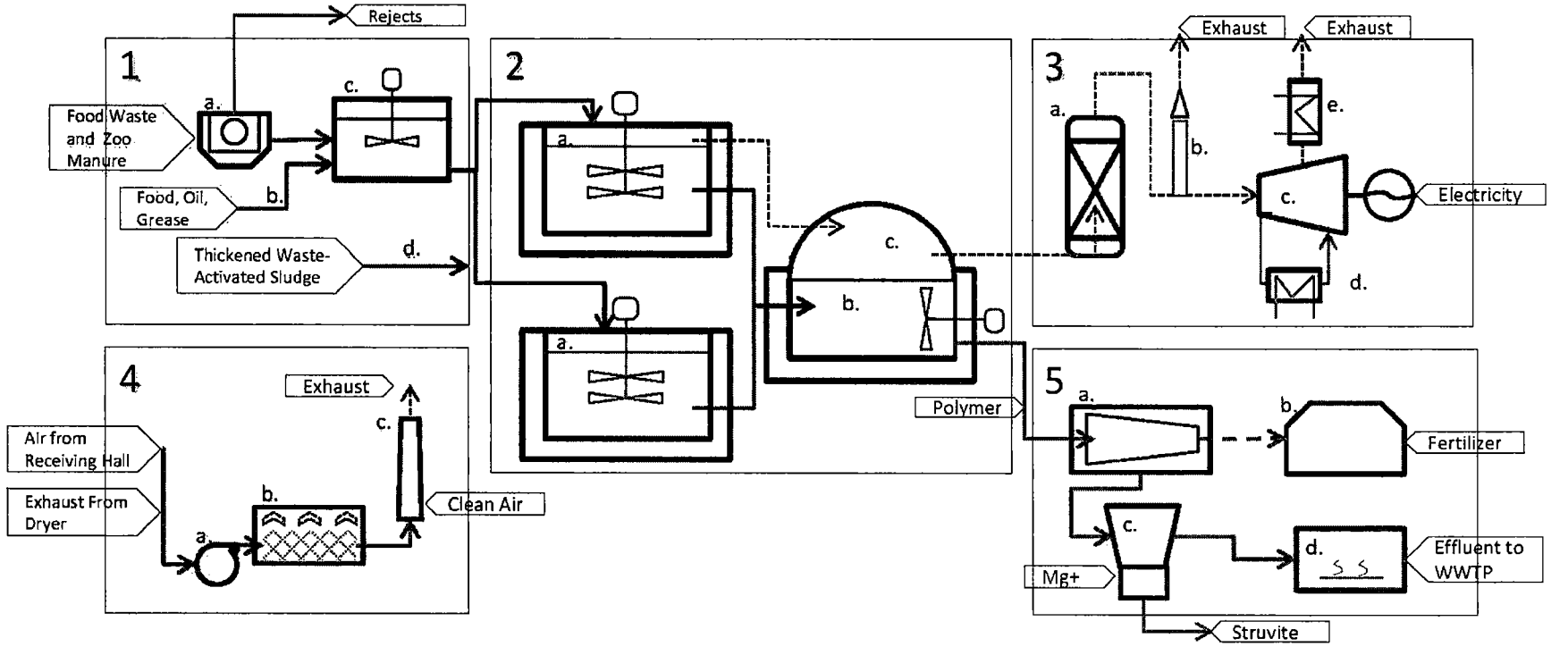
REEDY CREEK WWTP
SOLIDS FERMENTATION AND NUTRIENT RECOVERY SYSTEM
GENERAL ARRANGEMENT

HARVEST POWER
ORLANDO, FLORIDA

CONTRACT NO.	DRAWING NO.	REV.
20BP2949	GA-01	E

ATTACHMENT HP-FI-C2

PROCESS FLOW DIAGRAM



1	FEEDSTOCK RECEIVING and PRE-TREATMENT	a. Food waste contaminant removal b. Food, oil, grease receiving c. Mix tank d. Thickened waste-activated sludge addition and metering
2	DIGESTERS	a. Continuously stirred tank reactor digesters b. Post-digester c. Integrated gasholder
3	BIOGAS, POWER GENERATION and HEAT RECOVERY	a. Biogas scrubber, water knockout b. Emergency flare c. CAT Engine gen-set d. Water jacket heat recovery for process heat e. Thermal oil exhaust heat recovery for dryer
4	ODOR REMOVAL	a. Collection ductwork and blower b. 90+ odor removal bio-scrubber c. Stack with real-time odor monitoring
5	DIGESTATE MANAGEMENT	a. Centrifuge for liquid/solids separation b. Digestate solids indirect dryer c. Phosphorus recovery from centrate d. Liquid effluent nit/de-nitrification

ATTACHMENT HP-FI-C2
PROCESS FLOW DIAGRAM
HARVEST POWER ORLANDO, LLC
HARVEST ENERGY GARDEN – ORLANDO
LAKE BUENA VISTA, FLORIDA

Process Flow Legend:
Solid / Liquid ——►
Gas – – – – –►
Steam ----------►

Golder Associates

Y:\Projects\2011\113-87708 HP-EnergyGarden\ACapp\Final_031912\Att\HP-FI-C2.vsd

ATTACHMENT HP-FI-C3

PRECAUTIONS TO PREVENT EMISSIONS OF
UNCONFINED PARTICULATE MATTER

ATTACHMENT HP-FI-C3

PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

Harvest Power Orlando, LLC (HP) will take reasonable precautions to prevent emissions of unconfined PM at the Harvest Energy Garden – Orlando facility. These consist of the following:

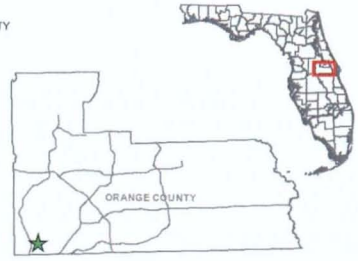
- Process tanks and equipment will be covered and sealed to the extent possible
- Receiving and handling of solids and wastes will take place inside of the receiving building, which will be vented to the bio-scrubber
- Emissions from the dryer will be vented to the bio-scrubber prior being released to the environment
- Fugitive PM emissions from truck traffic will be minimized by using paved roads

ATTACHMENT HP-FI-CC1

AREA MAP SHOWING FACILITY LOCATION

LEGEND

PROPOSED BIOGAS GENERATING FACILITY



1,000 0 1,000 Feet

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

HARVEST POWER ORLANDO, LLC
HARVEST ENERGY GARDEN - ORLANDO

TITLE

ATTACHMENT HP-FI-CC1
AREA MAP SHOWING FACILITY LOCATION

REFERENCES

PROPOSED BIOGAS FACILITY LOCATION, GOLDER ASSOCIATES INC., 2012

IMAGERY SUPPLIED BY ESRI INC. ©2010 MICROSOFT CORPORATION AND IT'S DATA SUPPLIERS. ACCESSED 3/15/2012

Golder Associates
Gainesville, Florida

PROJECT No.		113-87708	FILE No.	11387708_B001
DESIGN	PDC	03/09/12	SCALE: AS SHOWN	REV. 0
GIS	NRL	03/11/12		
CHECK	PDC	03/12/12		
REVIEW	TY	03/12/12		

HP-FI-CC1

Map Document: TB-PS-A.mxt / Modified 3/15/2010 5:11:02 PM / Plotted 3/16/2010 3:12:54 PM by rlamar

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [1]
Bio-Scrubber/Bio-Filter

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☒ 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).

☐ 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.

☐ 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:
Bio-Scrubber/Bio-Filter

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**June 1, 2012**	**April 15, 2013**	**49**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
This emissions unit includes the receiving hall with all processing areas, solids dewatering and drying processes, and the bio-scrubber that controls odors from that facility. The bio-scrubber controls emissions from the receiving hall, three receiving tanks, the digestate handling building, and the dryer.

EMISSIONS UNIT INFORMATION
Section [1]
Bio-Scrubber/Bio-Filter

Emissions Unit Control Equipment/Method: Control **1** of **1**

1. Control Equipment/Method Description: **Gas Scrubber (General, Not Classified) – Bio-Scrubber**
2. Control Device or Method Code: **013**

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: **301,900 TPY biosolids**	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	
24 hours/day	**7** days/week
52 weeks/year	**8,760** hours/year
6. Operating Capacity/Schedule Comment:	
Maximum throughput rate corresponds to 20 million gallons per day (MGD).	

EMISSIONS UNIT INFORMATION
Section [1]
Bio-Scrubber/Bio-Filter

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **Bio-Filter**		2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **4.17** feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: **40,590** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Waste Disposal; Site Remediation; Biological Treatment; Anaerobic Biodegredation: Digester**		
2. Source Classification Code (SCC): **5-04-107-21**	3. SCC Units: **Tons Biosolids**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **235,580**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
VOC	013		NS
TRS	013		NS
H2S	013		NS
HAPS	013		NS
Ammonia – NH3	013		NS
Acetaldehyde – H001	013		NS
Carbon Disulfide – H032	013		NS
Carbonyl Sulfide – H034	013		NS
Methanol – H114	013		NS
Methyl Isobutyl Ketone – H123	013		NS
Toluene – H169	013		NS
Triethylamine – H179	013		NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **3.98** lb/hour **17.45** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **HAPS**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **0.27** lb/hour **1.17** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **TRS**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **0.16** lb/hour **0.70** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H2S**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **0.077** lb/hour **0.34** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H001**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **8.59×10^{-4}** lb/hour **0.0038** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H032**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **2.20×10^{-4}** lb/hour **0.0010** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H034**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **1.30×10^{-4}** lb/hour **0.00057** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H114**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **6.94×10^{-5}** lb/hour **0.00030** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H123**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **0.13** lb/hour **0.55** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H169**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **3.99×10^{-5}** lb/hour **0.00017** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H179**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **0.14** lb/hour **0.61** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NH3**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **0.21** lb/hour **0.94** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Comment** Reference: **See Comment**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

See Appendix A, Table A-1 for calculations of emissions.

11. Potential, Fugitive, and Actual Emissions Comment:

Emission rate based gas constituent assumptions (see Attachment HP-EU1-I3).

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

EMISSIONS UNIT INFORMATION
Section [1]
Bio-Scrubber/Bio-Filter

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation **1** of **1**

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9**	
5. Visible Emissions Comment: **General visible emissions limitation based on Rule 62-296.320(4)(b)1, F.A.C. There is no testing requirement imposed by the rule.**	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

EMISSIONS UNIT INFORMATION
Section [1]
Bio-Scrubber/Bio-Filter

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **HP-FI-C2** ☐ Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **HP-EU1-I3** ☐ Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   ☐ Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   ☐ To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   ☒ Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: **Part B** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☒ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: _____
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: _____ ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☐ Not Applicable

Additional Requirements Comment

ATTACHMENT HP-EU1-I3

DETAILED DESCRIPTION OF CONTROL EQUIPMENT

Biofilter Odor Control BUDGET PROPOSAL
Harvest Power Orlando – 12-6001

March 16, 2012

To: Brandon Moffatt
Harvest Power

Re: Harvest Power Orlando

Dear Brandon,

[redacted] is pleased to provide you with the following proposal for a complete biological odour control system for the Harvest Power Project in Orlando, FL. This system is designed to remove odour from the following areas at the future organic waste processing facility and existing wastewater treatment facility as defined in the Scope of Supply contained in this proposal. Also refer to the 'HPO Draft Ventilation Plan' for details on process calculations:

1. Reception tanks, 1 – 3
2. Mix tank
3. Receiving hall
4. Reception pit below grade
5. Separation & drying area
6. Load out area
7. Dryer
8. Digested sludge filtrate storage

The proposed treatment system uses a humidifier followed by a biofilter, operated under negative pressure with a 60ft stack. Stack height will need to be confirmed based on dispersion modelling. Also note that it would be possible to retrofit the humidifier into an ammonia scrubber in the future if ammonia levels are higher than expected (<25 ppm).

Please feel free to contact me if you have any questions or comments. We look forward to working together with you on this project.

Biofilter Odor Control BUDGET PROPOSAL
Harvest Power Orlando – 12-6001

1.0 Product Description

The biofilter system extracts foul air for subsequent preconditioning in the humidification stage and oxidation through the [redacted] media bed prior to atmospheric discharge.

Odorous compounds in the air entering the biofilter are solubilized into the moisture layer surrounding the individual media particles or are adsorbed directly to their surface. Bacteria present within this moisture film utilize the compounds as substrate. The compounds are biologically oxidized to CO_2, H_2O and inorganic salts and clean air is discharged to atmosphere. It is critical that the filter creates an optimal environment to enhance microbial development. Maintaining proper air temperature, pH, moisture and nutrient levels are essential for favorable biofilter performance and removal efficiency.

2.0 Project Details

Process Parameter	**Value**		
Flow Rate:	71,000 m^3/hr (41,800 cfm)		Calculated[1]
Inlet Air Temperature:	50 – 110 °F		Assumed
Inlet Relative Humidity:	>50%		Assumed
Water Hardness:	50 ppm maximum allowed		Required
Type of Contaminant	**Average / Peak Con. Levels**		
Hydrogen Sulfide:	<0.5 ppm	1 ppm	Assumed
Ammonia:	<10 ppm	25 ppm	Assumed[2]
Total Odour:	7100 OU	15,000 OU	Calculated[1]

1 – Refer to 'HPO Draft Ventilation Plan' for calculation details and assumptions
2 – Will need to convert humidifier to ammonia scrubber by adding chemical addition system and chemical storage tanks if average ammonia levels are higher than 25ppm to maintain odour performance

Design Parameter	**Value**
Material of Construction:	Concrete
EBRT:	35 seconds
Media Volume:	24,400 ft^3
Concrete Vessel Dimensions:	70 ft length : 75 ft width : 12 ft depth
Total Footprint Dimensions, including humidifiers and fans, estimate:	95 ft length : 75ft width
Water Consumption, Humidifier:	2100 GPD
Water Consumption, Biofilter Irrigation:	1825 GPD
Electrical - Main Power supply:	480V, 3Ph, 60Hz
*Concrete Volume (Estimate):	325 yds^3

*Concrete not in [redacted] Scope of Supply, to be provided and installed by Contractor.

System Performance

A. When loaded under average and peak conditions the biofiltration system will achieve at least 99 percent removal of H_2S or <0.1 ppm at the system discharge, whichever is greater, when operating within the process parameters shown above.

B. When loaded under average and peak conditions the biofilter system shall provide at least 90 percent odor removal for inlet concentration levels between 5,000 and 15,000 OU. For inlet concentration levels less than 5,000 OU, the outlet concentration levels shall be less than 500 OU. (Odor concentrations to be determined using ASTM-E679 with a 20 liter/minute odor panel presentation rate).

4.0 Warranties

A. The Manufacturer warrants that the biofilter media will not compact, degrade or decompose for a period of 10 years from the date of Substantial Completion, provided that the system is operated in accordance with the Manufacturer's printed Operation and Maintenance Manuals.

B. All mechanical components will be warranted free of manufacturing defects for a period of 12 months from Substantial Completion, or 18 months from shipment, whichever occurs first.

5.0 Scope of Supply

1. Inorganic biofilter media, supplied in loose bulk.
2. Biofilter media support flooring, pre-cast concrete slats.
3. Hollowcore roof panels.
4. (2) Horizontal Cross-Flow Humidification Scrubbers, each including the following components:
    i. FRP vessel with flanged inlet/outlet connections, access hatch
    ii. (1) 5 HP recirculation pumps.
    iii. Polypropylene mass transfer packing
    iv. Schedule 80 PVC manifold and spray nozzles.
5. (2) Biofilter media irrigation systems, 1 per cell. Composed of Schedule 80 PVC pipe, and spray nozzles for optimized surface coverage of the Biofilter media bed.
6. (2) 75 HP centrifugal FRP exhaust fans, each rated for 20,900 cfm or 50% of total flowrate, 12" WC, TEFC, Class 1, Division 2 motor.

    Note: Fan sizing includes maximum 10" W.C. pressure loss through the odor control system, and 2" W.C. for external system losses.

7. (1) Control Panel:
    i. NEMA 4X 304 stainless steel enclosure with pedestal legs.
    ii. Door mounted fused disconnect.
    iii. System ON pilot light.
    iv. (2) Motor starters and Hand/Off/Auto selector switches for recirculation pumps.
    v. Status lights (on when running) for fan and recirculation pump.
    vi. Recirculation low flow alarm light.
    vii. Alarm reset push button.
    viii. Dry contacts for transmitting signals to remote location.
8. (2) NEMA 4X Variable Frequency Drive Panels for exhaust fans, 75HP each
9. (2) Water panels, each housing the following instrumentation and fluid control valves:
    i. (1) Pressure indicator on water supply line.
    ii. (1) Flow indicator/switch, to display recirculated water flow rate, signal alarm and shut off recirculation pump in case of reduced water flow.
    iii. (1) Flow indicator to display blow down water flow rate (local read).
    iv. (1) Flow indicating totalizer on irrigation line.
    v. (1) Lot fluid control valves and strainers.
10. Instrumentation and fluid control valves external to water panel:
    i. (2) Pitot tubes and differential pressure gauges to measure inlet airflow (local read).
    ii. (2) Differential pressure gauge to measure pressure drop across media (local read).
    iii. (1) Inlet air temperature transmitter, to signal alarm upon high temperature signal.
    iv. (2) Media temperature gauges (local read).
    v. (1) Lot fluid control valves and strainers.
11. (1) 60ft high, 50" diameter 304SS self supporting stack with two beach openings (Concrete foundation for stack by Contractor; stack to be shipped in two pieces due to height; on-site assembly by Contractor).
12. Engineering Submittal Packages.
13. Operation and Maintenance Manuals.
14. Field Services will consist of five (5) days (2 trips) for system commissioning and operator training.

Biofilter Odor Control BUDGET PROPOSAL
Harvest Power Orlando – 12-6001

The following items listed are to be supplied by the Contractor and are not in the Manufacturer's Scope of Supply.

1. Provide all equipment offloading, temporary storage and placement.
2. Provide labour, materials and equipment for the installation and assembly of all Biorem supplied equipment and instrumentation. Supply and install all other materials or equipment required for a complete operational system.
3. Site preparation and clearing of materials.
4. Design and supply an appropriately sized concrete basin as per design criteria. Provide collection and analysis of any geo-technical data as required.
5. Supply and install all required protective coatings or paint such as UV paint for piping or concrete paint.
6. Supply and install hollowcore roof membrane and rock ballast. Supply and install grouting, hangers and all other installation hardware or materials required for hollowcore roof panels.
7. Supply and install all external water piping and drain piping to and from the odor control vessel, water panel, fan and other fluid equipment including heat tracing, insulation, piping supports, drainage traps where necessary and / or UV protective paint. Drainage ports for system ducting and exhaust stack with traps and winterization as required. If winterizing system, contractor to insulate differential pressure gauge enclosures, with polytubing installed in electrical conduit, which is to be heat-traced and insulated.
8. Supply and install air ductwork to and from the odor control system including exhaust stack, flexible connectors, interconnecting ducting, manual or actuated dampers, filters, insulation and piping supports, unless otherwise indicated above.
9. Supply and install all hardware, supports, guide wires, duct gaskets, expansion joints and connectors needed for a complete and operational system.
10. Supply make-up water at a minimum pressure of 40 psi. Water analysis for hardness or other parameters as necessary.
11. Provide main electrical service and system field wiring outside the main biofilter control panel. All electrical requirements for heat tracing and equipment not specifically provide by Biorem to be provided by others.
12. Provide duct balancing, and system functional, hydrostatic, vibration and performance testing to be conducted by OTHERS as may be specified.

StormFisher London Project Contaminant Assumptions

Reception Zone A, B and C – Mixed organics

Compound	**Range**
Ammonia	10 - 20 ppm
Trimethylamine	0.005 – 1.0 mg/m3
Triethylamine	0.02 – 1.0 mg/m3
Hydrogen Sulphide	0 – 4 ppm
Methyl Mercaptan	0.05 – 0.2 ppm
Ethyl Mercaptan	0.05 -0.2 ppm
Dimethyl Sulphide	0.05 – 0.3 ppm
Dimethyl Disulphide	0.1 – 0.3 ppm
Butanol	0.002 – 10 mg/m3
Alpha-pinene	ND
Limonene	ND – 10.5 mg/m3
Acetic Acid	0.3 – 5.0 mg/m3
Oleic Acid	ND – 0.05 ppm
Butyric Acid	ND – 0.05 ppm

Reception tank 1 – Manure and aerobic sludge

Compound	**Range**
Ammonia	5 – 50 ppm
Hydrogen Sulphide	2 – 10 ppm
Methyl Mercaptan	0.05 – 12 ppm
Ethyl Mercaptan	0.05 -1 ppm
Dimethyl Sulphide	0.05 – 10 ppm
Dimethyl Disulphide	0.1 – 7 ppm

Reception tank 2 – mixed organics

Compound	**Range**
Ammonia	5 – 50 ppm
Trimethylamine	0.005 – 3.46 mg/m3
Triethylamine	0.02 – 5.02 mg/m3
Hydrogen Sulphide	0 – 10 ppm
Methyl Mercaptan	0.05 – 12 ppm
Ethyl Mercaptan	0.05 -1 ppm

Dimethyl Sulphide	0.05 – 10 ppm
Dimethyl Disulphide	0.1 – 7 ppm
Butanol	0.002 – 45.6 mg/m3
Cyclopentanol	ND – 23.5 mg/m3
Propylacetate	ND – 11.2 mg/m3
Propylbutyrat	ND – 22.4 mg/m3
Pentanone	0.05 – 4.67 mg/m3
Me-isobutylketone	0.003 – 33.7 mg/m3
Nonanal	ND – 12.5 mg/m3
Alpha-pinene	0.05 – 3 ppm
Limonene	ND – 25.9 mg/m3
Acetic Acid	0.3 – 56 mg/m3
Oleic Acid	ND – 1 ppm
Butyric Acid	ND – 2 ppm

Reception tank 3 – DAF, blood and other slaughterhouse wastes

Compound	**Range**
Ammonia	10 – 100 ppm
Trimethylamine	0.005 – 1.0 mg/m3
Triethylamine	0.02 – 2.0 mg/m3
Hydrogen Sulphide	0 – 10 ppm
Methyl Mercaptan	0.05 – 5 ppm
Ethyl Mercaptan	0.05 -1 ppm
Dimethyl Sulphide	0.05 – 5 ppm
Dimethyl Disulphide	0.1 – 4 ppm
Oleic Acid	ND – 1 ppm
Butyric Acid	ND – 2 ppm

Digestate management building and dryer air

Compound	**Concentration (ppm)**
Hydrogen Sulphide	0.186
Ammonia	0.005
Carbonyl Sulphide	0.015
Methyl Mercaptan	0.157
Ethyl Mercaptan	0.001
Dimethyl Disulphide	0.003
Dimethyl Sulphide	0.002
Carbon Disulphide	0.020
Methane	0.057
Acetaldehyde	0.135

Isobutyraldehyde	0.010
Isovaleraldehyde	0.186
Methyl Alcohol	0.015
Ethyl Alcohol	0.157
Isopropyl Alcohol	0.001
Toluene	0.003

Note: These values are from municipal biosolids

Note: The values presented in this document are from a variety of sources, including literature and from operating systems. They are highly variable and are impacted by ventilation rates, type and age of raw materials.

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [2]
Emergency Flare

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☒ 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).

☐ 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.

☐ 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:
Emergency Flare

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**June 1, 2012**	**April 15, 2013**	**49**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

Emergency flare will typically only operate when the generators are not operating and biogas must be removed from the biogas storage and treatment train.

EMISSIONS UNIT INFORMATION
Section [2]
Emergency Flare

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Flaring**
2. Control Device or Method Code: **023**

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: **36** million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **52** weeks/year	 **7** days/week **8,760** hours/year
6. Operating Capacity/Schedule Comment:	

EMISSIONS UNIT INFORMATION
Section [2]
Emergency Flare

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **Emergency Flare**	2. Emission Point Type Code: **1**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **24** feet	7. Exit Diameter: **0.67** feet
8. Exit Temperature: **900-1200**°F	9. Actual Volumetric Flow Rate: **3,454** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:		

EMISSIONS UNIT INFORMATION
Section [2]
Emergency Flare

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Waste Disposal; Solid Waste Disposal – Industrial; Liquid Waste; Sludge Digester Gas Flare**		
2. Source Classification Code (SCC): **5-03-007-89**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **0.062**	5. Maximum Annual Rate: **54.9**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **581.4**
10. Segment Comment: **Heat content based on 1,020 Btu/scf x 57-percent methane. Maximum hourly rate based on 36 MMBtu/hr. Maximum annual rate based on 10 percent of annual biogas production rate.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

EMISSIONS UNIT INFORMATION
Section [2]
Emergency Flare

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
GHGs			NS
CO2e			NS
CO			NS
VOC	023		NS
NOx			NS
SO2			NS
H2S	023		NS
PM			NS
PM10			NS
PM2.5			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **GHGs**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1,642** lb/hour **728** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-2** Reference: **See Appendix A, Table A-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-2 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO2e**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2,299** lb/hour **1,020** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-2** Reference: **See Appendix A, Table A-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-2 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **13.32** lb/hour **5.91** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-2** Reference: **See Appendix A, Table A-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-2 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **5.04** lb/hour **2.24** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-2** Reference: **See Appendix A, Table A-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-2 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOx**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2.88** lb/hour **1.28** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-2** Reference: **See Appendix A, Table A-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-2 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **35.14** lb/hour **15.59** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-2** Reference: **See Appendix A, Table A-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-2 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H2S**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.38** lb/hour **0.17** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-2** Reference: **See Appendix A, Table A-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-2 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.47** lb/hour **0.21** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-2** Reference: **See Appendix A, Table A-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-2 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.47** lb/hour **0.21** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **100-percent of PM** Reference: **Conservative Assumption**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **Hourly: 0.47 lb/hr PM x 100% = 0.47 lb/hr PM10** **Annual: 0.21 TPY x 100% = 0.21 TPY PM10**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM2.5**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.47** lb/hour **0.21** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **100-percent of PM** Reference: **Conservative Assumption**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **Hourly: 0.47 lb/hr PM x 100% = 0.47 lb/hr PM2.5** **Annual: 0.21 TPY x 100% = 0.21 TPY PM2.5**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9**	
5. Visible Emissions Comment: **General visible emissions limitation based on Rule 62-296.320(4)(b)1, F.A.C. There is no testing requirement imposed by the rule.**	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

EMISSIONS UNIT INFORMATION
Section [2]
Emergency Flare

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **HP-FI-C2** ☐ Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **HP-EU2-I2** ☐ Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **HP-EU2-I3** ☐ Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   ☐ Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   ☐ To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   ☒ Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: **Part B** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☒ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: _____
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: _____ ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☐ Not Applicable

Additional Requirements Comment

ATTACHMENT HP-EU2-I2

FUEL ANALYSIS OR SPECIFICATION

ATTACHMENT HP-EU2-I2

FUEL ANALYSIS

Fuel	Density (lb/gal)	Moisture (%)	Weight % Sulfur	Weight % Nitrogen	Weight % Ash	Heat Capacity
Biogas	–	–	0.036 [a]	--	–	570 – 592.8 Btu/scf [b]

[a] Based on 3,000 ppmvd H_2S content.

[b] Based on 57-percent methane content in biogas.

ATTACHMENT HP-EU2-I3

DETAILED DESCRIPTION OF CONTROL EQUIPMENT

OPEN FLARE

Ring Power proposes to provide a unitized, modular, digester gas utility flare, with off-loading and installation by others. The flare shall be sized per your request for quotation to handle **1200 SCFM**. The minimum flow rate is 120 SCFM. There is a manually adjustable orifice that will need to be adjusted to achieve the 1200-120 SCFM turndown.

All Digester Gas Wetted materials are 304L SS.

Not included in this proposal are the following:

- Off-loading or Installation
- Shipping or Freight Costs
- Site civil or structural engineering
- Bonds or liquidated damages

The Utility Flare shall include:

- PEI 8" Candlestick flare assembly for 120 to 1200 SCFM LFG (manual impinger (turbulator) adjustment needed to achieve full turndown) Adjustment can be made from ground level.
- 8" schedule 40 **carbon steel** lower mast assembly
- 10" schedule 8 stainless steel upper mast assembly
- 8" IPS – ANSI 125# flanged Inlet Nozzle
- Stainless steel flare shroud assembly w/ operator adjustable air inlet louvers
- Stainless steel **main** burner nozzle assembly w/ **manually adjustable** turbulator vanes
- Propane pilot assembly, including, ignitor, solenoid, regulator & manometer port Propane and propane storage supplied by others
- All flare wiring pre-installed and pre-conduited
- Type "K" flame monitoring thermocouple assembly
- **8" all aluminum flame arrester**
- **8" butterfly valve w/pneumatically controlled safety shutoff actuator w/spring assisted shutoff.**
- Differential pressure gauge across flame arrester

- All "on flare" flare wiring pre-installed and pre-conduited to a junction box. Will require field reconnection of numbered wires to numbered terminals in junction box(s).

The Utility Flare Control System shall include:

- NEMA12 control panel w/ NEMA 4 gasketing & 3 point latching
- NEMA 3/3R Weather / Heat radiation protection
- Control panel lighting
- PLC digital and analog logical supervision system
  -Honeywell Flame Switch and Amplifier
  -Temperature control
  -Flow control
  -Standard enclosed flare safeties and interlocks
- Touch Screen operator interface system
- Alarm and shutdown message annunciation (Touch Screen)
- OFF/ON switch for the System
- OPEN / CLOSED / AUTO switch for the safety shutdown valve
- TEST / OFF / AUTO switch for the propane pilot ignition system
- Flame failure annunciation for the flare (Touch Screen)
- Shutdown Valve failure annunciation (Touch Screen) for LFG system
- Low LFG flow rate annunciation (Touch Screen)
- Flame failure reset (ALARM RESET / LAMP TEST switch)
- 120V 60 HZ Electrical service required, 30 AMPS.
- AC and DC control voltage surge protection

General:

- 3 days of on-site start-up & training services by a factory field services technician/engineer are included. To be accomplished in one trip

The pricing does not include any site civil or structural engineering, or site preparation work of any kind. **Neither does the price include any local, state or federal taxes, or any permits, duties or tariffs of any kind.**

The system as quoted is to be off loaded, set in place, installed and interconnected by others. The system is designed for installation on equipment pad(s) installed at the same finished elevation.

We anticipate that we could deliver the system in **16** to **18** weeks from receipt of approved submittals or other irrevocable release to order all materials. Actual shipping estimates will have to be given at time of order. We anticipate that submittals can be provided in **3** to **4** weeks from receipt of an approved order.

PEI PERENNIAL ENERGY

Equipment Data Sheet

Spec #: P1217
Sheet #: 1 of 1
By: BLA
Date: 14-Mar-2012

8" Candlestick Flare

Reference Designator or Item #: FLR-301 — Generic

Quantity	1	
Manufacturer or Approved EqualModel #	Perennial Energy, Inc.	West Plains, MO 65775 USA
Capacity	36.0 MMBtu/hr	
Turndown Ratio	10 : 1	
Design LFG Energy Density	500 Btu/ft^3	
Design Criteria	EPA-- 40CFR, Section 60.18	
Theoretical NMOC Destruction Efficiency	≥98%	Per EPA-CICA Fact Sheet
Theoretical Maximum Emissions (NOx / CO)	0.08 lb/MMBtu / 0.37 lb/MMBtu	
Design Heat Flux	600 Btu/hr-ft^2	
Flame Presence Monitoring	Yes	Thermocouple, Type "K"
Burner Tip O.D. / I.D. (Inches)	8.825 / 7.981	
Overall Flare Height	24 Feet	
Inlet Pipe Size (IPS)	8 Inch	
Flare Mast Pipe Size (IPS)	8 Inch	
Burner Nozzle Size (IPS / Schedule)	8 " Sch 40	
Burner Nozzle Size, O.D./I.D. (inches)	8.825 / 7.981	
Max Nozzle Velocity	3454 std. ft/min	
Fuel Gas Nozzle Adjustment	Yes	Manual
Wind Shroud Air Inlet Adjustment	Yes	Manual
Wind Shroud Diameter, O.D./I.D. (inches)	36 / 34.5	Height = 48 Inches
Wind Shrould Insulation	2 " of Ceramic Fiber Blanket	8 lb/ft^3 Density
Insulation Attachment	Inconel Studs & Retainers	
Insulations Layers	2	
Wind Shroud -- Construction Material	304L/316L Stainless Steel	ASTM A240 / ASME SA240
Flare Burner -- Construction Material	304L/316L Stainless Steel	ASTM A312
Flare Mast -- Construction Material	Carbon Steel Pipe	ASTM A53
Self Supporting Base	Yes	ASTM A36
Other Flare Equipment		
Flame Arrester	Varec 8 Inch	All Aluminum
Safety Shutdown Valve (SSV)	Pneumatic 8 Inch	SS Disc & Trim w/ Buna N Elastomer
SSV Power Source	Compressed Air	By Others
Supplied with Additional Equipment ?	No	
Structural Design Criteria	UBC 100 mph & Seismic Zone 4 *	

NOTES:
Flare is designed for gas flow rate of 120 to 1200 SCFM.
Utility Flare combustion temperature measures between 900 and 1200 deg F depending on flow and wind conditions

* When properly attached to an appropriately designed and constructed concrete equipment pad

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [3]
Power Generation / Heat Recovery

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☒ 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).

☐ 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.

☐ 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:
Power Generation / Heat Recovery

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**June 1, 2012**	**April 15, 2013**	**49**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

9. Package Unit:
Manufacturer: **Caterpillar** Model Number: **3520C**

10. Generator Nameplate Rating: **3.2** MW

11. Emissions Unit Comment:

Consists of two (2) 1.6-MW combined heat and power generators, as well as heat recovery system for process heat and heat for drying fertilizer product. See Attachment HP-EU3-A11 for manufacturer engine technical data sheet.

EMISSIONS UNIT INFORMATION
Section [3]
Power Generation / Heat Recovery

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: **36.46** million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **52** weeks/year	**7** days/week **8,760** hours/year
6. Operating Capacity/Schedule Comment: **Each generator has a maximum heat input rate of 18.23 MMBtu/hr.**	

EMISSIONS UNIT INFORMATION
Section [3]
Power Generation / Heat Recovery

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **CHP1 and CHP2**		2. Emission Point Type Code: **2**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **18.25** feet	7. Exit Diameter: **1.33** feet
8. Exit Temperature: **915**°F	9. Actual Volumetric Flow Rate: **12,309** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: **Actual volumetric flow rate is for one of two generators.**		

EMISSIONS UNIT INFORMATION
Section [3]
Power Generation / Heat Recovery

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Internal Combustion Engines; Electric Generation; Process Gas; Reciprocating**		
2. Source Classification Code (SCC): **2-01-007-02**	3. SCC Units: **Million Standard Cubic Feet**	
4. Maximum Hourly Rate: **0.063**	5. Maximum Annual Rate: **549.30**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **581.4**
10. Segment Comment: **Heat content based on 1,020 Btu/scf x 57-percent methane. Maximum hourly rate based on combined heat input rate of 36.46 MMBtu/hr for two generators.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
GHGs			NS
CO2e			NS
CO			EL
NOx			EL
VOC			EL
Formaldehyde – H095			NS
HAPS			NS
SO2			NS
PM			NS
PM10			NS
PM2.5			NS
H2S			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **GHGs**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **10,358** lb/hour **45,370** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-3** Reference: **See Appendix A, Table A-3**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-3 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO2e**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **10,504** lb/hour **46,007** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See Appendix A, Table A-3** Reference: **See Appendix A, Table A-3**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Appendix A, Table A-3 for calculations of emissions.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **49.43** lb/hour **216.49** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **5.0 g/bhp-hr** Reference: **NSPS 40 CFR 60 Subpart JJJJ**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 5.0 g/bhp-hr x 2,242 bhp x 1 lb/453.5924 g x 2 engines = 49.43 lb/hr

Annual: 49.43 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 216.49 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **1**

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **5.0 g/bhp-hr**	4. Equivalent Allowable Emissions: **49.43** lb/hour **216.49** tons/year
5. Method of Compliance: **Manufacturer Certification**	
6. Allowable Emissions Comment (Description of Operating Method): **40 CFR 60 Subpart JJJJ**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOx**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **19.77** lb/hour **86.60** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **2.0 g/bhp-hr** Reference: **NSPS 40 CFR 60 Subpart JJJJ**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 2.0 g/bhp-hr x 2,242 bhp x 1 lb/453.5924 g x 2 engines = 19.77 lb/hr

Annual: 19.77 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 86.60 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **2.0 g/bhp-hr**	4. Equivalent Allowable Emissions: **19.77** lb/hour **86.60** tons/year
5. Method of Compliance: **Manufacturer Certification**	
6. Allowable Emissions Comment (Description of Operating Method): **40 CFR 60 Subpart JJJJ**	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **9.89** lb/hour **43.30** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **1.0 g/bhp-hr** Reference: **NSPS 40 CFR 60 Subpart JJJJ**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 0.80 g/bhp-hr x 2,242 bhp x 1 lb/453.5924 g x 2 engines = 9.89 lb/hr

Annual: 9.89 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 43.30 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **1.0 g/bhp-hr**	4. Equivalent Allowable Emissions: **9.89** lb/hour **43.30** tons/year
5. Method of Compliance: **Manufacturer Certification**	
6. Allowable Emissions Comment (Description of Operating Method): **40 CFR 60 Subpart JJJJ**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H095**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **4.35** lb/hour **19.05** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.44 g/bhp-hr** Reference: **CAT Engine Technical Data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 0.44 g/bhp-hr x 2,242 bhp x 1 lb/453.5924 g x 2 engines = 4.35 lb/hr

Annual: 4.35 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 19.05 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **HAPS**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **4.35** lb/hour **19.05** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.44 g/bhp-hr** Reference: **CAT Engine Technical Data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 0.44 g/bhp-hr x 2,242 bhp x 1 lb/453.5924 g x 2 engines = 4.35 lb/hr

Annual: 4.35 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 19.05 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2.04** lb/hour **8.94** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **200 ppmvd H2S, 98% Destruction** Reference: **Maximum H2S concentration to CHP Engines**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly:
200/10^6 x 60 min/hr x 2116.8/1545.6 x 1/528°R x 522.5 scf/min x 34 lb H2S/lbmol x 64 lb SO2/32 lb H2S x 98-percent destruction x 2 engines = 2.04 lb/hr

Annual: 2.04 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 8.94 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.48** lb/hour **2.09** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.0131 lb/MMBtu** Reference: **AP-42, Table 1.4-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 0.0131 lb/MMBtu x 18.23 MMBtu/hr x 2 engines = 0.48 lb/hr

Annual: 0.48 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 2.09 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.48** lb/hour **2.09** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **100 percent of PM** Reference: **Conservative Assumption**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **Hourly: 0.48 lb/hr x 100% = 0.48 lb/hr PM10** **Annual: 0.48 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 2.09 TPY**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM2.5**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.48** lb/hour **2.09** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **100 percent of PM** Reference: **Conservative Assumption**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 0.48 lb/hr x 100% = 0.48 lb/hr PM2.5

Annual: 0.48 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 2.09 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H2S**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.022** lb/hour **0.097** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **200 ppmvd H2S, 98% Destruction** Reference: **Maximum H2S concentration to CHP Engines**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly:
200/10^6 x 60 min/hr x 2116.8/1545.6 x 1/528°R x 522.5 scf/min x 34 lb H2S/lbmol x (1 – 98-percent destruction) x 2 engines = 2.04 lb/hr

Annual: 2.04 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 8.94 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation **1** of **1**

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9**	
5. Visible Emissions Comment: **General visible emissions limitation based on Rule 62-296.320(4)(b)1, F.A.C. There is no testing requirement imposed by the rule.**	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

EMISSIONS UNIT INFORMATION
Section [3]
Power Generation / Heat Recovery

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: HP-FI-C2 ☐ Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: HP-EU3-I2 ☐ Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☒ Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: Part B ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☒ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: _____
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: _____ ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☐ Not Applicable

Additional Requirements Comment

ATTACHMENT HP-EU3-A11

MANUFACTURER ENGINE TECHNICAL DATA SHEET

G3520C

GAS ENGINE TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1200	FUEL:	Low Energy
COMPRESSION RATIO:	11.3	FUEL SYSTEM:	CAT LOW PRESSURE
AFTERCOOLER - STAGE 2 INLET (°F):	130		WITH AIR FUEL RATIO CONTROL
AFTERCOOLER - STAGE 1 INLET (°F):	217	FUEL PRESSURE RANGE(psig):	1.5-5.0
JACKET WATER OUTLET (°F):	230	FUEL METHANE NUMBER:	140
ASPIRATION:	TA	FUEL LHV (Btu/scf):	500
COOLING SYSTEM:	JW+1AC, OC+2AC	ALTITUDE CAPABILITY AT 77°F INLET AIR TEMP. (ft):	2887
IGNITION SYSTEM:	ADEM3	APPLICATION:	Genset
EXHAUST MANIFOLD:	DRY	POWER FACTOR:	0.8
COMBUSTION:	Low Emission	VOLTAGE(V):	480-4160
NOx EMISSION LEVEL (g/bhp-hr NOx):	1.0		

RATING		NOTES	LOAD	100%	75%	50%
GENSET POWER	(WITHOUT FAN)	(1)(2)	ekW	1600	1200	800
GENSET POWER	(WITHOUT FAN)	(1)(2)	KVA	2000	1500	1000
ENGINE POWER	(WITHOUT FAN)	(2)	bhp	2242	1683	1128
GENERATOR EFFICIENCY		(1)	%	95.7	95.6	95.1
GENSET EFFECIENCY	(ISO 3046/1)	(3)	%	39.2	37.5	36.6
GENSET EFFECIENCY	(NOMINAL)	(3)	%	38.3	36.6	35.7
ENGINE EFFICIENCY	(NOMINAL)	(3)	%	40.0	38.3	37.6
THERMAL EFFICIENCY	(NOMINAL)	(4)	%	39.9	39.9	41.6
TOTAL EFFICIENCY	(NOMINAL)	(5)	%	78.2	76.5	77.3
ENGINE DATA						
GENSET FUEL CONSUMPTION	(ISO 3046/1)	(6)	Btu/ekW-hr	8697	9100	9320
GENSET FUEL CONSUMPTION	(NOMINAL)	(6)	Btu/ekW-hr	8910	9322	9547
ENGINE FUEL CONSUMPTION	NOMINAL	(6)	Btu/bhp-hr	6358	6646	6771
AIR FLOW (77°F, 14.7 psia)	(WET)	(7)	scfm	4248	3222	2242
AIR FLOW	(WET)	(7)	lb/hr	18836	14288	9940
COMPRESSOR OUT PRESSURE			in Hg(abs)	104.1	77.8	53.5
COMPRESSOR OUT TEMPERATURE			°F	369	295	212
AFTERCOOLER AIR OUT TEMPERATURE			°F	140	137	136
INLET MAN. PRESSURE		(8)	in Hg(abs)	89.7	68.3	48.4
INLET MAN. TEMPERATURE	(MEASURED IN PLENUM)	(9)	°F	140	137	136
TIMING		(10)	°BTDC	28	28	28
EXHAUST TEMPERATURE - ENGINE OUTLET		(11)	°F	915	958	982
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(12)	ft3/min	12309	9663	6823
EXHAUST GAS MASS FLOW	(WET)	(12)	lb/hr	20951	15948	11073
MAX INLET RESTRICTION		(13)	in H2O	10.04	10.04	10.04
MAX EXHAUST RESTRICTION		(13)	in H2O	20.07	20.07	20.07
EMISSIONS DATA - ENGINE OUT						
NOx (as NO2)		(14)(15)	g/bhp-hr	1.00	1.00	1.00
CO		(14)(16)	g/bhp-hr	4.78	4.88	4.97
THC (mol. wt. of 15.84)		(14)(16)	g/bhp-hr	5.36	6.07	7.34
NMHC (mol. wt. of 15.84)		(14)(16)	g/bhp-hr	0.80	0.91	1.10
NMNEHC (VOCs) (mol. wt. of 15.84)		(14)(16)(17)	g/bhp-hr	0.54	0.61	0.73
HCHO (Formaldehyde)		(14)(16)	g/bhp-hr	0.44	0.44	0.49
CO2		(14)(16)	g/bhp-hr	736	765	806
EXHAUST OXYGEN		(14)(18)	% DRY	8.4	8.1	8.0
LAMBDA		(14)(18)		1.64	1.58	1.61
ENERGY BALANCE DATA						
LHV INPUT		(19)	Btu/min	237589	186442	127298
HEAT REJECTION TO JACKET WATER (JW)		(20)(27)	Btu/min	29397	25887	21531
HEAT REJECTION TO ATMOSPHERE		(21)	Btu/min	7210	6013	4823
HEAT REJECTION TO LUBE OIL (OC)		(22)(28)	Btu/min	7791	6995	6197
HEAT REJECTION TO EXHAUST (LHV TO 77°F)		(23)	Btu/min	75835	63569	41405
HEAT REJECTION TO EXHAUST (LHV TO 350°F)		(23)	Btu/min	53213	43777	31605
HEAT REJECTION TO A/C - STAGE 1 (1AC)		(24)(27)	Btu/min	12077	4700	-241
HEAT REJECTION TO A/C - STAGE 2 (2AC)		(25)(28)	Btu/min	8222	5917	3767
PUMP POWER		(26)	Btu/min	1977	1977	1977

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1. (Standard reference conditions of 77°F, 29.60 in Hg barometric pressure, 500 ft. altitude.) No overload permitted at rating shown. Consult altitude curves for applications above maximum rated altitude and/or temperature.

Emission levels are at engine exhaust flange prior to any after treatment. Values are based on engine operating at steady state conditions, adjusted to the specified NOx level at 100% load. Tolerances specified are dependent upon fuel quality. Fuel methane number cannot vary more than ± 3.

For notes information consult page three.

FUEL USAGE GUIDE

CAT METHANE NUMBER	110	120	130	140	150
SET POINT TIMING	-	24	26	28	30
DERATION FACTOR	0	1	1	1	1

ALTITUDE DERATION FACTORS AT RATED SPEED

INLET AIR TEMP °F	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.74	0.72	0.69	0.66	0.63
120	1	1	0.96	0.92	0.89	0.85	0.82	0.79	0.76	0.73	0.70	0.67	0.64
110	1	1	0.98	0.94	0.90	0.87	0.84	0.80	0.77	0.74	0.71	0.68	0.66
100	1	1	0.99	0.96	0.92	0.88	0.85	0.82	0.79	0.75	0.72	0.70	0.67
90	1	1	1	0.97	0.94	0.90	0.87	0.83	0.80	0.77	0.74	0.71	0.68
80	1	1	1	0.99	0.95	0.92	0.88	0.85	0.81	0.78	0.75	0.72	0.69
70	1	1	1	1	0.97	0.93	0.90	0.86	0.83	0.80	0.77	0.73	0.70
60	1	1	1	1	0.99	0.95	0.92	0.88	0.85	0.81	0.78	0.75	0.72
50	1	1	1	1	1	0.97	0.93	0.90	0.86	0.83	0.80	0.76	0.73

ALTITUDE (FEET ABOVE SEA LEVEL)

AFTERCOOLER HEAT REJECTION FACTORS (ACHRF)

INLET AIR TEMP °F	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.33	1.38	1.43	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
120	1.26	1.31	1.36	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
110	1.20	1.24	1.29	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
100	1.13	1.18	1.22	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27
90	1.06	1.11	1.16	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
80	1	1.04	1.09	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
70	1	1	1.02	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
60	1	1	1	1	1	1	1	1	1	1	1	1	1
50	1	1	1	1	1	1	1	1	1	1	1	1	1

ALTITUDE (FEET ABOVE SEA LEVEL)

FUEL USAGE GUIDE:

This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

ALTITUDE DERATION FACTORS:

This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site.

ACTUAL ENGINE RATING:

To determine the actual rating of the engine at site conditions, one must consider separately, limitations due to fuel characteristics and air system limitations. The Fuel Usage Guide deration establishes fuel limitations. The Altitude/Temperature deration factors and RPC (reference the Caterpillar Methane Program) establish air system limitations. RPC comes into play when the Altitude/Temperature deration is less than 1.0 (100%). Under this condition, add the two factors together. When the site conditions do not require an Altitude/Temperature derate (factor is 1.0), it is assumed the turbocharger has sufficient capability to overcome the low fuel relative power, and RPC is ignored. To determine the actual power available, take the lowest rating between 1) and 2).

1) Fuel Usage Guide Deration
2) 1-((1-Altitude/Temperature Deration) + (1-RPC))

AFTERCOOLER HEAT REJECTION FACTORS(ACHRF):

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft. altitude. To maintain a constant air inlet manifold temperature, as the inlet air temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor (ACHRF) to adjust for inlet air temp and altitude conditions. See Notes 27 and 28 below for application of this factor in calculating the heat exchanger sizing criteria. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail.

NOTES:

1. Generator efficiencies, power factor, and voltage are based on standard generator. [Genset Power (ekW) is calculated as: Engine Power (bkW) x Generator Efficiency]. [Genset Power (kVA) is calculated as: Engine Power (bkW) x Generator Efficiency / Power Factor]
2. Rating is with two engine driven water pumps. Tolerance is (+)3, (-)0% of full load.
3. ISO 3046/1 Genset efficiency tolerance is (+)0, (-)5% of full load % efficiency value. Nominal genset and engine efficiency tolerance is ± 2.5% of full load % efficiency value.
4. Thermal Efficiency is calculated as: (Heat rejection to jacket water + Heat Rejection to A/C Stage 1 + Heat rejection to exhaust to 350°F) / LHV Input
5. Total efficiency is calculated as: Genset Efficiency + Thermal Efficiency. Tolerance is ±10% of full load data.
6. ISO 3046/1 Genset fuel consumption tolerance is (+)5, (-)0% of full load data. Nominal genset and engine fuel consumption tolerance is ± 2.5% of full load data.
7. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.
8. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.
9. Inlet manifold temperature is a nominal value with a tolerance of ± 9°F.
10. Timing indicated is for use with the minimum fuel methane number specified. Consult the appropriate fuel usage guide for timing at other methane numbers.
11. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.
12. Exhaust flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 6 %.
13. Inlet and Exhaust Restrictions are maximum allowed values at the corresponding loads. Increasing restrictions beyond what is specified will result in a significant engine derate.
14. Emissions data is at engine exhaust flange prior to any after treatment.
15. NOx tolerances are ± 18% of specified value.
16. CO, CO2, THC, NMHC, NMNEHC, and HCHO values are "Not to Exceed" levels. THC, NMHC, and NMNEHC do not include aldehydes.
17. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ
18. Exhaust Oxygen tolerance is ± 0.5; Lambda tolerance is ± 0.05. Lambda and Exhaust Oxygen level are the result of adjusting the engine to operate at the specified NOx level.
19. LHV rate tolerance is ± 2.5%.
20. Heat rejection to jacket water value displayed includes heat to jacket water alone. Value is based on treated water. Tolerance is ± 10% of full load data.
21. Heat rejection to atmosphere based on treated water. Tolerance is ± 50% of full load data.
22. Lube oil heat rate based on treated water. Tolerance is ± 20% of full load data.
23. Exhaust heat rate based on treated water. Tolerance is ± 10% of full load data.
24. Heat rejection to A/C - Stage 1 based on treated water. Tolerance is ±5% of full load data.
25. Heat rejection to A/C - Stage 2 based on treated water. Tolerance is ±5% of full load data.
26. Pump power includes engine driven jacket water and aftercooler water pumps. Engine brake power includes effects of pump power.
27. Total Jacket Water Circuit heat rejection is calculated as: (JW x 1.1) + (1AC x 1.05) + [0.9 x (1AC + 2AC) x (ACHRF - 1) x 1.05]. Heat exchanger sizing criterion is maximum circuit heat rejection at site conditions, with applied tolerances. A cooling system safety factor may be multiplied by the total circuit heat rejection to provide additional margin.
28. Total Second Stage Aftercooler Circuit heat rejection is calculated as: (OC x 1.2) + (2AC x 1.05) + [(1AC + 2AC) x 0.1 x (ACHRF - 1) x 1.05]. Heat exchanger sizing criterion is maximum circuit heat rejection at site conditions, with applied tolerances. A cooling system safety factor may be multiplied by the total circuit heat rejection to provide additional margin.

FREE FIELD MECHANICAL & EXHAUST NOISE

MECHANICAL: Sound Power (1/3 Octave Frequencies)

Gen Power Without Fan	Percent Load	Engine Power	Overall	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz
ekW	%	bhp	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1600	100	2242	116.6	77.2	87.0	87.7	90.3	96.5	98.1	98.9	101.2	93.8	102.6
1200	75	1683	115.5	76.3	84.2	84.9	88.9	93.3	97.2	94.3	99.0	92.5	100.8
800	50	1128	113.7	73.8	81.0	80.4	87.2	90.5	93.2	92.4	98.1	90.5	99.6

MECHANICAL: Sound Power (1/3 Octave Frequencies)

Gen Power Without Fan	Percent Load	Engine Power	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
ekW	%	bhp	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1600	100	2242	107.9	105.6	108.6	105.5	103.2	102.6	101.3	101.0	101.1	106.1	109.8
1200	75	1683	107.9	103.4	105.7	104.3	101.2	101.1	100.1	100.1	100.7	110.6	99.2
800	50	1128	108.2	101.3	104.2	105.6	99.7	100.1	98.8	98.9	102.7	98.0	95.2

EXHAUST: Sound Power (1/3 Octave Frequencies)

Gen Power Without Fan	Percent Load	Engine Power	Overall	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz
ekW	%	bhp	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1600	100	2242	117.6	107.2	98.1	98.0	88.1	106.8	97.7	106.0	100.2	94.2	102.5
1200	75	1683	117.1	106.8	96.7	96.0	92.9	110.8	99.0	105.5	97.8	95.8	102.1
800	50	1128	114.8	106.3	95.0	93.9	89.4	108.0	96.1	101.8	94.2	94.8	98.8

EXHAUST: Sound Power (1/3 Octave Frequencies)

Gen Power Without Fan	Percent Load	Engine Power	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
ekW	%	bhp	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1600	100	2242	100.4	102.1	101.7	101.9	104.9	106.9	107.2	107.4	105.8	104.7	107.9
1200	75	1683	97.9	100.9	101.6	98.9	103.0	105.2	105.9	106.6	105.3	101.0	105.8
800	50	1128	94.7	97.6	98.5	95.1	101.0	103.9	103.9	103.9	101.3	101.5	100.8

SOUND PARAMETER DEFINITION:

Sound Power Level Data - DM8702-01

Sound power is defined as the total sound energy emanating from a source irrespective of direction or distance. Sound power level data is presented under two index headings:
Sound power level -- Mechanical
Sound power level -- Exhaust

Mechanical: Sound power level data is calculated in accordance with ISO 6798. The data is recorded with the exhaust sound source isolated.

Exhaust: Sound power level data is calculated in accordance with ISO 6798 Annex A.

Measurements made in accordance with ISO 6798 for engine and exhaust sound level only. No cooling system noise is included unless specifically indicated. Sound level data is indicative of noise levels recorded on one engine sample in a survey grade 3 environment.

How an engine is packaged, installed and the site acoustical environment will affect the site specific sound levels. For site specific sound level guarantees, sound data collection needs to be done on-site or under similar conditions.

ATTACHMENT HP-EU3-I2

FUEL ANALYSIS OR SPECIFICATION

ATTACHMENT HP-EU3-I2

FUEL ANALYSIS

Fuel	Density (lb/gal)	Moisture (%)	Weight % Sulfur	Weight % Nitrogen	Weight % Ash	Heat Capacity
Biogas	–	–	0.024 [a]	–	–	570 – 592.8 Btu/scf [b]

[a] Based on 200 ppmvd H_2S content.

[b] Based on 57-percent methane content in biogas.

PART B

Table of Contents

List of Appendices

1.0 INTRODUCTION

Harvest Power Orlando, LLC (HP) is submitting this air construction permit application for the proposed Harvest Energy Garden (HEG) to be located adjacent to the Reedy Creek (RC) Wastewater Treatment Facility in Lake Buena Vista, Orange County, Florida. The HP facility will receive food waste and other organic compounds, as well as thickened waste-activated sludge (TWAS) from RC and other sources, which will be processed via anaerobic digestion to produce biogas and fertilizer. The biogas will be burned in generators to produce electricity for sale to the grid as well as produce heat to be used in the facility.

A more detailed description of the proposed facility is presented in Section 2.0. An analysis and estimate of any air emissions is presented in Section 3.0. A summary of the facility's rule applicability analysis is presented in Section 4.0.

2.0 FACILITY DESCRIPTION

The proposed HP facility will consist of five main sections:

- Feedstock Receiving and Pre-Treatment
- Anaerobic Digestion
- Biogas, Power Generation and Heat Recovery
- Odor Removal
- Digestate Management

Waste will be brought onsite and delivered to the receiving building where it will undergo a pre-treatment process to remove contaminants (glass, metals, plastics, etc) and make it suitable for processing in the digesters. The waste slurry will then be sent to a set of two continuously stirred tank reactor (CSTR) digesters. The digesters will breakdown the organics in the slurry and convert them primarily to methane (CH_4) and carbon dioxide (CO_2).

After the digestion process has been completed, the biogas produced will be kept in an integrated gasholder until it can be used to generate heat and power. The gas will be passed through a biogas scrubber and knockout tower in order to remove hydrogen sulfide (H_2S) and water, thus making the gas suitable for combustion. The gas will be combusted in two 1.6-megawatt (MW) generators in order to produce electricity for sale to the grid and heat for use at the facility. The generator exhaust will be used to heat oil for an indirect-heated dryer in the fertilizer production portion of the facility. The generators will also be equipped with water jackets to heat water for use in the facility processes.

The remaining solids from the digestion process will be sent to the digestate handling area, where they will be sent through a centrifuge to remove water. The solids will be sent to the indirect-heated dryer where the water content will be further reduced to produce a final fertilizer product. The water off of the centrifuge will undergo additional treatment in order to make it suitable to be returned to the RC wastewater treatment plant.

Air from the receiving building as well as the digestate management area and dryer will be sent to a bio-scrubber in order to reduce the emissions of any odor producing compounds. A more detailed description of each process is given in the following sections. A process flow diagram of the facility is included in Attachment HP-FI-C2 of the application.

2.1 Feedstock Receiving and Pre-Treatment

The proposed facility is designed to process organic solid waste collected from:

- Lift station skimmings
- Wastewater system grease traps [fat, oil, grease (FOG)] and brown grease
- Institutional/Commercial/Industrial organics (i.e. food waste and food processing waste)

- Thickened waste-activated sludge (TWAS) and other forms of biosolids
- Primate manure with bedding

The organics will be received in the receiving building before being loaded into storage tanks located at the facility. In the case of organics that contain plastic and other non-organics, the waste will be fed into a separation device to remove the non-organic material prior to digestion. The non-organic material will be collected and shipped offsite to a landfill. The maximum design amount of waste material received by the facility will be the following:

- RC provided (FOG, food waste, TWAS, primate manure): 249,300 tons per year (TPY)
- Outside sources (FOG, food waste): 52,600 TPY
- Total (as solids): 301,900 TPY

The organic material will be loaded into tanks and blended with the FOG and brown grease from a separate waste reception/blending tank. The mixing tanks will be closed and made of bolted steel. TWAS from the RC belt thickeners will be sent directly to the digestion system.

Air from the receiving building and reception tanks will be vented to a bio-scrubber to reduce the emissions of odor-causing compounds. A detailed estimate of the emissions from the bio-scrubber is found in Section 3.2.

2.2 Anaerobic Digestion

As part of the anaerobic digestion process, a pair of CSTRs will be used. The CSTR system will maximize organics destruction and biogas/methane generation while minimizing digestion volume and residual digestate production requiring dewatering and disposal. Treatment performance for both chemical oxygen demand (COD) and total solids (TS) is expected to reach 85 percent with the generation of 15.6 million cubic meters per year (m^3/yr) of biogas. The exact composition of gas will be verified with extensive bench and onsite pilot testing.

The proposed anaerobic digestion/post digester system will take the combined food/FOG/manure waste from the mixing tanks through a heat exchanger to elevate the temperature to the mesophilic digester processing temperature prior to pumping the material into the CSTR anaerobic digester. Process water taken from the RC Gravity Belt Filter system will be pumped to the digester as needed to maintain a desired soluble ammonia-nitrogen level to minimize biological inhibition.

Once inside the digester tank, all the feedstock material and biological digester solids will be continuously mixed by a central, vertical agitator. During anaerobic digestion, the organic material will be biodegraded and converted into biogas with a methane concentration of approximately 57 percent. The digestate will leave the CSTR digester tank by gravity and flow into the post digester with an integrated gasholder. The

post digester will be an insulated cylindrical tank made of reinforced concrete. It will be covered with a double membrane, which will act as a gasholder. The storage capacity of the post digester will be approximately 4,200 cubic meters (m^3) of sludge and 4,000 m^3 of biogas. The post digester contents will be mixed by two low-speed lateral agitators with a motor/gear outside of the tank. The sludge level will be monitored by measuring the hydraulic pressure at the bottom of the tank.

2.3 Gasholder

The gasholder system consists of two membrane layers. The outer membrane is used as a protection membrane only. An air blower keeps the shape of this membrane stable at all times. The inner membrane is used as the gas storage membrane. It is made of a special textile double-sided polyvinyl chloride (PVC) membrane that is moving up and down in accordance with the gas filling level of the system. To avoid contact with the liquid inside the tank, a support construction is installed. To protect the system against impermissible over or under pressure, the system is equipped with a combined hydraulic over/under pressure device. Before this safety device is activated, an alarm would sound.

The level of the gasholder filling is indicated permanently by a level indicator. This signal will be used to control the gas consumers. The post digester can also be used to provide storage for excess feed stock material above digester design load capacity to avoid upset of the primary digester. Further processing of the digestate will be discussed under the digestate management module while the biogas handling is discussed under the power generation module.

2.4 Digestate Management/Fertilizer Production

Under the digestion process, a majority of the digestate from the anaerobic digester will be captured, and a solids separation device will be utilized to remove the liquid effluent for hydraulic control and recycle the active solids back to the digester for enhanced biodegradation of the feed stocks. The proposed system will use a centrifuge for solids separation with the goal of taking the solids from 6 percent to 10 percent with 95-percent capture and no polymer. The benefit of the digestate recycle of active biomass is to increase the sludge age within the digester, which will result in better treatment performance and more biogas generation.

A centrifuge will be used rather than a belt filter press since the centrifuge will be easier to run to meet the desired solids concentration of the recycle and will not require polymer, which can inhibit treatment performance, biogas generation, and mixing in the anaerobic digester. The de-watered solids will then be fed to an indirect-heated dryer that will yield a greater than 90-percent dry Class A/AA fertilizer material that will be sold by HP as a product. The dryer will receive heat through a thermal oil heating system. The oil will be heated by the exhaust gases in the power generation portion of the facility. The oil will be piped to the dryer, where it will then heat air that will enter the dryer. Emissions from the dryer will be controlled by the bio-scrubber.

Air from the digestate management building and the dryer will be vented to a bio-scrubber to reduce the emissions of odor-causing compounds. A detailed estimate of the emissions from the bio-scrubber is found in Section 3.2.

The effluent from the centrifuge will be directed to a nutrient recovery system designed to remove soluble phosphorus and nitrogen before sending the final effluent back to the RC wastewater treatment facility. A possible byproduct of the nutrient recovery system is magnesium ammonium phosphate (struvite), which can also be sold as a nutrient fertilizer.

The design production rate of the facility, based on the maximum input rate of 301,900 TPY of solids, will be the following:

- Electricity – 28,032 megawatt-hours (MWh)
- Heat – 20,300 gigajoules (GJ)
- Struvite – 835 TPY
- Solids – 9,050 TPY
- Effluent – 315,000 TPY

2.5 Power Generation

As stated previously, the proposed facility will use a CSTR anaerobic digestion process to biodegrade the organic material contained in the feed stocks and convert the organics into biogas with a methane concentration of approximately 57 percent. The design biogas generation rate is 15.6 million m^3/yr, or 8.9 million m^3/yr as methane. The biogas will be stored in a double-membrane gasholder constructed on top of the post digester. The gas-holding capacity will be sized for a residence time of 2.25 hours on average or 4,000 m^3.

From the gasholder, the biogas will be directed to an H_2S scrubber, which will reduce the H_2S concentration in the gas from approximately 3,000 parts per million (ppm) to less than 200 ppm. Particulate matter (PM) and some water vapor will also be removed as the gas passes through the condensate trap/gravel filter. After the scrubber, the gas will be piped to combined heat and power (CHP) engines that will produce power and heat.

The facility will have two 1.6-MW engines to produce the heat and power. Heat from the CHP engines will be used to provide indirect heat to further dry the final fertilizer product.

An emergency biogas flare will be included to burn off excess gas in the event that gas must be removed from the gasholder while the generators are not operating. The flare will be connected by a diverter directly to the piping from the gasholder to the CHP engines. Therefore the gas will not go through the H_2S scrubber prior to being burned in the flare.

3.0 EMISSIONS ESTIMATES

3.1 Sources of Air Emissions

Because of the nature of production of biogas from anaerobic digestions of organic solids, a majority of the process at the HP facility will be fully enclosed and sealed. Other portions of the facility will be enclosed to the extent possible, and the air inside will be sent to the bio-scrubber for odor control. For that reason, there will be very few sources of air emissions from the facility. The sources of air emissions will be:

- Bio-scrubber Stack – air from the receiving building and from the fertilizer dryer
- Emergency Flare – biogas will be burned when the CHP engines are not operating and gas must be vented from the gas holder
- CHP Engine Stacks – emissions from combustion of the biogas from two 1.6-MW engines

3.2 Bio-Scrubber Stack Emissions

A bio-scrubber will control the emissions of VOCs, HAPs, and other odor causing pollutants from a majority of the facility. The entire receiving building will be kept closed and sealed to the extent possible, and the air will be vented to the bio-scrubber. Additionally, the three holding tanks, as well as the digestate handling and drying systems will be vented to the bio-scrubber.

The bio-scrubber is expected to reduce the HAP and VOC emissions by more than 98 percent; however, as a conservative estimation for this application, it is assumed that the bio-scrubber will reduce the emissions by 90 percent.

A quote for a bio-scrubber has been included as Attachment HP-EU1-I3 of the application. The selection of the actual bio-scrubber vendor is still under consideration, but whichever bio-scrubber is selected will have equivalent or better HAP and VOC removal efficiencies. The quote contains estimates of emissions from the different sources that will be controlled by the bio-scrubber. The highest emission rates for each compound were used as the basis for the emissions estimates.

The estimated hourly and annual emission rates from the bio-scrubber are summarized in Appendix A, Table A-1.

3.3 Emergency Flare Emissions

The HP facility will install an open "candlestick" type flare as a control device for emergency periods when gas must be vented from the gas holder and the CHP engines are not operating. The short-term (hourly) emissions from the flares are based on the maximum design flow rate through the flare of 1,200 standard cubic feet per minute (scfm). The long-term (annual) emissions are based on a conservative estimate that 10 percent of the biogas produced will be sent to the flare.

Using a heating value of 1,020 British thermal units per standard cubic feet (Btu/scf), along with the methane content of 57 percent, results in a maximum heating input rate for the flare of 41.9 million British thermal units per hour (MMBtu/hr). Based on the assumption that no more than 10 percent of the biogas produced annually will be burned in the flare, it is estimated that the flare will burn no more than 1.6 million m^3/yr of biogas [31,936 million British thermal units per year (MMBtu/yr)].

The estimated hourly and annual emission rates from the flare are summarized in Appendix A, Table A-2.

3.4 CHP Engine Stack Emissions

The facility will eventually install up to two 1.6-MW biogas generators (Caterpillar Model G5320 Generator or equivalent). The estimated hourly and annual emission rates from the flare are summarized in Appendix A, Table A-3.

3.5 Total Facility Emissions

The total emissions from the facility are as follows:

Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (TPY)
Carbon Dioxide Equivalents – CO_2e	12,803	47,027
Greenhouse Gases – GHG	12,001	46,098
Carbon Dioxide – CO_2	11,960	46,052
Carbon Monoxide – CO	62.75	222.40
Nitrogen Oxides – NO_x	22.65	87.87
Volatile Organic Compounds – VOC	18.91	62.98
Methane – CH_4	40.12	46.44
Sulfur Dioxide – SO_2	37.18	24.52
Particulate Matter – PM	0.95	2.30
Ammonia – NH_3	0.21	0.94
Total Reduced Sulfur – TRS	0.56	0.97
Hydrogen Sulfide – H_2S	0.48	0.60
Total Hazardous Air Pollutants – HAPS	4.62	20.22
Formaldehyde (HAP)	4.35	19.05
Triethylamine (HAP)	0.14	0.61
Methyl Isobutyl Ketone (HAP)	0.13	0.55
Acetaldehyde (HAP)	0.00086	0.0038
Carbon Disulfide (HAP)	0.00022	0.0010
Carbonyl Sulfide (HAP)	0.00013	0.00057
Methanol (HAP)	0.000069	0.00030
Toluene (HAP)	0.000040	0.00017

4.0 STATE AND FEDERAL RULE APPLICABILITY ANALYSIS

4.1 Florida Regulations

4.1.1 Rule 62-210.200, F.A.C., Title V and Major Source Definition

Facilities that meet the definition of "Title V Source" or "Major Source of Air Pollution" must obtain a Title V operating permit. A "Title V Source" or Major Source of Air Pollution" is defined as a facility containing an emissions unit, or any group of emissions units, which is or includes any of the following:

a) *Any emissions unit or group of emissions units that emits or has the potential to emit, in the aggregate, 10 tons per year or more of any hazardous air pollutant (HAP), 25 tons per year or more of any combination of HAPs, or any lesser quantity of a HAP as established through EPA rulemaking.*

b) *An emissions unit or group of emissions units, all belonging to the same two-digit Major Group as described in the Standard Industrial Classification Manual, 1987, that directly emits or has the potential to emit, 100 tons per year or more of any regulated air pollutant.*
[...]

As shown in Section 3.0, the HP facility will have the potential to emit CO in quantities greater than 100 TPY, as well as an individual HAP (formaldehyde) in quantities greater than 10 TPY. Therefore, the HP facility will be a Title V source and will be a major source of HAP emissions.

Additionally, on May 13, 2010, the U.S. Environmental Protection Agency (EPA) established a tailoring rule for GHG emissions that established a 100,000 TPY threshold (in terms of CO_2e) for Title V permitting for GHGs. As shown in Section 3.0, emissions of GHGs from the facility are estimated to be less than 50 percent of the threshold. Therefore, the facility will not be a major source of GHG emissions.

4.1.2 Rule 62-212.400, F.A.C., Prevention of Significant Deterioration

Prevention of significant deterioration (PSD) regulations apply to facilities with the potential to emit more than 100 TPY of any regulated air pollutant, if the source is one of 28 listed source categories. In addition, PSD applies to "modifications" to existing major facilities if emissions increase by defined threshold amounts (e.g., 40 TPY for VOC, 15 TPY for PM). All estimated pollutant emissions at the facility are below the 250-TPY threshold, and the facility is not an existing major facility. Therefore, PSD regulations do not apply.

4.2 Federal Regulations

4.2.1 NSPS, 40 CFR 60, Subpart Kb – Volatile Organic Liquid Storage Vessels

New Source Performance Standards (NSPS) Subpart Kb (40 CFR 60) applies to volatile organic liquid (VOL) storage vessels that have a capacity of ≥75 m^3 (≥19,813 gallons). Also, the following storage vessels are exempt from Subpart Kb:

- Vessels with a capacity of ≥75 m^3 but <151 m^3 (39,890 gallons) storing a VOL with a maximum true vapor pressure of less than 15.0 kilopascal (kPa) [2.18 pounds per square inch absolute (psia)]
- Vessels with a capacity of ≥151 m^3 storing a VOL with a maximum true vapor pressure of less than 3.5 kPa (0.51 psia)
- All process tanks

The HP facility will not contain VOL storage tanks. Therefore, Subpart Kb will not apply to the facility.

4.2.2 NSPS, 40 CFR 60 Subpart JJJJ - Stationary Spark Ignition Internal Combustion Engines

The two generators to be located at the HP facility will be spark ignition (SI) engines subject to Subpart JJJJ. The generators will be stationary non-emergency SI engines with break horsepower ratings greater than 500 horsepower, manufactured after July 1, 2010, burning digester gas. As such, the following emission limits will apply to each engine:

- NO_x – 2.0 grams per brake horsepower per hour (g/hp-hr)
- CO – 5.0 g/hp-hr
- VOC – 1.0 g/hp-hr

Caterpillar, the manufacturer of the generators, has provided technical data sheets for the engines showing that the generators will meet these emission limits while burning digester gas (see Attachment HP-EU3-A11). The emissions estimates provided by Caterpillar are as follows:

- NO_x – 1.00 g/hp-hr
- CO – 4.78 g/hp-hr
- VOC (non-methane hydrocarbons) – 0.80 g/hp-hr

As shown, the emissions from the engines will meet the requirements of Subpart JJJJ. The HP facility will comply with all of the reporting and recordkeeping requirements contained in Subpart JJJJ.

4.2.3 NESHAP, 40 CFR 63 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

The two generators to be located at the HP facility will be reciprocating internal combustion engines (RICE) subject to Subpart ZZZZ; however, because greater than 10 percent of the gross annual heat input to the engines will be from digester gas, only the notification, monitoring, recordkeeping, and maintenance requirements of Subpart ZZZZ will apply. There are no emissions limitations or performance demonstrations required under Subpart ZZZZ.

APPENDIX A

CALCULATIONS OF EMISSIONS

Table A-1: Bioscrubber Emissions

Pollutant	Molecular Weight	Emissions Rates: Reception Zone A, B, C	Reception Tank 1	Reception Tank 2	Reception Tank 3	Digestate Management & Dryer Air	Hourly Emissions (lb/hr) [a]: Reception Zone A, B, C	Reception Tank 1	Reception Tank 2	Reception Tank 3	Digestate Management & Dryer Air	Total Hourly Emissions	Total Annual Emissions (TPY)
Criteria Pollutants													
-- Volatile Organic Compounds	--	-- --	-- --	-- --	-- --	-- --	2.96	2.00E-03	0.95	0.064	0.0062	3.98	17.45
-- Hazardous Air Pollutants	--	-- --	-- --	-- --	-- --	-- --	0.11	0	0.14	0.014	0.0013	0.27	1.17
-- Total Reduced Sulfur	--	-- --	-- --	-- --	-- --	-- --	0.085	2.29E-03	0.034	0.037	0.0021	0.16	0.70
-- Ammonia	17.031	20 ppm	50 ppm	50 ppm	100 ppm	0.005 ppm	0.15	8.88E-04	0.013	0.050	1.23E-05	0.21	0.94
Hazardous Air Pollutants													
-- Triethylamine	101.19	1.0 mg/m^3	-- --	5.02 mg/m^3	2.0 mg/m^3	-- --	0.11	--	0.019	0.01	--	0.14	0.61
-- Methyl Isobutyl Ketone	100.16	-- --	-- --	33.7 mg/m^3	-- --	-- --	--	--	0.13	--	--	0.13	0.55
-- Acetaldehyde	44.05	-- --	-- --	-- --	-- --	0.135 ppm	--	--	--	--	8.59E-04	8.59E-04	0.0038
-- Carbon Disulfide	76.139	-- --	-- --	-- --	-- --	0.020 ppm	--	--	--	--	2.20E-04	2.20E-04	0.0010
-- Carbonyl Sulfide	60.075	-- --	-- --	-- --	-- --	0.015 ppm	--	--	--	--	1.30E-04	1.30E-04	0.00057
-- Methanol	32.04	-- --	-- --	-- --	-- --	0.015 ppm	--	--	--	--	6.94E-05	6.94E-05	0.00030
-- Toluene	92.14	-- --	-- --	-- --	-- --	0.003 ppm	--	--	--	--	3.99E-05	3.99E-05	0.00017
Total Reduced Sulfur Compounds													
-- Hydrogen Sulfide	34.08	4 ppm	10 ppm	10 ppm	10 ppm	0.186 ppm	0.060	3.55E-04	0.0053	0.01	9.15E-04	0.077	0.34
-- Dimethyl Disulfide	94.2	0.3 ppm	7 ppm	7 ppm	4 ppm	0.003 ppm	0.012	6.88E-04	0.010	0.01	4.08E-05	0.035	0.15
-- Dimethyl Sulfide	62.13	0.3 ppm	10 ppm	10 ppm	5 ppm	0.002 ppm	0.0082	6.48E-04	0.010	0.01	1.79E-05	0.028	0.12
-- Methyl Mercaptan	48.11	0.2 ppm	12 ppm	12 ppm	5 ppm	0.157 ppm	0.0042	6.02E-04	0.0089	0.01	1.09E-03	0.022	0.10
Volatile Organic Compounds													
-- Butanol	74.1231	10 mg/m^3	-- --	45.6 mg/m^3	-- --	-- --	1.06	--	0.17	--	--	1.23	5.40
-- Limonene	136.24	10.5 mg/m^3	-- --	25.9 mg/m^3	-- --	-- --	1.11	--	0.10	--	--	1.21	5.31
-- Acetic Acid	60.05	5.0 mg/m^3	-- --	56 mg/m^3	-- --	-- --	0.53	--	0.21	--	--	0.74	3.24
-- Triethylamine	101.19	1.0 mg/m^3	-- --	5.0 mg/m^3	2.0 mg/m^3	-- --	0.11	--	0.019	0.01	--	0.14	0.61
-- Trimethylamine	59.11	1.0 mg/m^3	-- --	3.46 mg/m^3	1.0 mg/m^3	-- --	0.11	--	0.013	0.01	--	0.13	0.55
-- Methyl Isobutyl Ketone	100.16	-- --	-- --	33.7 mg/m^3	-- --	-- --	--	--	0.13	--	--	0.13	0.55
-- Cyclopentanol	86.13	-- --	-- --	23.5 mg/m^3	-- --	-- --	--	--	0.088	--	--	0.088	0.38
-- Propyl Butyrate	130.18	-- --	-- --	22.4 mg/m^3	-- --	-- --	--	--	0.083	--	--	0.083	0.37
-- Nonanal	142.239	-- --	-- --	12.5 mg/m^3	-- --	-- --	--	--	0.047	--	--	0.047	0.20
-- Propyl Acetate	102.13	-- --	-- --	11.2 mg/m^3	-- --	-- --	--	--	0.042	--	--	0.042	0.18
-- Dimethyl Disulfide	94.2	0.3 ppm	7 ppm	7 ppm	4 ppm	0.003 ppm	0.012	6.88E-04	0.010	0.01	4.08E-05	0.035	0.15
-- Dimethyl Sulfide	62.13	0.3 ppm	10 ppm	10 ppm	5 ppm	0.002 ppm	0.0082	6.48E-04	0.010	0.01	1.79E-05	0.028	0.12
-- Methyl Mercaptan	48.11	0.2 ppm	12 ppm	12 ppm	5 ppm	0.157 ppm	0.004	6.02E-04	0.0089	0.01	1.09E-03	0.022	0.10
-- Oleic Acid	282.4614	0.05 ppm	-- --	1 ppm	1 ppm	-- --	0.006	--	0.0044	0.01	--	0.019	0.083
-- 3-Pentanone	86.13	-- --	-- --	4.67 mg/m^3	-- --	-- --	--	--	0.017	--	--	0.017	0.076
-- Butyric Acid	88.11	0.05 ppm	-- --	2 ppm	2 ppm	-- --	0.002	--	0.0027	0.01	--	0.010	0.043
-- Ethyl Mercaptan	62.134	0.2 ppm	1 ppm	1 ppm	1 ppm	0.001 ppm	0.005	6.48E-05	0.0010	0.00	8.97E-06	0.0083	0.037
-- Alpha-Pinene	136.23	-- --	-- --	3 ppm	-- --	-- --	--	--	0.0063	--	--	0.0063	0.028
-- Isovaleraldehyde	86.13	-- --	-- --	-- --	-- --	0.186 ppm	--	--	--	--	2.31E-03	0.0023	0.010
-- Ethanol	46.07	-- --	-- --	-- --	-- --	0.157 ppm	--	--	--	--	1.04E-03	0.0010	0.0046
-- Acetaldehyde	44.05	-- --	-- --	-- --	-- --	0.135 ppm	--	--	--	--	8.59E-04	0.00086	0.0038
-- Carbon Disulfide	76.139	-- --	-- --	-- --	-- --	0.020 ppm	--	--	--	--	2.20E-04	2.20E-04	0.00096
-- Methanol	76.139	-- --	-- --	-- --	-- --	0.015 ppm	--	--	--	--	1.65E-04	1.65E-04	0.00072
-- Methane	16.04	-- --	-- --	-- --	-- --	0.057 ppm	--	--	--	--	1.32E-04	1.32E-04	0.00058
-- Carbonyl Sulfide	60.075	-- --	-- --	-- --	-- --	0.015 ppm	--	--	--	--	1.30E-04	1.30E-04	0.00057
-- Isobutyraldehyde	72.11	-- --	-- --	-- --	-- --	0.010 ppm	--	--	--	--	1.04E-04	1.04E-04	0.00046
-- Toluene	60.075	-- --	-- --	-- --	-- --	0.003 ppm	--	--	--	--	2.60E-05	2.60E-05	0.00011
-- Isopropyl Alcohol	60.1	-- --	-- --	-- --	-- --	0.001 ppm	--	--	--	--	8.68E-06	8.68E-06	0.000038

[a] Emissions based on the following air flow rates:

Reception Zone A, B, C:	28,349 acfm
Reception Tank 1:	67 acfm
Reception Tank 2:	995 acfm
Reception Tank 3:	1,892 acfm
Digestate Management & Dryer Air:	9,279 acfm
Total:	40,582 acfm

Table A-2: Emergency Flare Emissions

Pollutant	Emission Factor	Ref	Hourly Activity Factor (MMBtu/hr)	Hourly Emissions (lb/hr)	Annual Activity Factor (MMBtu/yr) [c]	Annual Emissions (TPY)
-- Carbon Dioxide Equivalents	($1*CO_2 + 21*CH_4$)	1	--	2,299	--	1,020
-- Greenhouse Gases	(sum of CO_2 & CH_4)	1	--	1,642	--	728
-- Carbon Dioxide [a]	57 % CH_4 biogas	2	36.0	1,609	31,936	714
-- Sulfur Dioxide [b]	3,000 ppmvd H_2S	5	36.0	35.14	31,936	15.59
-- Methane [a]	57 % CH_4 biogas	2	36.0	32.84	31,936	14.57
-- Carbon Monoxide	0.37 lb/MMBtu	3	36.0	13.32	31,936	5.91
-- Volatile Organic Compounds	0.14 lb/MMBtu	4	36.0	5.04	31,936	2.24
-- Nitrogen Oxides	0.08 lb/MMBtu	3	36.0	2.88	31,936	1.28
-- Particulate Matter	0.0131 lb/MMBtu	6	36.0	0.47	31,936	0.21
-- Hydrogen Sulfide [a]	3,000 ppmvd H_2S	5	36.0	0.38	31,936	0.17

[a] Assumes 98-percent destruction of CH_4 in flare.

[b] Sulfur dioxide emissions based on complete destruction of H_2S in flare.

[c] Assumes that 10-percent of biogas generated each year is combusted in the flare.

References:

1. Based on EPA GHG Tailoring Rule.
2. Based on 98-percent destruction of methane.
3. Based on flare manufacturer emissions estimates.
4. Based on AP-42, Section 13.5, Table 13.5-1.
5. Based on maximum estimated H_2S emissions from digesters, and 100-percent conversion to SO_2.
6. Based on AP-42, Table 1.4-2 for natural gas combustion. Factor is 7.6 lb/10^6 ft^3, and biogas heating value is 581.4 MMBtu/10^6 ft^3.

Table A-3: CHP Engine Emissions

Pollutant	Emission Factor	Ref	Single Engine: Hourly Activity Factor (bhp)	Single Engine: Hourly Activity Factor (MMBtu)	Single Engine: Hourly Emissions (lb/hr)	Single Engine: Annual Emissions (TPY)	Two Engines: Hourly Emissions (lb/hr)	Two Engines: Annual Emissions (TPY)
-- Carbon Dioxide Equivalents	(1*CO_2 + 21*CH_4)	1	--	--	5,252	23,004	10,504	46,007
-- Greenhouse Gases	(sum of CO_2 & CH_4)	1	--	--	5,179	22,685	10,358	45,370
-- Non-Combustion Carbon Dioxide	274.65 x 10^6 scf/yr biogas	2	--	--	1,538	6,735	3,075	13,470
-- Carbon Dioxide	736 g/bhp-hr	3	2,242	18.23	3,638	15,934	7,276	31,868
-- Carbon Monoxide [a]	5.0 g/bhp-hr	4	2,242	18.23	24.71	108.25	49.43	216.49
-- Methane	0.1 % of CO_2	3	2,242	18.23	3.64	15.93	7.28	31.87
-- Nitrogen Oxides [a]	2.0 g/bhp-hr	4	2,242	18.23	9.89	43.30	19.77	86.60
-- Volatile Organic Compounds [a]	1.0 g/bhp-hr	4	2,242	18.23	4.94	21.65	9.89	43.30
-- Formaldehyde	0.44 g/bhp-hr	3	2,242	18.23	2.17	9.53	4.35	19.05
-- Hazardous Air Pollutants	0.44 g/bhp-hr	3	2,242	18.23	2.17	9.53	4.35	19.05
-- Sulfur Dioxide	200 ppmvd H_2S	5	2,242	18.23	1.02	4.47	2.04	8.94
-- Particulate Matter	0.0131 lb/MMBtu	6	2,242	18.23	0.24	1.04	0.48	2.09
-- Hydrogen Sulfide	200 ppmvd H_2S	5	2,242	18.23	0.011	0.048	0.022	0.097

References:

1. Based on EPA GHG Tailoring Rule.
2. Based on conservative assumption that biogas is 43-percent carbon dioxide.
3. Based on engine technical data sheet provided by Caterpillar.
4. Based on NSPS limits found in 40 CFR 60 Subpart JJJJ.
5. Based on maximum estimated H_2S emissions from digesters and 98-percent conversion to SO_2.
6. Based on AP-42, Table 1.4-2 for natural gas combustion. Factor is 7.6 lb/10^6 ft^3, and biogas heating value is 581.4 MMBtu/10^6 ft^3.

Table A-4: Facility Wide Emissions

Pollutant	Hourly Emissions (lb/hr)				Annual Emissions (TPY)			
	Bio-Scrubber	Emergency Flare	CHP Engines	Total	Bio-Scrubber	Emergency Flare	CHP Engines	Total
-- Carbon Dioxide Equivalents	0.0046	2,299	10,504	12,803	--	1,019.74	46,007	47,027
-- Greenhouse Gases	0.00022	1,642	10,358	12,001	--	728.39	45,370	46,098
-- Carbon Dioxide	--	1,609	10,351	11,960	--	713.82	45,338	46,052
-- Carbon Monoxide	--	13.32	49.43	62.75	--	5.91	216.49	222.40
-- Nitrogen Oxides	--	2.88	19.77	22.65	--	1.277	86.60	87.87
-- Volatile Organic Compounds	3.98	5.04	9.89	18.91	17.45	2.236	43.30	62.98
-- Methane	0.00022	32.84	7.28	40.12	0.00096	14.57	31.87	46.44
-- Sulfur Dioxide	--	35.14	2.04	37.18	--	15.59	8.94	24.52
-- Hazardous Air Pollutants	0.27	--	4.35	4.62	1.17	--	19.05	20.22
-- Particulate Matter	--	0.47	0.48	0.95	--	0.21	2.09	2.30
-- Total Reduced Sulfur	0.16	0.38	0.022	0.56	0.70	0.17	0.097	0.97
-- Ammonia	0.21	--	--	0.21	0.94	--	--	0.94
-- Hydrogen Sulfide	0.077	0.38	0.022	0.48	0.34	0.17	0.097	0.60
Hazardous Air Pollutants								
-- Formaldehyde	--	--	4.35	4.35	--	--	19.05	19.05
-- Triethylamine	0.1391	--	--	0.14	0.609	--	--	0.61
-- Methyl Isobutyl Ketone	0.13	--	--	0.13	0.55	--	--	0.55
-- Acetaldehyde	0.00086	--	--	0.00086	0.004	--	--	0.0038
-- Carbon Disulfide	0.00022	--	--	0.00022	0.0010	--	--	0.0010
-- Carbonyl Sulfide	0.00013	--	--	0.00013	0.00057	--	--	0.00057
-- Methanol	0.000069	--	--	0.000069	0.00030	--	--	0.00030
-- Toluene	0.000040	--	--	0.000040	0.00017	--	--	0.00017

Golder Associates

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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